

Project Administration Manual

Project Number: 48409-002
Loan and Grant Numbers: LXXXX; LXXXX; and GXXXX
June 2018

Kingdom of Cambodia: Climate-Friendly Agribusiness
Value Chains Sector Project

CURRENCY EQUIVALENTS

(as of 15 May 2018)

Currency unit	–	riel/s (KR)
KR1.00	=	\$0.00025
\$1.00	=	KR4,052.18

ABBREVIATIONS

ADB	-	Asian Development Bank
ASEAN	-	Association of South East Asian Nations
CAMGAP	-	Cambodia Good Agricultural Practice
CARDI	-	Cambodia Agricultural Research and Development Institute
CSA	-	climate smart agriculture
DMC	-	Department of Multilateral Cooperation
DMF	-	design and monitoring framework
EARF	-	environmental assessment and review framework
EMDF	-	ethnic minority development framework
FWUC	-	farmer water user community
FWUG	-	farmer water user groups
GAP	-	gender action plan
GCF	-	Green Climate Fund
GDA	-	General Directorate of Agriculture
GDAHP	-	General Directorate of Animal Health and Production
GDR	-	General Department of Resettlement
GHG	-	greenhouse gas
GMO	-	genetically modified organism
GRM	-	grievance redress mechanism
ha	-	hectare
IEE	-	initial environmental examination
IMC	-	Inter-Ministerial Committee
IRC	-	Inter-Ministerial Resettlement Committee
ISO	-	International Organization for Standardization
JICA	-	Japan International Cooperation Agency
kg	-	kilogram
km	-	kilometer
LARF	-	land acquisition resettlement framework
LARP	-	land acquisition resettlement plan
MAFF	-	Ministry of Agriculture, Forestry and Fisheries
MEF	-	Ministry of Economy and Finance
MFI	-	Micro-Finance Institutions
MIH	-	Ministry of Industry and Handicraft
MOC	-	Ministry of Commerce
MOE	-	Ministry of Environment
MOWRAM	-	Ministry of Water Resources and Meteorology
MRD	-	Ministry of Rural Development
NAL	-	National Agricultural Laboratory
NBP	-	National Biodigester Program
NCB	-	national competitive bidding
O&M	-	operation and maintenance
PADC	-	Provincial Agricultural Development Center

PAM	-	project administration manual
PBL	-	Plant Biotechnology Laboratory
PDAFF	-	Provincial Department of Agriculture, Forestry and Fisheries
PDRD	-	Provincial Department of Rural Development
PDWRAM	-	Provincial Department of Water Resources and Meteorology
PIC	-	project implementation consultants
PMU	-	project management unit
PPIU	-	provincial project implementation unit
PPMS	-	project performance and monitoring system
PPP	-	public-private partnerships
PPTA	-	project preparation technical assistance
PSC	-	project steering committee
QCBS	-	quality cost-based selection
SMEs	-	small and medium-sized enterprises
SOE	-	statement of expenditures
SRP	-	sustainable rice platform
TOR	-	terms of reference
WFN	-	Women Farmer's Network

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Project Administration Manual Purpose and Process

The project administration manual (PAM) describes the essential administrative and management requirements to implement the project on time, within budget, and in accordance with the policies and procedures of the government and Asian Development Bank (ADB). The PAM should include references to all available templates and instructions either through linkages to relevant URLs or directly incorporated in the PAM.

The Ministry of Agriculture, Forestry and Fisheries (MAFF), in coordination with the Ministry of Water Resources and Meteorology (MOWRAM), and the Ministry of Rural Development (MRD), and their provincial departments are wholly responsible for the implementation of ADB-financed projects, as agreed jointly between the borrower and ADB, and in accordance with the policies and procedures of the government and ADB. ADB staff is responsible for supporting implementation, including compliance by MAFF, MOWRAM and MRD of their obligations and responsibilities for project implementation, in accordance with ADB's policies and procedures.

At loan negotiations, the borrower and ADB shall agree to the PAM and ensure consistency with the financing agreements. Such agreements shall be reflected in the minutes of the loan and grant negotiations. In the event of any discrepancy or contradiction between the PAM and the financing agreements, the provisions of the financing agreement shall prevail.

After ADB Board approval of the project's report and recommendations of the President (RRP), changes in implementation arrangements are subject to agreement and approval pursuant to relevant government and ADB administrative procedures (including the Project Administration Instructions) and upon such approval, they will be subsequently incorporated in the PAM.

I. PROJECT DESCRIPTION

1. The Climate-Friendly Agribusiness Value Chains Sector Project¹ will support the implementation of the government's Agriculture Sector Strategic Development Plan, 2014–2018² and the Industrial Development Policy, 2015–2025³ aimed at improving the competitiveness of agricultural value chains in Kampong Cham and Tboung Khmum provinces along the Greater Mekong Sub-region (GMS) southern economic corridor, and Kampot and Takeo provinces along the south-coastal economic corridor. The project will boost the climate resilience of critical agricultural infrastructure and help commercialize rice, maize, cassava, and mango production. It will help increase crop productivity and diversification; improve the capacity for storage, processing, and quality and safety testing; and promote the use of solar and bioenergy. It will strengthen the technical and institutional capacity for climate-smart agriculture (CSA) and create an enabling policy environment for climate-friendly agribusinesses. This will in turn promote long-term environmental sustainability and enhance the profitability for farmers and agribusinesses.

A. Impact and Outcome

2. The project is aligned with the following impact: agricultural competitiveness improved. The impact is reflected in enhanced productivity, climate resilience, quality and safety, value addition and rural household incomes. The project will have the following outcome: productive and resource efficient agribusiness value chains developed in the project areas.

B. Outputs

3. **Output 1: Critical agribusiness value chain infrastructure improved and made climate-resilient.** Key activities include:

- (i) Rehabilitating water management infrastructure (off-farm irrigation systems, on-farm rainwater harvesting ponds, drip irrigation) to climate resilient condition;
- (ii) Upgrading agricultural cooperative value chain infrastructure (drying, processing and storage facilities);
- (iii) Improving connectivity to cooperatives and markets through climate resilient farm road networks;
- (iv) Strengthening the infrastructure for agricultural quality and safety testing at the National Agricultural Laboratory; and
- (v) Promoting renewable energy (biodigesters and use of solar energy in target cooperative areas) for value chain improvement.

4. **Output 2: Climate-smart agriculture and agribusiness promoted.** Key activities include:

- (i) Deploying climate resilient varieties;
- (ii) Strengthening the capacity for climate friendly production practices and technologies; and
- (iii) Promoting farm mechanization and extension.

¹ The Asian Development Bank (ADB) provided project preparatory technical assistance (TA) for the *Climate-friendly Agribusiness Value Chains Sector Project* (TA 8897-REG).

² Royal Government of Cambodia. 2015. *Agriculture Sector Strategic Development Plan* (2014-2018), Phnom Penh.

³ Royal Government of Cambodia. 2015. *Industrial Development Policy* (2015-2025), Phnom Penh.

5. **Output 3: Enabling environment for climate-friendly agribusiness enhanced.** Key activities include:

- (i) Formulating climate-friendly agribusiness policies and standards;
- (ii) Promoting green finance and risk-sharing mechanisms; and
- (iii) Supporting climate risk management through information and communication technologies (ICT).

II. IMPLEMENTATION PLANS

A. Project Readiness Activities

Table 1: Project Readiness Activities

Indicative Activities	Apr	May	Jun	Jul	Aug	Sep	Oct	Responsible Agency
Establish project implementation arrangements								MAFF/MRD/MOWRAM
Request for EoI for the recruitment of consultants								MAFF
Invitation for submission of bids for the Trapaing Reservoir Irrigation Subproject								MOWRAM
Loan and grant negotiation								ADB/MEF
ADB Board approval								ADB
Signing of the Funded Activity Agreement								GCF
Loans and grant signing								ADB/MEF
Government legal opinion provided								MEF
Loan and grant effectiveness								ADB

ADB = Asian Development Bank; EoI = expression of interest; GCF = Green Climate Fund; MAFF = Ministry of Agriculture, Forestry and Fisheries; MEF = Ministry of Economy and Finance; MOWRAM = Ministry of Water and Meteorology.

Source: Asian Development Bank estimates

B. Overall Project Implementation Plan

6. Key activities of the project implementation are presented in Table 2 below. This will be updated annually and submitted to ADB with contract and disbursement projections for the following year.

Table 2: Overall Project Implementation Plan

Output and Activities	Year 1		Year 2				Year 3				Year 4				Year 5				Year 6				Year 7				Year 8	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Output 1: Critical agribusiness value chain infrastructure improved and made climate resilient																												
Activity 1.1: Rehabilitating water management infrastructure to climate resilient condition																												
Off-farm climate resilient irrigation & water management infrastructure																												
· Bid preparation for first batch subprojects																												
· Bidding, construction and handover																												
· Further Subproject identification/evaluation bidding																												
· Construction and handover of subprojects																												
On-farm water catchment ponds																												
· Selection of sites based on the approved eligibility criteria																												
· Procurement, award, construction and handover																												
Drip-irrigation demonstration sites																												
· Bid preparation for representative subproject																												
· Bidding, construction and handover																												
· Further subproject identification/evaluation bidding																												
· Construction and handover of subprojects																												
Activity 1.2: Upgrading agricultural cooperative value chain infrastructure																												
AC drying and storage unit establishment																												
· Bid preparation for representative subproject																												
· Bidding, construction and handover																												
· Further subproject identification/evaluation bidding																												
· Construction and handover of subprojects																												
Activity 1.3: Improving connectivity to cooperatives and markets through climate resilient farm road networks																												
Rural roads production zone and market access																												
· Subproject identification requiring rural roads																												
· Bidding, construction and handover																												
Activity 1.4: Strengthening infrastructure for agricultural quality and safety testing																												
NAL Plant Bio-technology Laboratory support																												
· Consultant selection and recruitment																												
· Materials & equipment procurement																												
· GMO, plant toxins & bio-fertilizer testing implemented and perfected																												
· Tissue culture protocols developed																												
· ISO 17025 capacity and compliance																												
· Laboratory commercialization implemented																												
· Rapid field testing implemented																												
Activity 1.5: Promoting renewable energy for value chain improvement																												
NBP Bio-digester program																												
· Bio-digester work plan with NBPO & PDAFFs																												
· Construction and bio-digester handover																												

[illegible]

Output and Activities	Year 1		Year 2				Year 3				Year 4				Year 5				Year 6				Year 7				Year 8	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Industrial development policy																												
• Action plan for MAFF implementation																												
Climate conscious standards development i.e. CamGAP and SRP																												
• Work plan & CAMGAP technical committee																												
• Draft Standards, consultation & NSC endorsement																												
• Linking SRP Alliance activities to project																												
• CSA activities determination																												
Activity 3.2: Promoting green finance and risk sharing mechanisms																												
Inter-ministerial committee – enabling environment for PPPs/commercial incentives & best practices																												
• Committee composition and scope determined																												
• IMC meetings																												
Crop-centric PPP forums																												
• Forum composition and scope determined																												
• Forum meetings																												
ASEAN Study tours																												
• Tour requirements and planning																												
• Study tour																												
PPP feasibility studies																												
• Study scope determined																												
• Agribusinesses identified																												
• Detailed study for green finance																												
Financial institution capacity building for climate friendly agribusiness																												
• Technical support Services (package: CS2) consultant recruitment																												
• Risk aversion awareness training & capacity building																												
• Green initiative field visits																												
• Existing initiatives review , implementation plan																												
Activity 3.3: Supporting climate risk management through information and communication technologies (ICT)																												
• Expand and extend existing ICT activities for climate smart agribusiness in Kampong Cham Province																												
Project Management Cross-Cutting Activities																												
Consultant selection procedures (aside from PIC)																												
Environment management plan key activities																												
Gender action plan key activities																												
Communication strategy key activities																												
Inception report / review mission																												
Annual Project performance report																												
Quarterly Progress Report (including financial report)																												
Twice yearly and/or midterm review																												
Government project completion report																												
Project physical completion date																												
Financial closing																												

Note: ▲ - periodic

AC = agricultural cooperatives; CAMGAP = Cambodia Good Agricultural Practice; CSA = climate smart agriculture; FWUC = farmers water user committee; GMO = genetically modified organism; HRD = Human Resource Development; ICT = information and communication technology; ISO = International Organization for Standardization; MAFF = Ministry of Agriculture, Forestry and Fisheries; MC = ? MOC = Ministry of Commerce; NAL = National Agricultural Laboratory; NBP = National Bi-digester Program; NBPO = National Biodigester Program Office; NSC = National Standards Council; PADC = Provincial Agricultural Development Center; PDAFF = Provincial Department of Agriculture, Forestry and Fisheries; PIC = project implementation consultants; PMU = project management unit; PPP = public-private partnerships; SRP = Sustainable Rice Platform.

Source: PPTA consultant

III. PROJECT MANAGEMENT ARRANGEMENTS

A. Project Implementation Organizations: Roles and Responsibilities

Table 3: Project Implementation Organization

Project Implementation Organizations	Management Roles and Responsibilities
Ministry of Economy and Finance (MEF)	<ul style="list-style-type: none"> (i) Ensure timely allocation and release of counterpart funds; (ii) Open three advance accounts, one for each funding source. (iii) With the assistance of the Financial Management Specialist from PIC (stationed in MEF), timely review of SOEs, endorsement of withdrawal application to ADB and timely release of advance funds to subaccounts in MAFF, MOWRAM and MRD; (iv) Responsible for timely submission to ADB of the consolidated audited project financial statements in accordance with ADB requirements; (v) Communicate with ADB for any amendments in the allocation of the loans and grant amount; (vi) Recruit the auditing firm acceptable to ADB to audit the consolidated project financial statements; (vii) Issues on land acquisition and resettlement will be the responsibility of the Inter-Ministerial Resettlement Council under the General Department of Resettlement.
Ministry of Agriculture, Forestry and Fisheries (MAFF) - executing agency (EA)	<ul style="list-style-type: none"> (i) Reports to the Project Steering Committee in overall supervision and guidance on implementation of the project (ii) Responsible for resolving project implementation issues to ensure effective execution of the project. It is responsible for all the activities of the project. (iii) Responsible for setting up the PSC.
Project Steering Committee (PSC)	<p>Chaired by the Minister of MAFF and vice-chaired by a MEF, with representatives from Ministry of Water Resources and Meteorology (MOWRAM), Ministry of Rural Development (MRD), Ministry of Commerce (MOC), Ministry of Industry and Handicraft (MIH) and Ministry of Environment (MOE). The PSC works throughout the duration of the project and meets at least quarterly during year 1 and semi-annually thereafter. The PSC will:</p> <ul style="list-style-type: none"> (i) ensure interagency cooperation at national level; (ii) review and advise on policy issues and implementation constraints; (iii) ensure integration with other donors and government related development activities; (iv) meet quarterly during the first year of project implementation and to at least twice a year during succeeding years. (v) monitor implementation progress; (vi) approve annual workplans and budgets; and (vii) provide overall guidance on project implementation.
Project Management Unit (PMU)	<ul style="list-style-type: none"> (i) Responsible for the day-to-day project implementation, planning and budgeting, disbursement, monitoring and reporting; (ii) Coordinate activities and report progress to PSC and ADB; (iii) Liaise with the national and provincial implementing agencies, initiate and coordinate effective communication

Project Implementation Organizations	Management Roles and Responsibilities
	<p>between all project stakeholders, and provide guidance and coordination to the implementing agencies;</p> <ul style="list-style-type: none"> (iv) Consolidate annual work plans, financial management and procurement plans including preparation of annual forecast of contract awards and disbursements; (v) Conduct monitoring and compliance of environmental and social safeguards, including gender action plan; (vi) Establish and implement project performance and monitoring system (PPMS); (vii) Open three separate subaccounts for each of the project funds; (viii) Responsible for submission of withdrawal applications through MEF, retention of supporting documents, and overseeing subaccounts; (ix) Procure civil works, goods and services, and recruit consultants following ADB's procedures; (x) Contract administration aside from irrigation and road networks; (xi) Submit progress reports, annual audited financial report, safeguard monitoring reports (including semi-annual), gender action plan and project completion report; and (xii) Conduct seminars and training for employees of MAFF on effective project management, financial management, procurement, etc.
<p>Implementing Agencies (IAs):</p> <p>Cambodia Agricultural Research and Development Institute (CARDI)</p> <p>General Directorate of Animal Health and Production (GDAHP)</p> <p>General Directorate Agriculture (GDA)</p> <p>General Department Directorate of Technical Affairs of MOWRAM</p> <p>General Directorate of Technical Affairs of MRD</p>	<ul style="list-style-type: none"> (i) Under GDA, the National Agricultural Laboratory: (a) provide laboratory equipment specifications; (b) implement GMO, plant toxin and organic fertilizer testing; (c) achieve ISO 17025 accreditation; (d) develop TC protocols; and (e) adapt procedures for partial cost recovery of services. (ii) Department of Agricultural Engineering: (a) support to provincial engineering workshops; (b) technical support to capacity and training of farm mechanization O&M, tool fabrication; and (c) promotion of engineering workshop service provision. (iii) Department of Agricultural Cooperative Promotion: (a) support to the establishment, management and operation of storage units; (b) capacity and training in agribusiness, business plan development and bookkeeping; and (c) identification and prioritization of AC for project support (infrastructure and capacity building). (iv) GDAHP will be responsible for (a) oversee the biodigester program; (b) biodigester standards development; and (c) bio-slurry utilization. (v) CARDI will be responsible for (a) climate resilient maize and rice variety development, trials, demonstrations in collaboration with IRR1; (b) seed production, multiplication and distribution, and(c) commercialization of the seed business. <p><u>General Directorate of Technical affairs of MOWRAM and MRD, responsibilities will be:</u></p> <ul style="list-style-type: none"> (i) Day-to-day project implementation, planning and budgeting, disbursement, monitoring and reporting;

Project Implementation Organizations	Management Roles and Responsibilities
	<ul style="list-style-type: none"> (ii) Establish and manage sub-accounts, submission of withdrawal applications to ADB through MEF, retention of supporting documents, and overseeing subaccounts; (iii) Coordinate activities and submit progress reports to the EA including financial data for consolidation; (iv) Elaborate annual work plans, financial management and procurement plans including preparation of annual forecasts of contract awards and disbursements; (v) Contract administration for irrigation and rural roads (farm roads); (vi) Conduct monitoring and compliance of environmental and social safeguards, including gender action plan; (vii) Implement PPMS by measuring, monitoring and evaluating the performance in delivering development impacts against established performance targets and goals of the project (viii) Carry-out administrative, technical and financial management and reporting at national level; (ix) Prepare bidding documents for civil works, goods and services, following ADB procedures to assist in project implementation related to the PMU's activities; and (x) Submission of progress reports, and financial statements for consolidation by PMU.
Provincial Project Implementation Units(PPIUs)	<ul style="list-style-type: none"> (i) Assist in the implementation of CSA to include the revision of a cropping calendar and cultivation schedule based on the improved water supply and confirm seasonal water requirements based on the existing climate data and hydrological studies; (ii) Assist in the identification of beneficiary households, under the rehabilitated irrigation system, who are interested in aggregating their land plot for laser land leveling and enhance mechanization; (iii) Assist in land leveling; (iv) Assist FWUCs to gain access to improved inputs; and (v) Assist the PMU monitoring and evaluation consultant in monitoring the impact from the subproject investments by carrying out annual impact monitoring surveys of beneficiary farmers and other value chain stakeholders. <p><u>For on-farm water management (pilot drip irrigation and water catchment ponds):</u></p> <ul style="list-style-type: none"> (i) Assist in the identification of pilot drip irrigation sites and water catchment ponds and ensure compliance with the eligibility criteria; (ii) In coordination with training advisers, develop a suite of capacity building programs related to on-farm water management, the use of water catchment ponds, climate smart agriculture, CAMGAP and sustainable rice platform as well as skills training in mechanization; (iii) Provincial Department of Agriculture, Forestry and Fisheries (PDAFF) will organize and arrange field days and training days at the site in conjunction with the private sector service provider;

Project Implementation Organizations	Management Roles and Responsibilities
	<p>(iv) PDAFF will seek guidance from the Department of Agricultural Engineering on the technical and infrastructure aspects of the pilot drip irrigation scheme and water catchment ponds;</p> <p>(v) Work with mango farmers to form a mango producer groups or a cooperative and promote joint marketing initiatives.</p> <p><u>For agricultural cooperative storage units:</u></p> <p>(i) In coordination with the project training advisers assist in the development of suitable capacity building programs related to rice, maize, cassava and mango post-harvest management and storage and agribusiness development;</p> <p>(ii) Coordinate with JICA agricultural cooperative business orientation work to ensure the training is compatible with the existing training manuals;</p> <p>(iii) PDAFF will organize and arrange open days to the cooperatives to demonstrate the work undertaken;</p> <p>(iv) PDAFF will have an oversight on the technical and infrastructure aspects of the storage unit construction;</p> <p>(v) PDAFF will seek guidance from the Department of Agricultural Cooperative Promotion on developing accountancy procedures in line with the Law on Agricultural Cooperatives.</p> <p><u>For the off-farm water management subprojects:</u></p> <p>(i) Provide necessary data (rainfall data, water basin studies etc.) and support to the design engineers;</p> <p>(ii) Review the cost estimates and the bill of quantities to ensure all items are included in the overall subproject cost estimates and that cost norms applied are adequately representative for the completion of works;</p> <p>(iii) In consultation with MOWRAM, issue technical confirmation that the design is appropriate to the local circumstances of the subproject and conforms with MOWRAM design standards;</p> <p>(iv) Respond to questions issued by the PMU on technical matters in relation to the proposed design;</p> <p>(v) Assist PMU in the procurement of and contractors to carry out the work;</p> <p>(vi) Supervise the quality assurance supervision to be performed by the consulting engineer during construction of the subproject;</p> <p>(vii) Prepare fortnightly progress reports on construction progress for submission to MOWRAM and the PMU;</p> <p>(viii) Assist in the formation of FWUCs and provide necessary training to operate and manage the irrigation system, as well as oversee the major maintenance tasks beyond the capacity of the FWUCs; and</p> <p>(ix) Prepare the annual budget to be submitted to MOWRAM for the operation and maintenance of the water management and irrigation schemes.</p> <p><u>For farm roads and cooperative storage unit market connectivity:</u></p> <p>(i) Determine the requirements for feeder farm road; improvements at each of the proposed 50 storage units to be constructed; and</p>

Project Implementation Organizations	Management Roles and Responsibilities
	<p>(ii) Identify interventions required to make the rural roads climate resilient and monitor the work to ensure quality and on-time completion.</p> <p><u>For biodigesters and biomass management:</u></p> <p>(i) Supervise and review design engineers work, and monitoring field implementation; and</p> <p>(ii) Managing capacity building activities particularly for O&M and use of compost huts and consolidating and reporting project benefits monitoring and evaluation.</p>
Asian Development Bank (ADB)	<p>(i) Monitor the progress of project implementation on a regular basis;</p> <p>(ii) Ensure that the donor fund flows to the project are achieved in a timely and efficient manner;</p> <p>(iii) Conduct review missions to examine progress and provide advice; and</p> <p>(iv) Provide oversight on the activities defined in the project in compliance with ADB procedures and financing agreement.</p>

B. Key Persons Involved in Implementation

Executing Agency

Ministry of Agriculture, Forestry and Fisheries

Part-time Project Director

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Position: Deputy Secretary General

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Full-time Project Manager

Ngin Kosal

Position: Deputy Director, Department of Agricultural Engineering

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National Technical Departments

MAFF- Department of Agricultural Cooperative Promotion

Director

Tel: 017 636464

MAFF -Department of Agricultural Engineering

Director

Tel: 012 828883

MAFF – National Agricultural Laboratory

Deputy Director General

Tel: 012 551651

MAFF – Cambodia Agricultural Research and Development Institute	Director Tel: 011 911165/023 6319692
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C. Project Organization Structure

7. MAFF is the executing agency (EA), in close coordination with MOWRAM and MRD. A project management unit (PMU) (Figure 1) will be responsible for overall project management, procurement and financial management. The PMU updates the project implementation progress to the project steering committee. Project implementation consultants (PIC) (package: CS1) will be mobilized to support MEF, MAFF, MOWRAM, MRD, and the PMU and PPIUs.

8. The General Directorate of Agriculture, CARDI, GDAHP, the General Directorate of Technical Affairs of MOWRAM and the General Directorate of Technical Affairs of MRD will be the implementing agencies (IAs).

9. As strengthening the competitiveness of agricultural value chains will require cooperation from multiple institutions. At provincial level, the PD AFF, PDWRAM and Provincial Department of Rural Development (PDRD) will be key agencies working with guidance and technical support from relevant national departments. A provincial project implementation unit (PPIU) will be established in each of the four targeted provinces. The PPIU will be chaired by the director of PD AFF, and comprising representatives of PDWRAM and PDRD, and PD AFF staff related to cooperatives, agricultural extension, and animal health and production. PDWRAMs will be responsible for coordinating all field activities with FWUCs, while PDRDs will be responsible for

all farm roads and connectivity to agricultural cooperatives (see Figure 2). Detailed terms of reference for the PMU and PPIU staff is in Annex 6.

10. A public-private partnership inter-ministerial committee (PPP IMC) will be formed and chaired by MEF and will have a maximum of 10 representatives solely to review potential PPP agribusiness projects and will meet once every two months. The private sector related to the value chains will have an input through the business forums, federations and associations that will provide feedback and information to the proposed PPP IMC and on to the steering committee. The forums, federations and associations can circumvent the IMC for non-PPP initiatives.

11. The CSA policy activity will be led by the working group that comprises representatives from MAFF, MEF, MOC, MIH and MOE. As MEF is the EA of ADB's Rice Commercialization project which has sponsored a feasibility study on how best to approach and implement crop insurance activities, MEF will also be providing assistance in the crop insurance initiative as well as the green finance initiatives. MEF is also working on and being supported by ADB on PPP initiatives.

12. CARDI and the International Rice Research Institute (IRRI) will be responsible for the climate resilient variety development activities, but field demonstrations and trials will include full coordination with PDARR.

13. PIC and other technical specialists as well as service providers including government staff as resource persons will carry out a range of capacity building, training activities, pilot demonstrations and detailed engineering designs.

14. The project steering committee (see Figure 3), chaired by the Minister of MAFF, vice-chaired by MEF with representatives (at the level of Under Secretary of State or above) of MOWRAM, MRD, MOC, MIH and MOE, will provide oversight, coordination and policy guidance in all aspects of project implementation, except land acquisition and resettlement which is the responsibility of the Inter-Ministerial Resettlement Committee (IRC). Other ministries may be invited to attend as observers when specific issues of their concern are for discussion. To make decisions quickly, it is recommended that the various steering committee members will be at least the rank of director general. The steering committee may invite persons and agencies to discuss specific agenda items, when required. For effective decision making, no more than 20 persons shall attend at any one meeting. The project steering committee will meet quarterly during the first year of the project implementation and semi-annually for subsequent years.

Figure 1: Project Management Unit

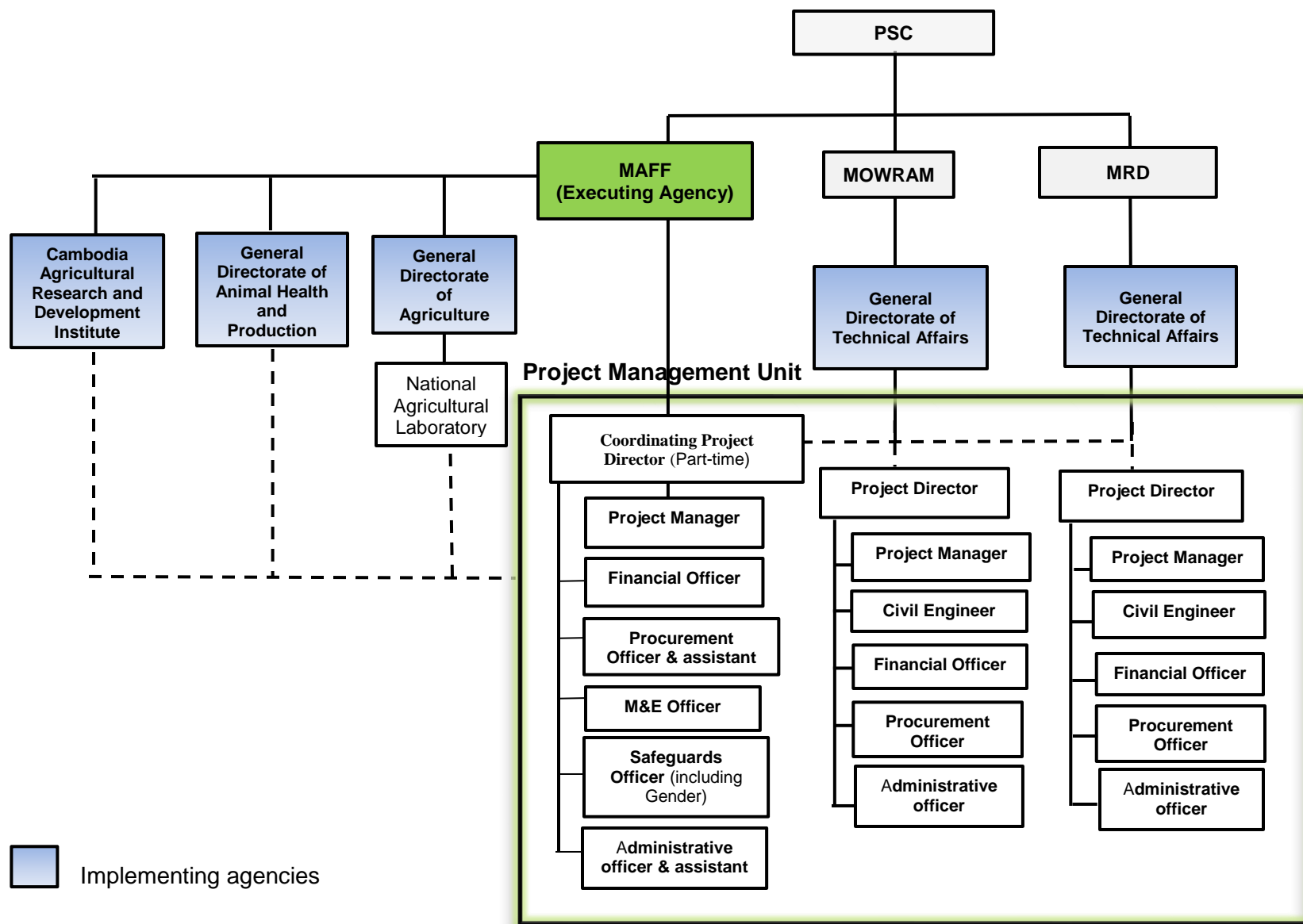


Figure 2: Provincial Project Implementation Units – per province

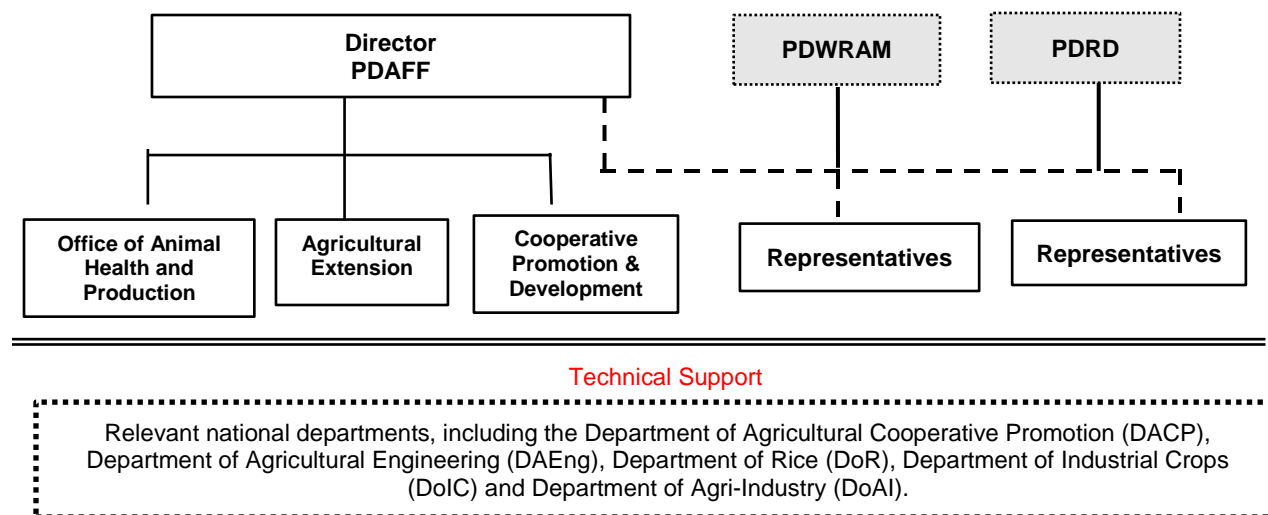
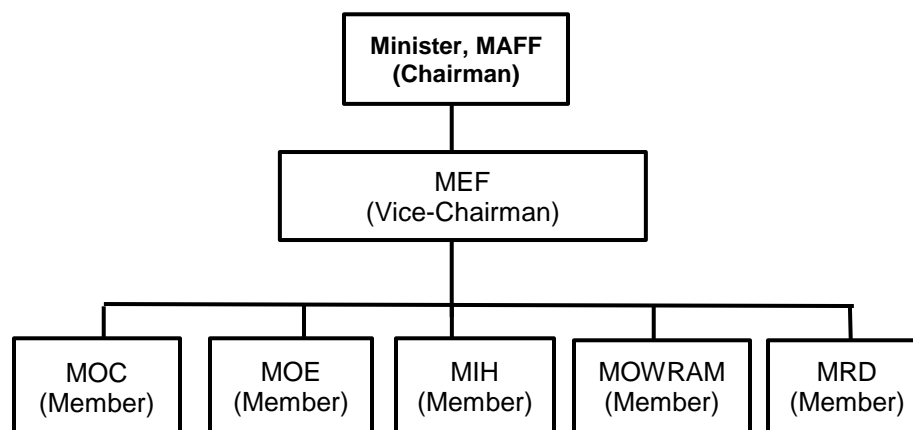


Figure 3: Project Steering Committee



*Members will be at the level of Under Secretary of State or above.

**Other ministries may be invited to attend as observers when specific issues of their concern are for discussion.

IV. COSTS AND FINANCING

15. The total project cost is estimated at \$141.04 million. The government has requested a (i) concessional loan of \$90 million from ADB's ordinary capital resources, and (ii) loan of \$10 million and a grant of \$30 million from the Green Climate Fund (GCF) to be administered by ADB on a cost sharing basis, to help finance the project.

16. ADB loan will have a 32-year term, including a grace period of 8 years; an interest rate of 1.0% per year during the grace period and 1.5% per year thereafter; and such other terms and conditions set forth in the draft loan agreement. GCF loan will have a 32-year term, including a grace period of 8 years; a service charge of 0.25% per year; and such other terms and conditions set forth in the draft GCF loan agreement.

17. The ADB loan and ADB-administered loan and grant proceeds will finance (i) civil works; (ii) equipment and materials; (iii) studies, surveys and design; (iv) training and demonstration; (v) policies and standards; (vi) monitoring and evaluation; (vii) consulting services; (viii) information and communication technology; and (ix) incremental operating costs. The government will also borrow for financing charges during implementation. ADB and GCF will finance taxes and duties for civil works, trainings and portion of incremental operating cost.

18. The government will provide the equivalent of \$7.38 million to (i) finance biogas plants and composts huts; (i) pay salaries of government staff working for the project; (iii) cover cost of land acquisition and resettlement; (iv) monitor (including external monitoring for safeguards and external audit), and (v) pay taxes and duties for goods, equipment, materials, surveys and services through exemption. Contribution from the beneficiaries of \$3.66 million equivalent can be in-kind or in cash for the biogas plant, and compost huts.

A. Cost Estimates Preparation and Revisions

19. The project team prepared the cost estimates using data collected by individual specialists from primary and secondary sources. During project implementation, project staff and project implementation team will revise costs in accordance with detailed final designs and will also be responsible for detailed costing of additional water resources and cooperative value chain infrastructure subprojects implemented as part of the project. Tables may be revised during midterm review or special administration review mission.

B. Key Assumptions

20. The following key assumptions underpin the cost estimates and financing plan:

- (i) Exchange rate: KR3,964.58 = \$1.00 (as of 30 March 2018).
- (ii) Price contingencies based on expected cumulative inflation over the implementation period are as follows:

Table 4: Escalation Rates for Price Contingency Calculation

Item	2019	2020	2021	2022	2023	2024	Average
Foreign rate of price inflation	1.5%	1.5%	1.6%	1.6%	1.6%	1.6%	1.6%
Domestic rate of price inflation	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%

Source: Asian Development Bank estimates.

C. Detailed Cost Estimates by Expenditure Category

Table 5: Detailed Cost Estimates by Expenditure Category
(\$ million)

	\$ million			% of Total Base Cost
	Local Currency	Foreign Exchange	Total Cost ^a	
A. Investment Costs^b				
1. Civil Works	76.58	3.24	79.82	67.0%
2. Equipment				
Equipment - Cooperative, Laboratories and Others	2.28	2.33	4.61	3.9%
Equipment – ICT	1.04	1.93	2.97	2.5%
3. Vehicles	0.52	0.33	0.85	0.7%
4. Material and Supplies	1.09	0.63	1.72	1.4%
5. Studies & Surveys	1.31	0.00	1.31	1.1%
6. Training, Workshops & Demonstrations	6.57	0.02	6.59	5.5%
7. Policies & Standards	0.70	0.01	0.71	0.6%
8. Monitoring & Evaluation	1.26	0.00	1.26	1.1%
9. Consulting Services				
Consulting Services - ADB ^c	6.74	2.70	9.44	7.9%
Consulting Services - GCF ^d	3.91	0.00	3.91	3.3%
10. Incremental Operating Cost				
Project Staff	2.77	0.00	2.77	2.3%
Climate Risk Sharing Support	0.44	0.00	0.44	0.4%
Office Operations & Support Costs	0.95	0.00	0.95	0.8%
Government Contribution	1.86	0.00	1.86	1.6%
Subtotal (A)	108.02	11.19	119.20	100.0%
B. Contingencies				
1. Physical ^e	9.12	0.79	9.91	8.3%
2. Price ^f	9.65	0.82	10.47	8.8%
Subtotal (B)	18.77	1.60	20.38	17.1%
C. Financial Charges During Implementation				
1. Interest during construction ^g	0.00	1.46	1.46	1.2%
Subtotal (C)	0.00	1.46	1.46	1.2%
Total Project Cost	126.79	14.25	141.04	118.3%

Notes: Numbers may not sum precisely because of rounding.

^a Includes taxes and duties of \$11.71 million. \$9.37 million to be financed by ADB and GCF for civil works, training, and incremental operating cost financed by the project; and \$2.34 million to be financed by the government for goods, equipment, incremental operating costs and services through tax exemption.

^b In first quarter 2018 prices.

^c Include consulting services for: (i) feasibility study and detailed engineering design; (ii) capacity building and climate smart agribusiness; and (iii) project implementation.

^d Include consulting services for: (i) climate resilient variety deployment; and (ii) information and communication technology.

^e Physical contingencies computed at 10% for civil works and equipment, 0% for consulting services, and 5% for the other expenditure categories.

^f Price contingencies on foreign currency costs computed at 1.5% from 2018 to 2020 and 1.6% thereafter. Price contingencies on local currency costs computed at 3.2% for 2018 and 3.5% from 2019 to 2024; include provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.

^g Interest during construction for ADB and GCF loans has been computed at 1.0% and 0.25% respectively, per year.

Source: Asian Development Bank estimates

D. Allocation and Withdrawal of Loans and Grant Proceeds

Table 6.1: Allocation of ADB Loan Proceeds

No.	Expenditure Item	Total Amount Allocated for ADB Financing (\$)		Basis for Withdrawal from the Loan Account
		Category	Subcategory	
1	Civil Works	67,630,590		
1A	Irrigation and Roads		60,537,190	76.8% of total expenditure claimed
1B	Warehouses and Laboratory		5,762,800	100% of total expenditure claimed
1C	Other Infrastructure		1,330,600	92.1% of total expenditure claimed
2	Equipment, Materials, Goods, and Project Implementation Services	16,757,700		100% of total expenditure claimed*
3	Incremental operating cost	4,187,100		100% of total expenditure claimed
4	Interest Charges	1,424,610		100% of amount due
	Total	90,000,000		

Notes: Totals including contingencies.

: Incremental operating cost refers to project staff, office operations & support costs.

*Exclusive of taxes and duties.

Table 6.2: Allocation of GCF Loan Proceeds

No.	Expenditure Item	Total Amount Allocated for GCF Financing (\$) Category	Basis for Withdrawal from the Loan Account
1	Civil Works - Irrigation and Roads	9,963,900	12.7% of total expenditure claimed
2	Service Charge	36,100	100% of amount due
	Total	10,000,000	

Note: Totals including contingencies.

Table 6.3: Allocation of GCF Grant Proceeds

No.	Expenditure Item	Total Amount Allocated for GCF Financing (\$)		Basis for Withdrawal from the Grant Account
		Category	Subcategory	
1	Civil Works	11,263,860		
1A	Irrigation and Roads		8,295,660	10.5% of total expenditure claimed
1B	Other Infrastructure		114,050	7.9% of total expenditure claimed
1C	Biogas Plants and Compost Huts		2,854,150	100% of total expenditure claimed
2	Equipment, Studies, Surveys, and Project Implementation Services	10,785,430		100% of total expenditure claimed*
3	Trainings, Workshops and Demonstration	7,456,780		100% of total expenditure claimed
4	Incremental operating cost	493,930		100% of total expenditure claimed
	Total	30,000,000		

Notes: Totals including contingencies.

: Incremental operating cost refers to climate risk sharing support.

*Exclusive of taxes and duties.

E. Detailed Cost Estimates by Financier

Table 7: Detailed Cost Estimates by Financier
(\$ millions)

	ADB Loan		GCF Loan		GCF Grant		Beneficiaries		The Government		Total Cost	Duties & Taxes		
	Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category		ADB & GCF	Govt	Total
A. Investment Costs														
1. Civil Works														
Water & Irrigation	31.84	76.8%	5.24	12.7%	4.36	10.5%	-	0.0%	-	0.0%	41.45	3.73	-	3.73
Rural Connector Roads	28.69	76.8%	4.72	12.7%	3.93	10.5%	-	0.0%	-	0.0%	37.35	3.36	-	3.36
Storage Warehouses	5.76	100.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	5.76	0.52	-	0.52
Other Infrastructure	1.33	92.1%	-	0.0%	0.11	7.9%	-	0.0%	-	0.0%	1.44	0.13	-	0.13
Biogas Plants and Compost Huts ^a	-	0.0%	-	0.0%	2.85	30.8%	3.66	39.5%	2.76	29.7%	9.28	0.83	-	0.83
2. Equipment														
Equipment - Cooperative, Laboratories and Others	4.41	81.7%	-	0.0%	-	0.0%	-	0.0%	0.98	18.3%	5.39	-	0.98	0.98
Equipment - ICT	-	0.0%	-	0.0%	3.19	91.0%	-	0.0%	0.32	9.0%	3.50	-	0.32	0.32
3. Vehicles	0.46	52.1%	-	0.0%	-	0.0%	-	0.0%	0.43	47.9%	0.89	-	0.43	0.43
4. Materials & Supplies	1.62	84.4%	-	0.0%	-	0.0%	-	0.0%	0.30	15.6%	1.91	-	0.30	0.30
5. Studies & Surveys	-	0.0%	-	0.0%	1.17	91.0%	-	0.0%	0.12	9.0%	1.29	-	0.12	0.12
6. Training, Workshops & Demonstrations	-	0.0%	-	0.0%	7.46	100.0%	-	0.0%	-	0.0%	7.46	0.67	-	0.67
7. Policies & Standards	-	0.0%	-	0.0%	0.72	91.0%	-	0.0%	0.07	9.0%	0.79	-	0.07	0.07
8. Monitoring & Evaluation	-	0.0%	-	0.0%	1.30	91.0%	-	0.0%	0.13	9.0%	1.42	-	0.13	0.13
9. Consulting Services														
PIC - FS & Detailed Engineering Design	2.62	100.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	2.62	-	-	-
PIC - Capacity Building and CSA Consultants	3.27	100.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	3.27	-	-	-
PIC - Project Management	4.38	100.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	4.38	-	-	-
PIC - Variety Development	-	0.0%	-	0.0%	2.79	100.0%	-	0.0%	-	0.0%	2.79	-	-	-
PIC - ICT	-	0.0%	-	0.0%	1.62	100.0%	-	0.0%	-	0.0%	1.62	-	-	-
10. Incremental Operating Costs														
Project Staff	3.12	100.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	3.12	-	-	-
Climate Risk Sharing Support	-	0.0%	-	0.0%	0.49	100.0%	-	0.0%	-	0.0%	0.49	0.04	-	0.04
Office Operations & Support Costs	1.06	100.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	1.06	0.08	-	0.08
Government Contribution ^b	-	0.0%	-	0.0%	-	0.0%	-	0.0%	2.28	100.0%	2.28	-	-	-
Total Base Costs (A)	88.58	63.5%	9.96	7.1%	30.00	21.5%	3.66	2.6%	7.38	5.3%	139.58	9.37	2.34	11.71
B. Financing Charges During Implementation	1.42	97.5%	0.04	2.5%	-	0.0%	-	0.0%	-	0.0%	1.46	-	-	-
Total Project Cost (A+B)	90.00	63.8%	10.00	7.1%	30.00	21.3%	3.66	2.6%	7.38	5.2%	141.04	9.37	2.34	11.71

Note: Numbers may not sum precisely because of rounding.

^a Project will support a fixed amount of \$150 for the biogas plants and \$100 for compost huts. The government will provide parallel subsidy through biodigester programs. The contribution from beneficiaries can be in kind or in cash.

^b Includes staff salaries, office space, utilities, and land acquisition and resettlement costs, if any

Source: Asian Development Bank estimates.

F. Detailed Cost Estimates by Outputs

Table 8: Cost Estimates by Outputs
(\$ million)

	Output 1		Output 2		Output 3		Project Management		Total Cost
	Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category	
A. Investment Costs									
1. Civil Works									
Water & Irrigation	34.75	100.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	34.75
Rural Connector Roads	31.17	100.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	31.17
Storage Warehouses	4.85	100.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	4.85
Other Infrastructure	0.07	5.5%	0.96	76.9%	0.22	17.6%	0.00	0.0%	1.25
Biogas Plants and compost huts	7.80	100.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	7.80
2. Equipment									
Equipment - Cooperative, Laboratories & Others	4.03	84.5%	0.59	12.7%	0.00	0.0%	0.00	0.0%	4.61
Equipment – ICT	0.00	0.0%	0.00	0.0%	2.97	100.0%	0.00	0.0%	2.97
3. Vehicles	0.56	65.8%	0.16	19.2%	0.00	0.0%	0.13	15.0%	0.85
4. Materials & Supplies	1.72	99.9%	0.00	0.1%	0.00	0.0%	0.00	0.0%	1.72
5. Studies & Surveys	0.25	21.6%	0.36	31.5%	0.54	46.9%	0.00	0.0%	1.15
6. Training, Workshops & Demonstrations	1.09	16.5%	5.15	78.2%	0.35	5.3%	0.00	0.0%	6.59
7. Policies & Standards	0.00	0.0%	0.00	0.0%	0.71	100.0%	0.00	0.0%	0.71
8. Monitoring & Evaluation	1.06	84.1%	0.00	0.0%	0.00	0.0%	0.20	15.9%	1.26
9. Consulting Services									
PIC - FS & Detailed Engineering Design	2.29	99.3%	0.02	0.7%	0.00	0.0%	0.00	0.0%	2.30
PIC - Capacity Building and CSA Consultants	0.99	32.3%	1.34	43.8%	0.73	23.8%	0.00	0.0%	3.06
PIC - Project Management	0.00	0.0%	0.00	0.0%	0.00	0.0%	4.09	100.0%	4.09
PIC - Variety Development	0.00	0.0%	2.46	100.0%	0.00	0.0%	0.00	0.0%	2.46
PIC – ICT	0.00	0.0%	0.00	0.0%	1.45	100.0%	1.19	82.2%	1.45
10. Incremental Operation Cost									
Project Staff	2.77	100.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	2.77
Climate Risk Sharing Support	0.00	0.0%	0.00	0.0%	0.44	100.0%	0.00	0.0%	0.44
Office Operations & Support Costs	0.15	16.1%	0.22	23.5%	0.00	0.0%	0.57	60.4%	0.95
Government Contribution	0.04	2.1%	0.12	6.1%	0.00	0.0%	1.85	91.8%	2.02
Total Base Cost	93.58	78.5%	11.39	9.6%	7.39	6.2%	6.84	5.7%	119.20
B. Contingencies									
1. Physical	8.73	88.2%	0.57	5.8%	0.49	4.9%	0.11	1.2%	9.91
2. Price	8.53	81.5%	0.85	8.2%	0.57	5.4%	0.51	4.9%	10.47
Total Contingencies	17.27	84.7%	1.43	7.0%	1.06	5.2%	0.63	3.1%	20.38
C. Financing Charges During Implementation	1.16	79.4%	0.13	9.2%	0.09	6.1%	0.08	5.3%	1.46
Total Project Cost (A+B+C)	112.01	79.4%	12.95	9.2%	8.54	6.1%	7.54	5.3%	141.04

Source: Asian Development Bank estimates.

G. Detailed Cost Estimates by Year

Table 9: Detailed Cost Estimates by Year
(\$ million)

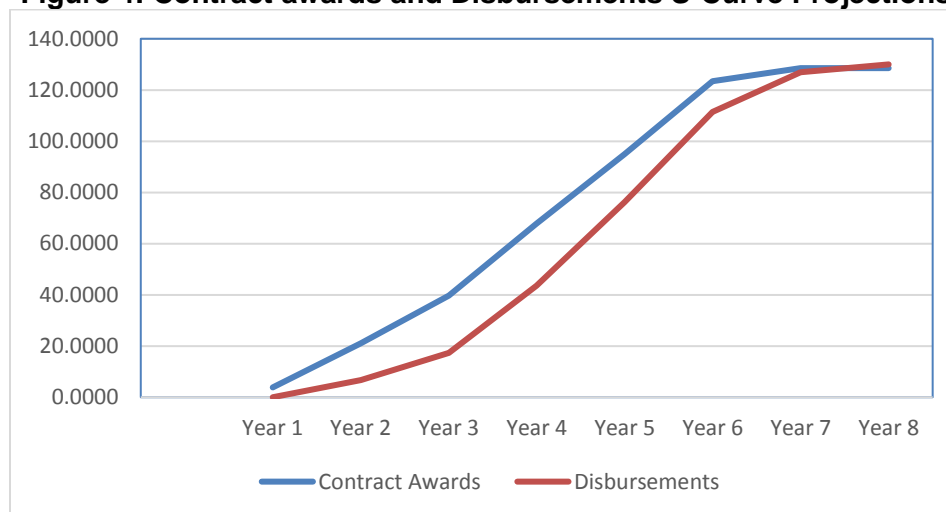
Item	Year 1 ^a	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Total
I. Investment Costs								
1. Civil Works								
Water & Irrigation	0.00	0.38	3.29	9.42	10.63	6.82	4.21	34.75
Rural Connector Roads	0.00	0.00	2.87	5.08	9.31	9.51	4.39	31.17
Storage Warehouses	0.00	0.21	1.05	1.05	1.05	1.05	0.45	4.85
Other Infrastructure	0.00	0.21	0.97	0.08	0.00	0.00	0.00	1.25
Biogas Plants and Compost Huts	0.00	1.06	1.17	1.22	1.33	1.46	1.56	7.80
Subtotal – Civil Works	0.00	1.87	9.34	16.85	22.32	18.83	10.62	79.82
2. Equipment								
Equipment - Cooperative, Laboratories & Others	0.00	0.79	2.40	0.44	0.44	0.44	0.27	4.77
Equipment – ICT	0.00	0.60	0.67	0.41	0.41	0.43	0.43	2.97
3. Vehicles	0.00	0.37	0.49	0.00	0.00	0.00	0.00	0.85
4. Materials & Supplies	0.00	0.33	0.91	0.17	0.17	0.07	0.07	1.72
5. Studies & Surveys	0.00	0.41	0.26	0.11	0.15	0.11	0.12	1.15
6. Training, Workshops & Demonstrations	0.00	0.12	1.68	1.74	1.26	1.19	0.60	6.59
7. Policies & Standards	0.00	0.00	0.30	0.24	0.11	0.02	0.02	0.71
8. Monitoring & Evaluation	0.00	0.18	0.20	0.20	0.21	0.23	0.24	1.26
9. Consulting Services								
PIC –FS & Detailed Engineering Design	0.00	0.03	0.23	0.51	0.71	0.56	0.25	2.30
PIC – Capacity Building & CSA Consultants	0.00	0.42	0.90	0.73	0.41	0.33	0.26	3.06
PIC – Project Management	0.00	0.99	0.69	0.70	0.63	0.59	0.50	4.09
PIC – Variety Development	0.00	0.16	0.52	0.52	0.49	0.46	0.30	2.46
PIC – ICT	0.00	0.27	0.32	0.24	0.20	0.22	0.20	1.45
Subtotal - PIC	0.00	1.67	2.47	2.50	2.24	1.97	1.31	13.35
10. Incremental Operating Cost								
Project Staff	0.00	0.23	1.13	0.32	0.36	0.38	0.34	2.77
Climate Risk Sharing Support	0.00	0.00	0.11	0.11	0.11	0.11	0.00	0.44
Office Operations & Support Costs	0.00	0.15	0.16	0.16	0.16	0.16	0.17	0.95
Government Contribution	0.00	0.28	0.30	0.30	0.30	0.30	0.37	1.86
Total Base Cost	0.00	7.19	20.61	23.75	28.45	24.44	14.76	119.20
II. Contingencies								
A. Physical	0.00	0.43	1.54	2.00	2.52	2.16	1.26	9.91
B. Price	0.00	0.28	1.16	1.76	2.63	2.72	1.92	10.47
Total Contingencies	0.00	0.71	2.70	3.75	5.15	4.87	3.19	20.38
III. Interest During Implementation	0.00	0.02	0.09	0.18	0.30	0.40	0.46	1.46
Total Project Cost (I + II + III)	0.00	7.92	23.41	27.69	33.91	29.71	18.41	141.04
% Total Project Cost	0.0%	5.6%	16.6%	19.6%	24.0%	21.1%	13.1%	100.0%

^a Estimated project effectiveness in Q4 of Year 1.

Source: Asian Development Bank estimates.

H. Contract and Disbursement S-Curves

Figure 4: Contract awards and Disbursements S-Curve Projections



Total Proceeds

	Contract Awards					Disbursements				
	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
Year 1				3.8464	3.8464				0.0000	0.0000
Year 2	0.0000	4.2730	3.2497	9.6719	17.1947	0.0000	0.0000	4.5000	2.2120	6.7120
Year 3	0.0302	3.6752	13.2070	1.7907	18.7031	0.0000	1.0000	1.0000	8.6177	10.6177
Year 4	0.0000	14.1685	11.3593	2.5699	28.0976	0.0000	5.0000	5.0000	16.2104	26.2104
Year 5	0.0000	13.1440	11.9292	2.0000	27.0732	1.5000	6.0000	6.0000	19.1960	32.6960
Year 6	0.0000	13.1440	12.7893	2.5699	28.5032	5.0000	6.0000	6.0000	18.2629	35.2629
Year 7	0.0000	4.2753	0.8459		5.1212	0.0000	5.0000	5.0000	5.5010	15.5010
Year 8					0.0000	2.0000	0.0000	1.0000	0.0000	3.0000
Totals					128.5393					130.0000

IDC 1.4607

ADB Loan Proceeds

	Contract Awards					Disbursements				
	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
Year 1				3.8464	3.8464				0.0000	0.0000
Year 2	0.0000	1.4030	3.2497	4.9087	9.5614	0.0000	0.0000	4.5000	0.0000	4.5000
Year 3	0.0302	3.6752	7.6917	1.5278	12.9248	0.0000	1.0000	1.0000	2.0000	4.0000
Year 4	0.0000	11.1220	9.2708	0.0000	20.3928	0.0000	5.0000	5.0000	8.0000	18.0000
Year 5	0.0000	10.0975	9.2708	0.0000	19.3683	1.5000	6.0000	6.0000	10.0000	23.5000
Year 6	0.0000	10.0975	9.2708	0.0000	19.3683	5.0000	6.0000	6.0000	10.0000	27.0000
Year 7	0.0000	3.1134	0.0000		3.1134	0.0000	5.0000	5.0000	0.0000	10.0000
Year 8					0.0000	2.0000	0.0000	1.0000		3.0000
Totals					88.5754					90.0000

IDC 1.4246

GCF Grant Proceeds

Contract Awards						Disbursements					
	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total	
Year 1				0.0000	0.0000				0.0000	0.0000	
Year 2	0.0000	2.7582	0.0000	4.7632	7.5214	0.0000	0.0000	0.0000	2.1520	2.1520	
Year 3	0.0000	0.0000	4.3756	0.1194	4.4951	0.0000	0.0000	0.0000	5.6307	5.6307	
Year 4	0.0000	1.3839	0.9487	2.5699	4.9026	0.0000	0.0000	0.0000	6.1094	6.1094	
Year 5	0.0000	1.3839	1.5186	2.0000	4.9026	0.0000	0.0000	0.0000	6.2300	6.2300	
Year 6	0.0000	1.3839	2.3787	2.5699	6.3326	0.0000	0.0000	0.0000	5.7809	5.7809	
Year 7	0.0000	1.0000	0.8459		1.8459	0.0000	0.0000	0.0000	4.0970	4.0970	
Year 8					0.0000	0.0000	0.0000	0.0000		0.0000	
Totals					30.0000	Totals					30.0000

IDC

0

GCF Loan Proceeds

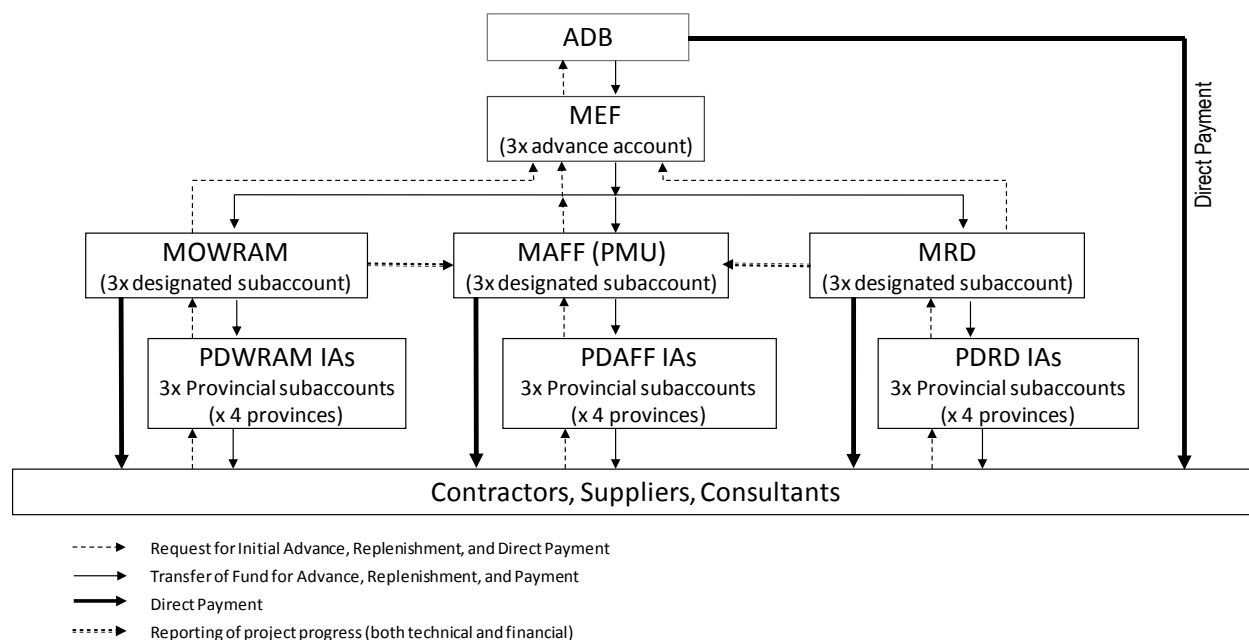
Contract Awards						Disbursements					
	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total	
Year 1				0.0000	0.0000				0.0000	0.0000	
Year 2	0.0000	0.1119	0.0000	0.0000	0.1119	0.0000	0.0000	0.0000	0.0600	0.0600	
Year 3	0.0000	0.0000	1.1397	0.1435	1.2832	0.0000	0.0000	0.0000	0.9870	0.9870	
Year 4	0.0000	1.6625	1.1397	0.0000	2.8023	0.0000	0.0000	0.0000	2.1010	2.1010	
Year 5	0.0000	1.6625	1.1397	0.0000	2.8023	0.0000	0.0000	0.0000	2.9660	2.9660	
Year 6	0.0000	1.6625	1.1397	0.0000	2.8023	0.0000	0.0000	0.0000	2.4820	2.4820	
Year 7	0.0000	0.1619	0.0000		0.1619	0.0000	0.0000	0.0000	1.4040	1.4040	
Year 8					0.0000	0.0000	0.0000	0.0000		0.0000	
Totals					9.9639	Totals					10.0000

IDC

0.0361

I. Fund Flow Diagram

Figure 5: Fund Flow Arrangements



Note: Service standards for reporting of financial transactions by all three implementing agencies should be adhered to.

ADB = Asian Development Bank; EA = executive agency; IA = implementing agency; MEF= Ministry of Economy and Finance; MAFF = Ministry of Agriculture, Forestry and Fisheries; MOWRAM = Ministry of Water Resources and Meteorology; MRD = Ministry of Rural Development; NBC = National Bank of Cambodia; PDAFF = Provincial Department of Agriculture, Forestry and Fisheries; PDWRAM = Provincial Department of Water Resources and Meteorology; PDRD = Provincial Department of Rural Development; PMU = project management unit.

Note: For payments to contractors over \$100,000, direct payment may be paid by ADB. Same fund flow diagram for GCF loan and grant.

V. FINANCIAL MANAGEMENT

A. Financial Management Assessment

21. The financial management assessment (FMA) was conducted in July and August 2016 in accordance with ADB's Guidelines for the Financial Management and Analysis of Projects, and the Financial Due Diligence A Methodology Note. The FMA assessed the capacity of MAFF as the executing agency and the provincial offices of MAFF, MOWRAM and MRD in the four project provinces, as implementing agencies including funds flow arrangements, staffing, accounting and financial reporting systems, financial information systems, and internal and external auditing arrangements. Based on the assessment, the key financial management risks identified are (i) needs improvements in control of budget execution; accounting and reporting, and budget credibility; (ii) limited financial management capacity of the public-sector institutions; (iii) transfer of responsibilities for budget management from MEF to line ministries, including the rolling out of the Financial Management Information System; and (iv) transfer of functions and resources to sub-national administrations (SNAs). Uncertainty, delays in the delegation of functions, and inadequate delegation will postpone the buildup of capacity in SNAs; and (v) quality of both internal and external audit reports is improving but remains a concern. It is concluded that the overall pre-mitigation financial management risk of the executing and implementing agencies is moderate. The MEF has capacity to administer the advance fund and implement SOE procedures. The borrower, executing and implementing agencies have agreed to implement an action plan as key measures to address the deficiencies. The financial management action plan is provided in Table 10.

Table 10: Time-Bound Action Plan

Weakness	Mitigation Action	Responsibility	Timeframe
<ul style="list-style-type: none"> Coordination among PMU of MAFF as EA and IAs: PDAFF, PDWRAM, PDRD, and others 	<ul style="list-style-type: none"> Clear roles and responsibilities are detailed in PAM. EA and IAs are well informed about their roles and responsibilities by ADB and PIC. 	EA/PMU/MEF	One month after Loan Negotiation.
<ul style="list-style-type: none"> Limited capacity of the project staff at the PMU/PPIU on budget execution, accounting, reporting and auditing. 	<ul style="list-style-type: none"> Four national Financial Management Specialists will be recruited to provide financial management support to the PMU. In collaboration with CARM, they will train accountants of EA/IA on budget execution, accounting, reporting, and auditing. Training on project management, financial management, SOP and project fund flows shall be provided to the project staff in EA and IAs. Training on ADB disbursement procedures, including online training, will be made available to EA and IA staff; and project staff will be encouraged to undertake the training to help ensure efficient disbursement and fiduciary control. 	MAFF / PMU / PIC	Starting 3 months from project effectiveness and will be a continuing activity to ensure staff are updated of the latest good practice.

Weakness	Mitigation Action	Responsibility	Timeframe
<ul style="list-style-type: none"> Safeguard of vehicles, motorcycles, equipment for workshops, laboratory, and solar power 	<ul style="list-style-type: none"> Inventory List must be set up with accountability. A sound inventory management is required via trainings for IAs. 	PMU/PIC	3 months from the mobilization of the PIC.
<ul style="list-style-type: none"> Most proposed IAs/PPIUs do not have accounting system to record financial transactions and prepare the required financial reports. 	<ul style="list-style-type: none"> The accounting system shall be set up and training will be provided for the project accountants at PPIUs/IAs 	PMU/PIC	3 months from the mobilization of the PIC.
<ul style="list-style-type: none"> Limited capacity in internal audit. Quality of both internal and external audit reports remains a concern. 	<ul style="list-style-type: none"> MEF will ensure that each IA will include qualified accountants and auditors, and ensure that the project is subject to internal audit to ensure that the Internal Audit Unit of each IA carries out regular reviews of the internal control processes. Regular training on audit will be provided. 	MEF/ADB	By end of Year 1.
<ul style="list-style-type: none"> Delays and incomplete submission of the unaudited annual project financial statements 	<ul style="list-style-type: none"> EA and IAs staff will be trained in preparing and submitting quality reports of annual project financial statements on a timely basis. MEF to update the TOR for auditors and explore potential participation of supreme audit intuition to further improve quality. 	MEF/ADB	By the 9 th month from the project effectiveness.

ADB=Asian Development Bank; EA = executing agency; IA= implementing agency; MAFF = Ministry of Agriculture, Forestry and Fisheries; MEF = Ministry of Economy and Finance; MOWRAM = Ministry of Water Resources and Meteorology; PIC = project implementation consultants; PDAFF = Provincial Department of Agriculture, Forestry and Fisheries; PDWRAM = Provincial Department of Water Resources and Meteorology; PDRD = Provincial Department of Rural Development; PMU= project management unit; PPIU = provincial project management implementation unit; TOR = terms of reference.

B. Disbursement

1. Disbursement Arrangements for ADB Funds

22. ADB loan and ADB-administered loan and grant proceeds will be disbursed in accordance with ADB's Loan Disbursement Handbook (2017, as amended from time to time), and detailed arrangements agreed upon between the government and ADB. The project staff will undertake the ADB's online training on ADB disbursement policies and procedures to ensure efficient disbursement and fiduciary control.⁴ In addition, they will attend training courses on disbursement offered by ADB and Cambodia Resident Mission.

23. The PMU is required to prepare budgets for significant activities as stated in the financing agreements and this PAM with sufficient details to allow meaningful monitoring of the subsequent performance. Actual expenditures are required to compare with the budgets. Any variation between the actual expenditure and budgets need to be justified. The detailed budget preparation for the project is stated in the Financial Management Manual (FMM).

⁴ Disbursement eLearning. http://wpqr4.adb.org/disbursement_elearning

24. The funds flow is arranged and disbursed based on the government's standard operating procedures (SOP), FMM, and ADB's procedures with further discussions among concerned parties, such as MEF, MAFF, MOWRAM, and MRD. The funds flow of the proposed project is detailed in Figure 5. For cofinancing, the GCF will channel all funds through ADB project following the ADB's lending and granting principles and procedures. This includes compliance with ADB's reporting and monitoring systems. Therefore, any cofinancing would be under ADB and the government's standard operating procedures.

25. **Advance fund procedure.** Three advance accounts, one for each funding source will be opened by MEF to receive ADB loan and ADB's administered loan and grant separately. Correspondingly three designated sub-accounts, one for each funding source, will be opened by each of MAFF, MOWRAM and MRD. In each province, PDAFF, PDWRAM and PDRD will open three separate subaccounts for each funding source with a threshold acceptable to the government to cover the project's day to day operations. The respective directors of PDAFF, PDWRAM and PDRD in each province will be accountable and responsible for proper use of advances and reconciliation of the subaccounts. The advance and sub-accounts are to be used exclusively for ADB's and ADB-administered financing's share of eligible expenditures. MEF is accountable and responsible for proper use of advances to the advance accounts, including advances to any sub-accounts.

26. The total outstanding advance for each advance account should not exceed the estimated expenditure of ADB's and ADB administered financing's share to be paid through the advance account for the forthcoming six months. MEF may request initial and additional advances to the advance accounts based on an estimate of expenditures sheet setting out the estimated expenditures to be financed through the accounts for the forthcoming six months.⁵ Supporting documents should be submitted to ADB or retained by the executing agency in accordance with ADB's Loan Disbursement Handbook (2017, as amended from time to time) when liquidating or replenishing the advance account.

27. **Statement of expenditures (SOE) procedure.**⁶ The SOE procedure may be used for reimbursement and to liquidate and replenish the advance accounts for eligible expenditures. Any individual payment to be reimbursed or liquidated under this procedure shall not exceed a ceiling of \$50,000. Supporting documents and records for the expenditures claimed under the SOE should be maintained and made readily available for review by ADB's disbursement and review missions, upon ADB's request for submission of supporting documents on a sampling basis, and for independent audit. Reimbursement and liquidation of individual payments in excess of the SOE ceiling should be supported by full documentation when submitting the withdrawal application to ADB.

28. Before the submission of the first withdrawal application (WA), the borrower should submit to ADB sufficient evidence of the authority of the person(s) who will sign the withdrawal applications on behalf of the government, together with the authenticated specimen signatures of each authorized person. The minimum value per WA is stipulated in the Loan Disbursement Handbook (2017, as amended from time to time). Individual payments below this amount should be paid (i) by the executing agency and/or implementing agency and subsequently claimed to ADB through reimbursement, or (ii) through the advance fund procedure, unless otherwise accepted by ADB. The borrower should ensure sufficient category and contract balances before

⁵ ADB. 2017. *Loan Disbursement Handbook*. Manila.

⁶ SOE forms are available in ADB's *Loan Disbursement Handbook* (2017, as amended from time to time).

requesting disbursements. The withdrawal applications must be sequentially numbered starting with number one.

29. **Disbursement arrangements for counterpart fund.** The PMU will be responsible for the disbursement and liquidation procedures for government funds and will: (i) prepare disbursement projections, and (ii) request budgetary allocations for counterpart funds. The government will finance all taxes and duties including insurance for all cost categories except civil works, training and project funded incremental operating cost, through tax exemption. Priority operating costs (salary supplements) will also be covered by counterpart funds.

30. **Counterpart funds replenishment.** The PMU completes the government withdrawal application (WA) form and attaches a statement of actual expenditure. Supporting expenditure documentation must be maintained by the project team for subsequent review by MEF or audit. The government's WA form must be signed by the authorized signatories of MAFF, MOWRAM and MRD and submitted to the Department of Multilateral Cooperation (DMC) of GDICDM/MAFF. The government's WA must be recorded in the project counterpart funds WA register.

31. The DMC will review the completed forms and transfer the funds to the project's counterpart fund account and advises the MAFF of the transfer. On receipt of advice from the National Bank of Cambodia that the funds have been deposited into the counterpart funds account, the receipt of the funds should be recorded in the general ledger and the government's WA register must be updated.

C. Accounting

32. MEF, MAFF, MOWRAM and MRD will maintain, or cause to be maintained, separate books and records by funding source for all expenditures incurred on the project. The executing agency will prepare consolidated project financial statements in accordance with the government's accounting laws and regulations which are consistent with international accounting principles and practices.

D. Auditing and Public Disclosure

33. MAFF will provide detailed consolidated project financial statements to MEF to be audited in accordance with the International Standards on Auditing and with the government's audit regulations, by an independent auditor acceptable to ADB. The audited project financial statements together with the auditor's opinion will be presented in English language to ADB within six months from the end of the fiscal year by MEF.

34. The audit report for the project financial statements will include a management letter and auditor's opinions, which cover (i) whether the project financial statements present an accurate and fair view or are presented fairly, in all material respects, in accordance with the applicable financial reporting standards; (ii) whether the proceeds of the loan and grant were used only for the purpose(s) of the project; and (iii) whether the borrower or executing agency was in compliance with the financial covenants contained in the legal agreements (where applicable).

35. Compliance with financial reporting and auditing requirements will be monitored by review missions and during normal program supervision, and followed up regularly with all concerned, including the external auditor.

36. The government, MAFF and the implementing agencies have been made aware of ADB's approach to delayed submission, and the requirements for satisfactory and acceptable quality of the audited project financial statements.⁷ ADB reserves the right to require a change in the auditor (in a manner consistent with the constitution of the borrower), or for additional support to be provided to the auditor, if the audits required are not conducted in a manner satisfactory to ADB, or if the audits are substantially delayed. ADB reserves the right to verify the project's financial accounts to confirm that the share of ADB's financing is used in accordance with ADB's policies and procedures.

37. Public disclosure of the audited project financial statements, including the auditor's opinion on the project financial statements, will be guided by ADB's Public Communications Policy 2011.⁸ After the review, ADB will disclose the audited project financial statements and the opinion of the auditors on the project financial statements no later than 14 days of ADB's confirmation of their acceptability by posting them on ADB's website. The management letter, additional auditor's opinions, and audited entity financial statements will not be disclosed.⁹

VI. PROCUREMENT AND CONSULTING SERVICES

A. Advance Contracting

38. All advance contracting will be undertaken in conformity with ADB's Procurement Guidelines (2015, as amended from time to time) and ADB's Guidelines on the Use of Consultants (2013, as amended from time to time).¹⁰ The issuance of invitations to bid under advance contracting will be subject to ADB's prior approval. The government, MAFF and the implementing agencies have been advised that approval of advance contracting does not commit ADB to finance the project.

39. **Advance contracting.** The project will proceed to recruit the project implementation consultant (PIC), feasibility study and detailed engineering design consulting firm; capacity building and climate smart agriculture consulting firm; and issue invitation for bids for the construction of the Trapaing Run irrigation subproject.¹¹

⁷ ADB's approach and procedures regarding delayed submission of audited project financial statements:

- (i) When audited project financial statements are not received by the due date, ADB will write to the executing agency advising that (a) the audit documents are overdue; and (b) if they are not received within the next six months, requests for new contract awards and disbursement such as new replenishment of advance accounts, processing of new reimbursement, and issuance of new commitment letters will not be processed.
- (ii) When audited project financial statements are not received within six months after the due date, ADB will withhold processing of requests for new contract awards and disbursement such as new replenishment of advance accounts, processing of new reimbursement, and issuance of new commitment letters. ADB will (a) inform the executing agency of ADB's actions; and (b) advise that the loan may be suspended if the audit documents are not received within the next 6 months.
- (iii) When audited project financial statements are not received within 12 months after the due date, ADB may suspend the loan.

⁸ Public Communications Policy: <http://www.adb.org/documents/pcp-2011?ref=site/disclosure/publications>.

⁹ This type of information would generally fall under public communications policy exceptions to disclosure. ADB.2011. *Public Communications Policy*. Paragraph 97(iv) and/or 97(v).

¹⁰ Universal procurement will apply R29-13: Blanket Waiver of Member Country Procurement Eligibility Restrictions in Cases of Cofinancing for Operations Financed from Asian Development Fund Resources.

¹¹ Awarding of contract is subject to the updating of the due diligence report.

B. Procurement of Goods, Works, and Consulting Services

40. All procurement of goods, works, and consulting services will be undertaken in accordance with ADB's Procurement Guidelines (2015, as amended from time to time).

41. International competitive bidding (ICB) procedures will be used for works contracts estimated to cost from \$3 million and above, and for goods contracts estimated to cost \$1 million and above. Works contracts estimated to cost below \$3 million up to \$100,000, and goods contract below \$1 million up to \$100,000 will be procured through the national competitive bidding (NCB) procedures. Minor items estimated to cost below \$100,000 for both works and goods will be procured through shopping method.

42. When NCB is proposed, before the start of any procurement, ADB and the government will review the public procurement laws of the central and state governments to ensure consistency with ADB's Procurement Guidelines (2015, as amended from time to time).

43. An 18-month procurement plan indicating threshold and review procedures, goods, works, and consulting service contract packages and national competitive bidding guidelines is in Section C.

C. Procurement Plan

Basic Data

Project Name: Climate-Friendly Agribusiness Value Chains Sector Project	
Project Number: 48409-002	Approval Number: LXXXX, LXXXX, GXXXX
Country: Cambodia	Executing Agency: Ministry of Agriculture, Forestry and Fisheries
Project Procurement Classification: B	Implementing Agencies: Cambodia Agricultural Research and Development Institute (CARDI) General Directorate of Animal Health and Production (GDAHP) General Directorate of Agriculture (GDA) General Directorate of Technical Affairs of MOWRAM General Directorate of Technical Affairs of MRD
Procurement Risk: Moderate	
Project Financing Amount: US\$ 141,041,000 ADB Financing: \$90,000,000 Cofinancing (ADB Administered): \$40,000,000 Non-ADB Financing: US\$ 11,041,000	Project Closing Date: 31 March 2025
Date of First Procurement Plan: 14 March 2018	Date of this Procurement Plan: 25 April 2018

1. Methods, Thresholds, Review and 18-Month Procurement Plan

a. Procurement and Consulting Methods and Thresholds

44. Except as ADB may otherwise agree, the following process thresholds shall apply to procurement of goods and works.

Procurement of Goods and Works		
Method	Threshold	Comments
International Competitive Bidding for Goods	US\$ 1,000,000 and Above	
National Competitive Bidding for Goods	Between US\$ 100,000 and US\$ 999,999	First two contracts subject to prior review.
Shopping for Goods	Up to US\$ 99,999	Post review.
Direct Contracting for Goods	Up to US\$ 5,000	Post review.
International Competitive Bidding for Works	US\$ 3,000,000 and Above	
National Competitive Bidding for Works	Between US\$ 100,000 and US\$ 2,999,999	First of each type of intervention regardless of the value of the contract.
Shopping for Works	Up to US\$ 99,999	Post review.

Consulting Services	
Method	Comments
Quality- and Cost-Based Selection for Consulting Firm	Full-technical proposal.
Single Source Selection for Consulting Firm	For the Variety Development Consulting Services.

b. Goods and Works Contracts Estimated to Cost \$1 Million or More

45. The following table lists goods and works contracts for which the procurement activity is either ongoing or expected to commence within the next 18 months.

Package Number	General Description	Estimated Value	Procurement Method	Review (Prior/Post)	Bidding Procedure	Advertisement Date (quarter/year)	Comments
CW3a	Construction of Agricultural Cooperative Storage Units (including equipment) - for 4 provinces	2,263,001	NCB	Prior	1S1E	Q3 / 2019	Prequalification of Bidders: N Domestic Preference Applicable: N Bidding Document: Small Works Comments: First type of intervention subject to prior review.
	Lot 1	565,750					
	Lot 2	565,750					
	Lot 3	565,750					
	Lot 4	565,750					

c. Consulting Services Contracts Estimated to Cost \$100,000 or more

46. The following table lists goods and works contracts for which the procurement activity is either ongoing or expected to commence within the next 18 months.

Package Number	General Description	Estimated Value (US\$)	Recruitment Method	Review (Prior/Post)	Type of Proposal	Advertisement Date(quarter/year)	Comments
CS1	Project Implementation Consultant (PIC)	4,379,920	QCBS	Prior	FTP	Q2 / 2018	Assignment: International Advance contracting: Yes Comments: 100% ADB (quality cost-ratio: 80:20)
CS2	Capacity Building and Climate Smart Agriculture Consulting Firm	3,478,429	QCBS	Prior	FTP	Q2 / 2018	Assignment: International Advance contracting: Yes Comments: 100% ADB (quality cost-ratio: 90:10)

Package Number	General Description	Estimated Value (US\$)	Recruitment Method	Review (Prior/Post)	Type of Proposal	Advertisement Date(quarter/year)	Comments
CS3	Variety development by IIRI	2,787,015	SSS	Prior	FTP	Q4/ 2018	Assignment: International Advance contracting: No Comments: 100% GCF Grant
CS5	Feasibility studies & Detailed engineering design consulting firm (for irrigation and rural roads)	2,622,704	QCBS	Prior	FTP	Q2 / 2018	Assignment: International Advance contracting: Yes Comments: 100% ADB (quality cost-ratio:80:20)

d. Goods and Works Contracts Estimated to Cost Less than \$1 Million and Consulting Services Contracts Less than \$100,000 (Smaller Value Contracts)

47. The following table groups smaller-value goods, works and consulting services contracts for which the activity is either ongoing or expected to commence within the next 18 months.

Goods and Works								
Package Number	General Description	Estimated Value (\$)	Number of Packages	Procurement Method	Review (Prior / Post)	Bidding Procedure	Advertisement Date (quarter/year)	Comments
CW2	Trapaing Run Irrigation Subproject	884,746	1	NCB	Prior	1S1E	Q4 / 2018	Prequalification of Bidders: No Domestic Preference Applicable: No Bidding Document: Small Works
CW3a	Construction of agricultural cooperative storage units (including equipment) (5@ 4 province)	2,263,001	4	NCB	Post	1S1E	Q3 / 2019	Advance contracting: No Bidding document: Small works. Comments: First NCB package subject to prior review.
G5	Pick-up Vehicles, 15 units	795,532	1	NCB	Prior	1S1E	Q1 / 2019	Prequalification of Bidders: No Domestic Preference Applicable: No

Goods and Works								
Package Number	General Description	Estimated Value (\$)	Number of Packages	Procurement Method	Review (Prior / Post)	Bidding Procedure	Advertise-mentDate (quarter/year)	Comments
								Bidding Document: Goods
G6	Motorcycles, 47 units	96,242	1	Shopping	Post		Q2 / 2019	

e. Indicative List of Packages Required Under the Project

48. The following table provides an indicative list of goods, works and consulting services contracts over the life of the project, other than those mentioned in previous sections (i.e. those expected beyond the current period).

Goods and Works							
Package Number	General Description	Estimated Value (\$)	Estimated No. of Packages	Procurement Method	Review (Prior / Post)	Bidding Procedure	Comments
CW11	24 units of Flatbed Batch Drier (includes works)	656,241	24	Shopping	Post		
CW12-16	Remaining Irrigation subprojects for four provinces	31,009,826	12	NCB	Post	1S1E	Prequalification of Bidders: No Domestic Preference Applicable: No Bidding Document: Small Works
CW17	Construction of rural roads - paved and laterite	36,039,116	16	NCB	Prior	1S1E	Prequalification of Bidders: No Domestic Preference Applicable: No Bidding Document: Small Works Comments: First type of intervention subject to prior review.
D1	Demonstration and Training for Laser land levelling (4,000ha)	2,279,592	4	NCB	Prior	1S1E	Prequalification of Bidders: No Domestic Preference Applicable: No

							<p>Bidding Document: Small Works</p> <p>Comments: First type of intervention subject to prior review.</p>
CW18	Repairing Glasshouse for Germplasm Maintenance + net house	769,445	3	NCB	Post	1S1E	<p>Prequalification of Bidders: No</p> <p>Domestic Preference Applicable: No</p> <p>Bidding Document: Small Works</p>
CW1a	On-Farm Water Catchment Ponds - for 4 provinces (1st batch)	1,134,368	8	NCB	Prior	1S1E	<p>Prequalification of Bidders: No</p> <p>Domestic Preference Applicable: No</p> <p>Bidding Document: Small Works</p> <p>Comments: First type of intervention subject to prior review</p>
CW1b	On-Farm Water Catchment Ponds - for 4 provinces (Other batches)	8,418,208	24	NCB	Post	1S1E	<p>Prequalification of Bidders: No</p> <p>Domestic Preference Applicable: No</p> <p>Bidding Document: Small Works</p>
CW3b	Construction of Agricultural Cooperative Storage Units (including equipment) - (Remaining batches)	6,789,004	12	NCB	Post	1S1E	<p>Prequalification of Bidders: No</p> <p>Domestic Preference Applicable: No</p> <p>Bidding Document: Large Works</p>
CW4	Construction of Training Building for PADC & Equipment	248,841	3	NCB	Prior	1S1E	<p>Prequalification of Bidders: No</p> <p>Domestic Preference Applicable: No</p>

	Lot 1 – Takeo Lot 2 – Tboung Khumm Lot 3 – Kampong Chumm	82,947 82,947 82,947					Bidding Document: Small Works Comments: First type of intervention subject to prior preview.
CW5	Renovation of Agriculture Extension Building in Kampot	30,170	1	Shopping	Post		
CW7	Construction of Mechanization Workshops (including major & minor equipment) & Supervision	632,307	3	NCB	Prior	1S1E	Prequalification of Bidders: No Domestic Preference Applicable: No Bidding Document: Small Works Comments: First type of intervention subject to prior review.
G1	Biotechnology (NAL) Laboratory (including tissue culture equipment)	2,133,575	1	ICB	Prior	1S1E	Prequalification of Bidders: No Domestic Preference Applicable: No Bidding Document: Goods Comments: First type of intervention subject to prior review
G7	ICT Equipment, training, studies	3,502,131	1	ICB	Prior	1S1E	Prequalification of Bidders: No Domestic Preference Applicable: No Bidding Document: Goods
G2	Rapid Test Kits + Bio / Organic Fertilizer Laboratory (materials and equipment)	982,698	1	NCB	Post	1S1E	Prequalification of Bidders: No Domestic Preference Applicable: No Bidding Document: Goods
G3	Equipment & Materials for 15 Drip Irrigations	805,617	1	NCB	Prior	1S1E	Prequalification of Bidders: No

	systems (includes tube wells/water source connection, solar pumps and other agricultural inputs - training)						Domestic Preference Applicable: No Bidding Document: Goods Comments: First type of intervention subject to prior review
CW19	Installation and commissioning of 12,000 biogasifiers*	9,275,983	16	NCB	Post	1S1E	Prequalification of Bidders: No Domestic Preference Applicable: No Bidding Document: Goods
G4	Equipment for Mechanizations Workshops for all four provinces	114,368	1	NCB	Post	1S1E	Prequalification of Bidders: No Domestic Preference Applicable: No Bidding Document: Goods
G8	6 Paddy milling equipment	112,382	1	NCB	Post	1S1E	Prequalification of Bidders: No Domestic Preference Applicable: No Bidding Document: Small Works
G9	5 units, Maize shellers (2 ton)	18,730	1	Shopping	Post		

* The amount includes contribution from GCF, government and beneficiaries. The amount will be revised based on additional due diligence during project implementation.

Consulting Services							
Package Number	General Description	Estimated Value	Number of Contracts	Recruitment Method	Review (Prior/Post)	Type of Proposal	Comments
CS4	ICT Consultants	1,737,401	1	QCBS	Prior	FTP	Assignment: International Quality-Cost Ratio: 90:10 Comments: Technical skills required.

f. National Competitive Bidding

i. Regulation and Reference Documents

49. The procedures to be followed for national competitive bidding shall be those set forth for the National Competitive Bidding (NCB) method in the government's procurement manual issued under Sub-Decree Number 74 ANKR.BK, updated version dated 22 May 2012 with the clarifications and modifications described in the following paragraphs. These clarifications and modifications are required for compliance with the provisions of the procurement guidelines.

50. For the procurement of ADB financed contracts under NCB procedures, the use of harmonized national bidding documents (NCB and National Shopping) developed in consultation with development partners including ADB, is mandatory except where the government and ADB have agreed to amendments to any part of the documents. The procurement manual also advises users to check the ADB website from time to time for any update on ADB documents, which form the basis, among others, of the existing harmonized national bidding documents.

ii. Procurement Procedures

1. Application

51. Contract packages subject to NCB procedures will be those identified as such in the project procurement plan. Any change to the mode of procurement of any procurement package in the procurement plan shall be made through updating of the procurement plan, and only with prior approval of ADB.

2. Sanctioning

52. Bidders shall not be declared ineligible or prohibited from bidding on the basis of barring procedures or sanction lists, except individuals and firms sanctioned by ADB, without prior approval of ADB.

3. Rejection of All Bids and Rebidding

53. The borrower shall not reject all bids and solicit new bids without ADB's prior concurrence. Even when only one or a few bids is/are submitted, the bidding process may still be considered valid if the bid was satisfactorily advertised and prices are reasonable in comparison to market values.

4. Advertising

54. Bidding of NCB contracts shall be advertised on the ADB website via the posting of the procurement plan. Borrowers have the option of requesting ADB to post specific notices in the ADB website.

iii. Bidding Documents

1. Use of Bidding Documents

55. The standard NCB documents provided with the government's procurement manual shall be used to the extent possible both for the master bidding documents and the contract-specific bidding documents. The English language version of the procurement documents shall be

submitted for ADB review and approval in accordance with agreed review procedures (post and prior review) as indicated in the procurement plan. The ADB-approved procurement documents will then be used as a model for all procurement financed by ADB for the project.

2. Bid Evaluation

56. Bidders shall not be eliminated from detailed evaluation on the basis of minor, non-substantial deviations.

57. A bidder shall not be required, as a condition for award of contract, to undertake obligations not specified in the bidding documents or otherwise to modify the bid as originally submitted.

3. Employer's Right to Accept or Reject Any or All Bids

58. The decision of the employer to accept or reject any or all bids shall be made in a transparent manner and involve an obligation to inform of the grounds for the decision through the bid evaluation report.

iv. ADB Policy Clauses

59. A provision shall be included in all NCB works and goods contracts financed by ADB requiring suppliers and contractors to permit ADB to inspect their accounts and records and other documents relating to the bid submission and the performance of the contract, and to have them audited by auditors appointed by ADB.

60. A provision shall be included in all bidding documents for NCB works and goods contracts financed by ADB stating that the borrower shall reject a proposal for award if it determines that the bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the contract in question.

61. A provision shall be included in all bidding documents for NCB works and goods contracts financed by ADB stating that ADB will declare a firm or individual ineligible, either indefinitely or for a stated period, to be awarded a contract financed by ADB, if it at any time determines that the firm or individual has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices or any integrity violation in competing for, or in executing, ADB-financed contract.

D. Consultant's Terms of Reference

62. All consulting services will be recruited according to ADB's Guidelines on the Use of Consultants (2013, as amended from time to time).¹² To provide technical assistance to the executing and implementing agencies in the implementation and management of the project, the following consulting services will be engaged:

¹² Checklists for actions required to contract consultants by method available in e-Handbook on Project Implementation at <http://www.adb.org/documents/handbooks/project-implementation/>.

Table 11: Project Implementation Consultant Services (CS1)

Experts	International	National
Project Management & Rural Infrastructure Specialist & Team Leader	18	
Procurement Specialist (1 international and 3 nationals)	6	54
Social Development & Gender Specialist	6	50
Social Safeguards Specialist	8	72
Environment & Climate Change Specialist	8	50
PADC Operations & Management Specialist	4	
Mechanization Workshop, Operations & Management Specialist	4	
Project Management & Rural Infrastructure Specialist & Deputy Team Leader (3 individuals)		90
Financial Management Specialist (4 individuals)		152
Water Management and Irrigation Engineer - approval of DED and construction supervision (4 individuals)		114
Cooperative Storage & Rural Roads Engineer - approval of DED and construction supervision (4 individuals)		136
Total	54	718

Table 12: Capacity Building and Climate Smart Agriculture Consulting Firm (CS2)

Experts	International	National
Policy & Standards Advisor	7	36
Seed Commercialization & Intellectual Property Specialist	5	
GAP, CSA & SRP Training Specialist	9	
Cooperative Agribusiness Training Specialist	6	
Photo-voltaic Specialist	4	12
Bio-slurry Specialist	4	34
Biodigester Standards Specialist	3	
Green Financing Specialist	10	36
Laboratory Commercialization Specialist		3
ISO 17025 Accreditation Compliance Specialist		7
Training & Capacity Building Specialist		60
Farmer Demonstration Specialist		62
GAP for Tropical Fruit Specialist		19
FWUC Training Specialist		37
Agricultural Machinery O&M Training Specialist		54
Public Private Partnership Specialist		30
Bio-fertilizer & Organic Fertilizer Testing Specialist		4
Tissue Culture Development Specialist		3
GMO & Phytotoxin Analysis Specialist		3
National Laboratory Coordinator		46
Total	48	446

Table 13: Information and Communication Technology Platform (CS4)

Experts	International	National
Team Leader/ Project Manager	6	
Solution Architect	3	
e-Agriculture expert	6	18
Climate Smart Agriculture Expert	6	12
Climate Risk Management IT Specialist	6	
Coordinator / Deputy Team Leader		18
Total	27	48

Table 14: Feasibility and Detailed Engineering Design Consultant (CS5)

Experts	International	National
Team Leader/Irrigation Design Engineer	20	20
Hydrologist	2	4
Agricultural Economist	5	6
Social Safeguards Specialist	2	
Environment Safeguards Specialist	2	10
Agriculturist		6
Road Design Engineer		20
AutoCAD Specialist (4 individuals)		42
Social Development and Gender Safeguard Specialist		4
Resettlement Specialist		6
Procurement Specialist		4
Total	31	116

63. The PIC will provide support and guidance to the feasibility study and detailed engineering design consultants (package: CS5) particularly in the areas of preparation of social and environmental safeguard studies, economic analysis to ensure compliance with the borrower's and ADB requirement, and climate change resilience and adaptation options, as required. The Technical Services consultants will provide support to: (i) on-farm and formal training; (ii) National Agriculture Laboratory; (iii) green financing initiatives; and (iv) renewable energy.

64. The International Rice Research Institute (IRRI) (package:CS3), will be recruited using the single-source selection method for output 2 in coordination with CARDI. IRRI has been working with Cambodia since 1986 and on crops and climate change research since 1991 - a time when climate change was considered a marginal topic within agriculture research. The institute has defined a coherent research portfolio on climate change emphasizing on three areas: adaptation, mitigation, and policy. This sets crop production into the broader context of food supply and food security alongside socioeconomic issues, such as rural development and gender mainstreaming. IRRI also maintains solid working relationships with other international crop research institutes belonging to the Consortium of International Agricultural Research Centers (CGIAR) and has agreed to deliver their solutions to Cambodia in a seamless manner.¹³ Detailed terms of reference for each package are provided in Annex 2.

¹³ Formerly the Consultative Group for International Agricultural Research.

VII. SAFEGUARDS

A. Resettlement and Land Acquisition

65. The project is Category B for involuntary resettlement (IR). The due diligence conducted during the project preparatory stage for three representative subproject suggests that the project will not entail significant impact, physical or economic displacement, or loss of livelihood. However, given that some subprojects will only be prepared after ADB's Board approval, a Land Acquisition and Resettlement Framework (LARF) has been prepared to set out procedures to be used to guide screening and selecting subprojects during implementation as well as the subprojects' Land Acquisition and Resettlement Planning (LARP) if land acquisition and involuntary resettlement impacts or related unanticipated impacts are identified. It will also guide the due diligence process following completion of the detailed engineering design to justify the subproject's category, in case it does not have any impact. The draft resettlement due diligence reports for the representative subproject will be updated and finalized, and due diligence report for all subsequent subprojects prepared based on detailed engineering design. The LARP will be prepared in accordance with LARF, ADB's SPS and submitted to ADB for review before any contracts are awarded. The LARP should be implemented first before civil works start.

66. Subproject screening will be used during project implementation in identifying additional subprojects and only subprojects classified as category B or C for IR will be considered for financing. Projects requiring any significant involuntary resettlement or land acquisition will be rejected.

67. The General Department of Resettlement (GDR) will assume responsibility drafting LARPs for the subprojects with IR impact and for internal monitoring during its implementation. GDR will ensure that the final LARP: (i) adequately addresses all involuntary resettlement issues pertaining to the project, (ii) describes specific mitigation measures that will be taken to address the issues, and (iii) ensures the availability of sufficient resources to address the issues satisfactorily. No physical and economic displacement will occur until compensation in full at replacement cost and all other entitlements are paid to the displaced person (DP) in accordance with the approved LARP.

68. The due diligence report (DDR) prepared for the Trapaing Run irrigation scheme, drafted based on the preliminary design outcomes, must be updated upon completion of the detailed engineering design. Based on the preliminary design, through a participatory detailed measurement conducted together with villagers, some 11 households agreed donating a total of 298m² mainly bunds of their farmlands and not exceeding 1.3% of the total plot size per household. Forms indicating each household's willingness to donate were signed by each household however the formal donation form prescribed by ADB has yet to be signed and witnessed by commune and village authorities as it was agreed with the community that this should not be done until the final detailed engineering design has been completed and accepted by the community.

69. IRC shall ensure: (i) efficient project-specific grievance redress mechanisms are in place and functional to assist the affected persons resolve queries and complaints, if any, in a timely manner; (ii) all complaints are registered, investigated and resolved in a manner consistent with the provisions of the grievance redress mechanism described in the LARF/LARP; (iii) the complainants are kept informed about status of their grievances and remedies available to them; and (iv) adequate staff and resources are available for supervising and monitoring the mechanism.

70. The EA, IAs, and ADB shall ensure that all the safeguards documents including due diligence and monitoring reports are disclosed by: (i) uploading the draft and ADB approved final safeguards documents on PMU, and ADB website, (ii) information pamphlet containing summary of the projects impacts, if required in local language is distributed among the displaced persons. The international and national safeguards specialists will work closely with the project engineer to ensure that the detailed engineering design closely accords with the preliminary design already accepted by the Trapaing Run community and will ensure that the final design is presented and passed at subsequent community meetings and specifically by those affected households donating land. The specialists will ensure that the donation forms are completed, one per household, duly signed by husband and wife, and witnessed by village and commune officials. These completed forms must be retained in the project office and made available for case audit by an independent agent.

71. The specialists will then screen all additional subprojects identified during project implementation and rigidly apply both the "involuntary" and "voluntary" screening checklists. Where involuntary acquisition or voluntary land donation will take place, GDR of MEF in coordination with the executing agency and specialists must prepare a LARP or DDR in accordance with LARF. This LARP must clearly outline the community consultation process and detail the benefits to be received by the affected households. LARPs will be subject to a 10% case audit by an independent agent selected through a transparent bidding process conducted by the PMU. Because there are no major involuntary resettlement impacts there is no need for an external monitoring agency (EMA).

72. Land for the project purposes may be acquired through a negotiated settlement from private land owners under a commercial contract. The price will be negotiated as part of commercial norms based on the replacement cost, and the owner will have the right to refuse the offer. In this case, the site will be changed, and the same procedure will be undertaken for the newly identified site and private landowner. The government will ensure that any negotiations with displaced persons openly address the risks of asymmetry of information and bargaining power of the parties involved in the negotiated settlement. For this purpose, government will engage an independent external party to document the negotiation and settlement processes in line with the requirements of the ADB SPS (2009).

73. Where market rates for land might be largely absent, the Replacement Cost Study for the Project will consult with affected landowners/users to determine compensation amounts for land to be purchased and assets on such land. This will be based on (i) information about recent land transactions - if any; (ii) land types; (iii) cropping patterns and crop production; and (iv) availability of land in pilot areas. The project will ensure that compensation amounts are based on the replacement cost principle in accordance with ADB SPS (2009).

74. IRC/GDR in case of involuntary resettlement, shall provide the independent verification of the agreements reflecting that: (i) consultation/s with landowner/s have been undertaken meaningfully, freely and in good faith and the landowners have made informed decisions on use of land, and (ii) terms and conditions of the agreements have been explained to them and understood and agreed by the landowner/s. (iii) validate that landowner/s or any other users/occupants will not experience major adverse impacts from land use or purchase by the Project; (iv) validate that any minor impacts have been identified, sufficiently addressed and documented by the project; (v) validate that compensation for any land purchase represents a fair and reasonable replacement cost based on market prices; and (vi) validate that the agreement is in compliance with safeguard requirements stipulated in this framework

75. The PMU in coordination with the local authority will perform following tasks: (i) review of the documentation on the identification of affected landowners and the consultation and negotiation process leading up to the signing of the agreements; (ii) validate that consultations with the landowners have been undertaken and that they were provided with relevant information as per the resettlement framework; (iii) validate that the agreement is voluntary (free of coercion) and that the landowner/s have fully understood and agreed to the agreement's terms and conditions; and (iv) validate that the landowner representative/s signing the agreement duly represent the landowners;.

76. The external validation report will not be publicly disclosed because transaction will be based on the commercial contract, and not under involuntary acquisition under the Expropriation Law. The external party validation report will be kept in files of IRC/GDR and copy sent to ADB for internal concurrence.

77. In case if negotiations fail, expropriation will be followed, and LARP will be prepared based on LARF and according to ADB SPS (2009).

78. Meaningful consultations were carried out during the project preparatory stage for three representative subprojects during resettlement due diligence. However, for continued information sharing, MAFF and GDR shall ensure that: (i) additional consultations are conducted during updating and implementation of the safeguards documents; (ii) the displaced persons if any are informed about: (a) resettlement impacts, asset valuation, entitlements and compensation payment modalities with timelines, (b) rehabilitation and income restoration measures suggested for the project displaced persons, and (c) project-specific grievance redress mechanism put in place with status of redress of grievances; and (iii) liaison is maintained with affected persons and community, and consultation meetings are held regularly with surrounding communities and project displaced persons including women and vulnerable groups to share project related information during project implementation period.

B. Indigenous People and / or Ethnic Minority Groups

79. The project is Category B for indigenous people or ethnic minorities as there are ethnic minority communities in target provinces (mainly ethnic Cham and Vietnamese). Although there are ethnic minorities living in the project target provinces, no such communities or households were encountered in the three representative subproject feasibility studies. However, it is possible that additional subprojects identified during implementation may affect ethnic minority communities or households.

80. An ethnic minority development framework (EMDF) has been prepared during project preparation. The underlying feature of the EMDF is inclusion and participation, although there are some constraints beyond the parameters of influence of the project that could affect the degree of benefit available. The EMDF recommends action to maximize participation and consultation with any minority households should they be encountered.

81. If during detailed engineering design or implementation, any change to the scope, location with prior approval of ADB, causes to have any impact on indigenous peoples or ethnic minorities, EA/IA shall take all steps required to ensure that the project complies with the applicable laws and regulations of Cambodia and ADB's SPS 2009. The national safeguards specialist will undertake subproject screening to ascertain the presence of any ethnic minorities and where they are present, will include actions from the EMDF as appropriate.

C. Environment

82. **Environmental safeguard category.** Based on ADB's rapid environment assessment checklist, the project is classified as Category B. An environmental assessment and review framework (EARF) has been prepared to guide future subproject selection, screening, assessment and reporting. An initial environmental examination (IEE) was prepared for the Trapaing Run Irrigation Subproject in Kampot province; and environmental codes of conduct were prepared for the Mango Drip Irrigation Subproject in Takeo province, and the Cassava Chip Drying and Storage Unit in Tboung Khmum province. These confirmed that the proposed investments are not likely to cause significant adverse environmental impacts.

83. **Environmental management plan (EMP).** An EMP has been prepared for the Trapaing Run Irrigation Subproject in Kampot province and included in its IEE. For future subprojects, the EMP presents impacts, mitigation and monitoring measures, institutional arrangements, training requirements and implementation budget. Budgets for EMP implementation will be included in the design, construction and operation and maintenance costs. The EMP will be implemented by the contractors and supervised by PIC and implementing agencies. The EMP is a critical document for project implementation and requirements are subject to project assurances and contractor requirements.

84. **Grievance redress mechanism.** A grievance redress mechanism (GRM) will be established in each subproject province in compliance with ADB's SPS (2009) requirement to prevent and address community concerns and assist the project to maximize environmental and social benefits. The GRM will be accessible to diverse members of the community, including more vulnerable groups such as women and youth. Multiple points of entry, including face-to-face meetings, written complaints, telephone conversations, or e-mail, will be available. Details about the GRM can be found in the EARF and IEE.

85. **Institutional arrangements for environmental management.** MAFF will be responsible for ensuring that project performance is monitored throughout implementation and the project is implemented in line with ADB and government requirements for environmental safeguards. MAFF will appoint a National Safeguards Officer at PMU to coordinate with MRD and MOWRAM at the national and provincial level to oversee implementation of project environmental safeguard requirements. An International Environment and Climate Change Specialist (8 person-months), and a National Environmental and Climate Change Specialist (50 person-months) will be recruited under PIC to support PMU National Safeguards Officer with climate risk screening of subprojects, environmental training, environmental supervision and monitoring and preparation of quarterly project progress reports and semi-annual environmental monitoring reports in accordance with the EARF. In addition, an international environmental safeguards specialist (2 person-months) and a national environmental safeguards specialist (10 person-months) will also be recruited as part of the Package CS5: Feasibility and Detailed Engineering Design to assist with environmental and screening of subprojects and preparation of assessment reports and management plans as part of the feasibility studies and detailed engineering design.

86. **Prohibited investment activities.** Pursuant to ADB's Safeguard Policy Statement (2009), ADB funds may not be applied to the activities described on the ADB Prohibited Investment Activities List set forth at Annex 5 of the Safeguard Policy Statement (2009).

87. **Disclosure.** The executing agency and implementing agencies will be responsible for disclosing all safeguard reports at the provincial level and on the project website. During the project implementation period, all IEEs and semi-annual environmental safeguard monitoring

reports will be submitted to ADB every July, which will cover the reporting period of January to June, and every January, which covers the reporting period of July to December for disclosure on ADB website.

VIII. GENDER AND SOCIAL DIMENSIONS

88. **Gender dimensions.** Women are key actors in the value chains especially for rice and cassava. They are producers, collectors/intermediaries and rice millers, and own and operate their own enterprises. Rural women generally have joint access and control to land and capital together with their husbands and are solely responsible for managing finances for the household. There is equal access of men and women to markets. Both husband and wife jointly agree when, where and to whom to sell the crop, but it is the responsibility of the wife to contact the local (usually female) collector. Nationally, women represent about 60% of agricultural cooperative members, and they run over a third of fruit and vegetable processing enterprises and almost half of all wholesale agricultural raw materials enterprises. Majority of women's businesses are micro-enterprises.

89. Women are aware of their own technical shortcomings and express an eagerness to learn new techniques. They are also aware that they have had fewer agricultural training opportunities than men, which may be partly explained with the current practice of addressing invitations for agricultural trainings and meetings to the heads of the household (thus mostly men). The use of visual teaching aids during information and training sessions was also found to be crucial to enhance farmers' understanding, especially women who continue to have lower literacy levels. During PPTA consultations, some women expressed interest to learn how to drive two-wheel tractors and operate other agricultural machinery, which would allow them the opportunity to have paid work as drivers and prepare them for future farm mechanization. Other major challenges related to the sector and project faced by both women and men although more so by women include lack of access to year-round water, labor force for agricultural production, affordable credit and market related information.

90. Nationally, 22% of all households are headed by women. Female-headed households with more than two children and no adult males are much more likely to be poor and the girls more likely to be working. Households headed by women are likely to be more vulnerable, have smaller land holdings than men, and more frequently suffer from labor shortages. For households headed by older women where adult children have migrated and left grandchildren in their care, it was found during the PPTA that their workload is very substantial. In addition to taking care of numerous small children and livestock, they also in many cases need to work as day laborers to make ends meet.

91. MAFF prepared the Gender Mainstreaming Policy and Strategic Framework in Agriculture 2016–2020 (GMPS). The GMPS contains strategic objectives to: (1) promote women's economic empowerment through women's access to goods and services for agricultural development and markets; (2) strengthen capacities, resources and commitment within MAFF to ensure effective mainstreaming of gender perspectives into agriculture sector; and (3) increase women's and men's equal representation and participation in agriculture sector.

92. **Gender Action Plan (GAP).** A GAP (Table 15) has been prepared for this project, which includes gender actions, performance indicators and targets to promote women's voice and active participation in all project activities. It will support the strengthening of national systems for mainstreaming gender in MAFF, such as the MAFF Gender & Children Project Support Unit (GCPSU), the Women Farmers Network (WFN) and the operationalization of the MAFF GMPS,

in particular specific outputs under the Strategic Framework and components that are relevant to this project. During implementation, GAP actions will align to build on and synergize with the MOWA Climate Change Strategy and Plan and the ADB Mainstreaming Climate Resilience into Development Planning (MCRDP) project (CSO and MOWA/Gender Components).

93. **GAP Implementation.** The executing and implementing agencies, especially PMU and PPIUs, will be responsible for the implementation and monitoring of GAP, and will work in close partnership with MAFF GCPSU and provincial gender focal points, as well as the WFN, and agricultural cooperatives. The principles underpinning GAP are to ensure sustainable improvements in gender processes and outcomes at an institutional and policy level by building capacity as follows:

- (i) To mainstream gender into partner institutions such as: executing agency (MAFF), implementing agency, at national and sub-national levels (i.e. Department of Agriculture Extension, etc.), agribusinesses and cooperatives, FWUCs, MFIs, etc.; and
 - (ii) Of existing gender, responsive entities such as the MAFF GCPSU and WFN, to advocate for, facilitate and monitor expanding women farmers' access to services and opportunities through collaboration and partnership in all project activities.
94. Close partnership with WFN is particularly important for the following reasons:
- (i) The WFN was established in 2015 with the support from the MAFF GCPSU, and is represented by two women farmers in each province;
 - (ii) Many of the network members are also local leaders such as commune council members, cooperative members or savings group members, and they are invited and encouraged to attend province-level MAFF workshops for capacity building and training of trainers;
 - (iii) Technical information to women farmers in the network is disseminated through social media pages (which the project can tap into); and
 - (iv) The Network has links to local Community Innovation Centers (which can be used for training activities), one of which is in Takeo. Note that the most important demands of the WFN include increase women's access to credit (with low interest rates), and management and business training and support – which the project aims to address.

95. The PMU will appoint a safeguard and gender focal point, who will work closely with the MAFF GCPSU at national level, and the provincial implementing units will work closely with the provincial gender focal points in each of the four provinces. A social development and gender consultants (for international, 6 person-months and for national, 50 person-months) will be recruited as part of the PIC team, will build capacity of the gender focal points, the PMU and provincial implementing unit staff as well as the MAFF GCPSU, in gender analysis and mainstreaming, and support GAP implementation, monitoring and reporting. Work plans and budget to implement the GAP activities will be prepared annually.

96. Adequate financial resources have been allocated to implement the GAP. Implementation of its activities should be covered by the budget allocated for implementation of the regular project activities under the corresponding outputs, including any extra costs implied by special arrangements that shall be made to facilitate and increase women's participation in the regular project activities (e.g. such as series of shorter training sessions at venue closer to their communities and provision of on-site child supervision for women trainees as needed, etc.).

Table 15: Gender Action Plan

Project outputs	Gender activities/actions	Performance indicators/targets	Responsible entities	Timeline	Cost estimates ¹⁴
Output 1: Critical agribusiness value chain infrastructure improved and made climate resilient					
Gender Objectives 1.1 Ensure critical agribusiness value chain infrastructure is responsive to the needs of women and men	1.1.1 Involve women and Women Farmers Network (WFN) representatives actively and meaningfully in each individual event for all consultations and planning activities related to improvement and climate resiliency of critical infrastructure supported by the project. <i>- This would mean paying attention to the following aspects: convenient time, adequate venue, information sharing with visual aids/illustrations, having female facilitators, child supervision arrangements, etc.</i>	1.1.1 (i) Women are 40% of participants– aggregate basis (point of reference: female population: 54% in subproject 1, 47% in subproject 2; and 48% in subproject 3; 30% female participation in similar activities currently); (ii) At least 50,000 females benefiting from rehabilitated climate resilient irrigation and water management systems	PMU MAFF (lead) and PPIUs; MOWRAM; MRD; WFN; design engineers	Q1 Y2 - Q4 Y4	Covered under PIC (other than civil works) budget
1.2 Enhance income generating opportunities for women	1.2.1 Ensure women benefit from jobs created by the project related to infrastructure construction/rehabilitation as well as operation and maintenance. <i>- This would mean that information about such employment opportunities will be communicated through adequate channels to reach out women in the communities.</i> <i>- Core labor standards will be complied with (equal pay for work of equal value, no child labor) for all civil works related to the project.</i> <i>- Other measures that are needed will be taken (e.g. child supervision arrangements even if informal) so that interested women can grasp such opportunities.</i> 1.2.2 Provide skills enhancement for women in infrastructure related construction/rehabilitation (e.g. masonry skills for bio-digesters construction), and operation and maintenance (e.g. small-scale irrigation schemes).	1.2.1 At least 25% of workdays created will be filled by women disaggregated by skilled/unskilled and type of work (point of reference: women's current involvement in similar infrastructure related work varying between 17% to 46%) 1.2.2 At least 30% women FWUC members developed capacity to operate and maintain irrigation schemes.	PMU MAFF (lead) and PPIUs; MOWRAM; MRD; contractors of civil works PMU MAFF (lead) and PPIUs; GDAHP; MOWRAM; MRD; contractors of civil works	Q1 Y2 - Q4 Y6 Q4 Y1 – Q4 Y6	Covered under PIC civil works (irrigation, roads, warehouses, biogas, other infrastructure) budget. Covered under training budget (for civil works) Covered under training and

¹⁴ Whenever implementation of the gender activities/actions are part of implementation of the regular project activities, they will be covered under the corresponding budget for these project activities, of which up to 5% can be used to make special arrangements (e.g. trainings; different venue; child supervision) and/or develop targeted materials where and when needed to ensure women can fully participate in and benefit from the project activities, and more particularly to ensure gender targets included in this project gender action plan are met.

1.3 Increase the uptake of biodigesters	<p>1.3.1 As part of the promotion campaigns about biodigesters and other renewable energy solutions, raise awareness among women and men in the communities about the benefits for value chain improvement/climate change but also for greater gender equality (time saving, drudgery reduction, improved health).</p> <p>1.3.2 Involve women as active agents in the promotion campaigns on the use of renewable energy solutions.</p>	<p>1.3.1 At least 40,000 women (or 50% of total beneficiaries) are beneficiaries of biodigesters and compost huts installed (baseline: 5,721 women).</p> <p>1.3.2 Number and percentage of women active agents.</p>	PMU MAFF (lead) and PPIUs; GDAHP	<p>Q1 Y2 – Q4 Y4</p> <p>Q4 Y1 – Q4 Y4</p>	promotion materials budget (for biogas)
Output 2: Climate smart agriculture and agribusiness promoted					
Gender Objectives 2.1 Strengthen women farmers' (individual and member of cooperatives) involvement along climate-friendly agribusiness value chains	<p>2.1.1 Involve women farmers (and the WFN) actively in the selection and multiplication of climate resilient crops varieties and build on their local knowledge in this area.</p> <p>2.1.2 Involve women farmers and WFN representatives actively and meaningfully in each individual event for all capacity-building activities (trainings, demonstrations, study tours) supported by the project: (1) agricultural extension and technical capacity-building activities including those related to climate change adaptation and mitigation; (2) trainings on how to operate and maintain a range of agricultural machinery; (3), management (including leadership, negotiation) and business skills trainings. <i>- This would mean paying special attention to the following aspects: adequate venue, timing, duration, way that invitation is being done (not to head of household as is currently being done), use of visual aids and other illustrated materials, use of female facilitators/demonstrators and extension agents, child care arrangements even if informal, etc.</i></p> <p>2.1.3 Strengthen linkages between women-led and/or owned farms/enterprises* and agribusiness industry</p> <p>For support provided to cooperatives: preferential support will be given to agricultural cooperatives with a majority of female members.</p>	<p>2.1.1 Number and % of women farmers involved</p> <p>For 2.1.2 (1) and (3): Women are 40% of total participants (aggregate basis) or at least 16,000 women farmers are trained in CSA and agribusiness development skills (point of reference: female population: 54% in subproject 1, 47% in subproject 2; and 48% in subproject 3 with almost all of them farming; 30% female participation in similar activities currently).</p> <p>For 2.1.2 (2): (i) Number and percentage of women farmers trained in each event; (ii) women represent 40% of increased labor pool of individuals who can operate agricultural machinery over the baseline (baseline: 0).</p> <p>2.1.3 (i) Number and type of activities conducted; (ii) at least 8,000 women farmers (or 50% of total women farmers trained) are SRP compliant with direct links to millers and exporters</p>	<p>PMU MAFF (lead) and PPIUs; CARDI; WFN</p> <p>PMU MAFF (lead) and PPIUs, MOWRAM, WFN</p> <p>PMU MAFF (lead) and PPIUs</p> <p>PMU MAFF (lead) and PPIUs; WFN</p>	<p>Q4 Y1 – Q4 Y6</p> <p>Q1 Y2 – Q4 Y6</p> <p>Q4 Y1 – Q4 Y5</p> <p>Q1 Y2 – Q4 Y2</p>	<p>Covered under resilient varieties budget</p> <p>Covered under training budget for production practices and technologies and PIC (other than civil works) budget</p> <p>Covered under training budget for production practices and technologies and PIC (other than civil works) budget</p> <p>Covered under PIC (other than civil works) budget</p>

2.2 Ensure female staff benefit from capacity-building activities related to climate-friendly agribusiness value chains	<p>1.4 Work with the WFN to identify context-appropriate ways to address burden of household and care work for women farmers, especially female headed households, which prevents them to increasingly participate and move up along the value chains.</p> <p>2.2.1 Ensure relevant female staff participate in capacity-building activities that are targeted at government officials at national and local levels with regard to climate-friendly agribusiness value chains. – <i>women staff should be prioritized for training.</i></p>	<p>2.1.4 Practical solutions identified and integrated in the project.</p> <p>2.2.1 25% at national level and 20% at local levels women participants (aggregate basis).</p>	PMU MAFF (lead) and PPIUs	Q1 Y2 – Q4 Y6	Covered under training budget for production practices and technologies and PIC (other than civil works) budget
Output 3: Enabling environment for climate friendly agribusiness enhanced					
Gender Objectives 3.1 Institutionalize gender mainstreaming in the climate-friendly agribusiness value chains sector	<p>3.1.1 At project inception, refine the gender analysis for each of the 4 targeted value chains and develop a set of clear policy and program recommendations to strengthen women farmers' involvement along the different value chains. Ensure that capacity is built within MAFF/ Gender & Children Project Support Unit (GCPSU) for gender responsive value chain analysis and develop methodology/guidelines that can be used in future analysis.</p> <p>3.1.2 Integrate key recommendations from the above-mentioned gender analysis of value chains and key features of the MAFF Gender Policy into the Agribusiness policy and other related documents prepared under the project. <i>- This would also mean that gender stakeholders (MAFF GCPSU representatives, gender focal points, and WFN) participate in policy committees and meetings.</i></p> <p>3.1.3 Integrate a session on gender equality in climate-friendly agribusiness value chains (based on gender analysis report mentioned above) into the training and awareness raising activities for relevant project stakeholders (i.e. relevant departments in MAFF, agricultural extension agents, local leaders and government officials, GCPSU and Gender Focal Points, and WFN).</p>	<p>3.1.1 Report prepared with clear recommendations based on detailed gender analysis of the 4 value chains. (Baseline: 0)</p> <p>3.1.2 Key recommendations from gender analysis of 4 targeted value chains integrated in the Agribusiness Policy. (Baseline: NA)</p> <p>3.1.3 Number of sessions provided on gender equality in climate-friendly agribusiness value chains; target groups; number of people trained disaggregated by sex. (Baseline: 0)</p>	<p>International and national consultants under guidance of PMU MAFF</p> <p>PMU MAFF (lead); MOC</p> <p>PMU MAFF (lead) and PPIUs; MOWRAM; WFN</p>	<p>Q1 Y2 – Q3 Y1</p> <p>Q4 Y1 – Q2 Y3</p> <p>Q4 Y1 – Q4 Y6</p>	<p>Covered under policy and standards budget</p> <p>Covered under PIC (other than civil works) budget</p> <p>Covered under PIC (other than civil works) budget</p>

3.2 Enhance access to green finance for women involved in agribusiness value chains	3.1.4 Actively involve the MAFF GCPSU, the sub-national Gender Focal Points (Province, District, Commune), and the WFN and the Agricultural Cooperatives as key partners in project implementation and monitoring, especially for the GAP activities. - <i>This also entails partnering with the WFN as facilitators/resource persons for agricultural extension and technical capacity-building, awareness-raising and information sharing targeted at farmers including provision of market information.</i> - <i>WFN social media pages should be used as one of the ways to disseminate information to women farmers.</i>	3.1.4 MAFF GCPSU, the sub-national Gender Focal Points (Province, District, Commune), the AC and the WFN are aware of the GAP activities	PMU MAFF (lead) and PPIUs; MAFF GCPSU; sub-national Gender Focal Points; WFN	Q2 Y2 – Q4 Y7	Covered under training budget for green finance and PIC (other than civil works) budget
	3.2.1 Raise awareness among women farmers/cooperative members, women-led and/or owned enterprises, and female staff in financial institutions using adequate channels about existing credit facilities, green financing including crop insurance and required formalities to access these	3.2.1 (i) Number and type of activities conducted; (ii) types of communication channels and materials used; (iii) 15 female staff in financial institutions trained in CSA lending and green finance (or 30% of total staff trained are women); (iv) 10 (or 30% of total privately-owned enterprises trained) women-led and/or owned enterprises trained on green finance and CSA; (v) 20,000 women provided with information on climate risk sharing instruments.	PMU MAFF (lead) and PPIUs	Q1 Y2 – Q4 Y6	
Project management gender related activities					
<ul style="list-style-type: none"> PMU to appoint safeguards officer to be responsible and accountable for gender, who will closely liaise with representatives from the MAFF GCPSU at national level and from WFN, Agricultural Cooperatives and gender focal points at provincial levels. (Q1 Y2) Prepare annual work plans to implement the activities of the GAP. (Q1 Y2 – Q4 Y6) Gender consultants (national and international) to be recruited and build capacity of the GCPSU and gender focal points and PMU staff in gender analysis and mainstreaming, and support GAP implementation, monitoring and reporting. (Q4 Y1 – Q4 Y7) Collect and analyze data disaggregated by sex where relevant and integrate gender sensitive indicators (from DMF and GAP) in the PPMS. (Q1 Y2 – Q4 Y7) Ensure regular monitoring and reporting (at least semi-annually to ADB) on the progress of GAP implementation. (Q2 Y2 – Q4 Y7) 			PMU MAFF PMU MAFF PMU MAFF and gender consultants PMU MAFF	See next to each activity	\$249,000 under PIC (other than civil works) budget and government staff budget (M&E)

GAP = Gender Action Plan; GCPSU = Gender & Children Project Support Unit; MAFF = Ministry of Agriculture, Forestry and Fisheries; PMU = Project Management Unit; PPMS = project performance monitoring system; PPMU = provincial project management unit; WFN = Women Farmers Network.

Note*: Women-led and/or owned enterprises = enterprises with at least one of the following (i) at least 50% of senior managers are women, and/or (ii) at least 50% of enterprise ownership is controlled by women, and/or (iii) at least 50% staff are women.

97. **Consultation and Participation Plan.** The project's consultation and participation plan will:

- (i) fully disclose information on the proposed project and subprojects, its components, and its activities with the beneficiary communities and stakeholders;
- (ii) obtain information about the opinions, needs and priorities of beneficiary communities and stakeholders;
- (iii) solicit input and feedback on beneficial and mitigating measures;
- (iv) encourage the participation of beneficiary communities and stakeholders in activities that affect them, such as civil works construction, enterprise support actions, awareness raising activities, and monitoring;
- (v) obtain the consent and cooperation of beneficiary communities and stakeholders for activities required to be undertaken for project planning and implementation;
- (vi) establish a clear, easily accessible and effective grievance redress mechanism; and
- (vii) ensure transparency in all project activities.

98. The various stakeholders, mechanisms for participation, entities responsible, indicative schedules and resources are set out in the Stakeholder Consultation and Participation Plan which is presented separately. The PMU will ensure that IP poor households, women (50% of participants in majority of events) and IP/EM stakeholders are included in the consultation and participation plan activities.

99. **Labor, HIV/AIDs, and other social issues and risks.** The subprojects proposed in the project will have a range of construction and installation contracts. The contractors' presence could increase community exposure to HIV/AIDS, nevertheless the impact of risk from communicable diseases (HIV/AIDS) is low and the impact of other social risks such as human trafficking is not a risk in the locations. The contractors will be obliged to comply with health and safety standards for all infrastructure works during the project life-time. The contractors will need to be compliant with remuneration and gender requirements including equal pay for work of equal value. Employment opportunities for ID-Poor households and women will be available. Wherever feasible the contractor will employ local people to undertake the infrastructure development tasks.

IX. PERFORMANCE MONITORING, EVALUATION, REPORTING, AND COMMUNICATION

A. Project Design and Monitoring Framework

Impact(s) the Project is Aligned with			
Agricultural competitiveness improved (Agriculture Sector Strategic Development Plan, 2014-2018) ^a			
Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
Outcome Productive and resource efficient agribusiness value chains developed in project areas	By 2026 a. At least 15% increase in yields (2017 baseline: rice 2.7 tons, maize 4 tons, cassava 20 tons and mango 15 tons/ha). b. GHG emissions reduced by 240,000 tons of CO ₂ (2017 baseline: 0 tons reduced due to the project). c. At least 50 agribusinesses become more resource efficient in terms of water savings (5-10% efficiencies); energy savings (20%); and reduction in post-harvest losses (10%) (2017 baseline: 0).	a. MAFF agricultural census b. UNFCCC reports c. PPMS reports	Declining demand for Cambodian agricultural products due to competition from external markets and stringent requirements on quality and safety from importing countries
Outputs 1. Critical agribusiness value chain infrastructure improved and made climate resilient	By 2024 1a. 27 irrigation and water management systems targeting 15,000 ha and 25,000 households (with at least 50,000 women) rehabilitated and made climate resilient (2017 baseline: 0). 1b. 800 on-farm rainwater harvesting ponds commissioned (2017 baseline: 0). 1c. At least 250 km of farm road networks upgraded to climate standards to improve connectivity of farms to cooperatives and markets (2017 baseline: 0). 1d. 80 agricultural cooperatives* integrated adaptation measures in post-harvest infrastructure investments (2017 baseline: 5). 1e. Crop product quality and safety testing infrastructure in National Agricultural Laboratory upgraded to test 1500 samples (2017 baseline: 700) and generate service income more than \$75,000 (2017 baseline: \$0). 1f. 12,000 additional biodigesters and 6,000 compost huts made operational, benefiting at least 80,000 persons, including at least 50% women, due to better household air	1a-f. PPMS annual progress reports 1c. MRD annual report 1d-f. MAFF annual progress reports	Capacity constraints for infrastructure design and procurement Climate change impacts may adversely impact project investments Limited attention to O&M of agribusiness infrastructure

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
	quality (2017 baseline beneficiaries: 11,468 persons, including 5,721 women).		
<p>2. Climate smart agriculture and agribusiness promoted</p> <p>3. Enabling environment for climate friendly agribusiness enhanced</p>	<p>2a. Three additional climate resilient varieties of rice and maize released (2017 baseline: 0).</p> <p>2b. 40,000 farmers (of whom 16,000 are women) trained in CSA and agribusiness development skills, of which 50% are SRP compliant with direct links to millers and exporters (2017 baseline for SRP compliance: 0).</p> <p>2c. 27 FWUCs/FWUGs made operational and 500 FWUC/FWUG members (of which 30% women) developed capacity to operate and maintain their irrigation schemes (2017 baseline: 0).</p> <p>2d. 4 provincial agricultural development centers and 4 engineering workshops made fully operational to provide agribusiness services and strengthen farmer value chain linkages (2017 baseline: 0).</p> <p>3a. Climate-smart and gender-responsive agribusiness policy for target commodities, including a PPP framework focusing on agribusinesses formulated (2017 baseline: 0).**</p> <p>3b. CAMGAP for tropical fruit and organic fertilizers endorsed as national standard for tropical fruit and organic fertilizers (2017 baseline: 0).</p> <p>3c. 50 staff, including 30% women, from financial institutions trained in CSA and green finance (2017 baseline: 0).</p> <p>3d. 30 agribusinesses, including 30% women-led and/or owned,*** trained on green finance and CSA (2017 baseline: 0).</p> <p>3e. 20,000 households, including 20,000 women, provided with information on climate risk sharing instruments (2017 baseline: 0).</p> <p>3f. ICT platform for climate friendly agribusiness established in Kampong Cham province (2017 baseline: 0).</p>	<p>2a-d. PPMS annual progress reports</p> <p>3a-f. PPMS annual progress reports</p>	

<p>Key Activities with Milestones</p> <p>1. Critical agribusiness value chain infrastructure improved and made climate resilient</p> <p>1.1 Construct representative subproject for irrigation and confirm implementation plans for rehabilitating and/or developing critical infrastructure for priority value chains (Q1–Q4 2019).</p> <p>1.2 Confirm land availability, locations, suitability, and connectivity for siting processing, storage, marketing and logistics infrastructure (Q1 2019–Q1 2020).</p> <p>1.3 Undertake detailed design, tender and construct critical production and post-harvest infrastructure to climate-resilient condition (Q2 2019–Q3 2024).</p> <p>1.4 Establish management systems for operation and maintenance of infrastructure (Q1 2022–Q3 2023).</p> <p>Output 2: Climate smart agriculture and agribusiness promoted</p> <p>2.1 Deploy climate resilient varieties of rice and maize (Q2 2019–Q2 2024) [G/CD].</p> <p>2.2 Conduct training for farmers, SMEs and private sector on CSA (Q2 2019–Q2 2024) [G/CD].</p> <p>2.3 Establish or upgrade mechanical workshops and training facilities (Q3 2019–Q2 2020).</p> <p>Output 3: Enabling environment for climate friendly agribusiness enhanced</p> <p>3.1 Assist in formulating climate smart agribusiness support including policy and regulations, and advice on agronomy, markets, and links between farmers and the private sector (Q2 2019–Q4 2022) [G/CD, GE].</p> <p>3.2 Conduct training on climate risk management and green finance, including structuring of public private partnerships in agribusiness (Q2 2019–Q1 2024) [G/CD, PSD].</p> <p>3.3 Establish ICT platform for climate risk management (Q3 2020–Q2 2024) [G/CD, PSD].</p> <p>Project Management Activities</p> <p>Mobilize project implementation consultants (Q4, 2018).</p> <p>Establish PPMS, and conduct needs assessment for specific project management skills (Q2, 2019).</p> <p>Provide training courses to project staff in project management, procurement, financial management, gender, social and environment safeguard (Q4 2018–Q3 2024).</p> <p>Inputs</p> <p>ADB: \$90,000,000 (loan)</p> <p>Green Climate Fund: \$40,000,000 (\$10,000,000 loan and \$30,000,000 grant)</p> <p>Government: \$7,376,000</p> <p>Beneficiaries: \$3,664,000</p> <p>Assumptions for Partner Financing</p> <p>Not applicable</p>
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ADB = Asian Development Bank, CAMGAP = Cambodia Good Agricultural Practice, CSA = climate smart agriculture, DMF = design and monitoring framework, FWUC = farmer water user committee, FWUG = farmer water user group, G/CD = governance and capacity development, GE = gender equity, GHG = greenhouse gas, ICT = information and communication technologies, KS = knowledge solutions, PPMS = project performance monitoring system, PPP = public-private partnership, Q = quarter, SME = small and medium enterprises, SRP = sustainable rice platform, UNFCCC = United Nations Framework Convention on Climate Change.

^a Royal Government of Cambodia. 2016. *Agricultural Sector Strategic Development Plan 2014-2018*. Phnom Penh: Ministry of Agriculture, Forestry and Fisheries; Royal Government of Cambodia. 2015. *Cambodia Industrial Development Policy 2015-2025*. Phnom Penh: Council for Development of Cambodia; Royal Government of Cambodia. 2015. *Cambodia Climate Change Strategic Action Plan 2014-2023*. Phnom Penh: National Climate Change Committee.

* Preferential support given to agricultural cooperatives with majority of female members.

**As women are more vulnerable to the impacts of climate change, any policies developed for PPPs or contract farming arrangements for promoting agribusinesses under output 3 are responsive to the needs, constraints and vulnerabilities of women. The detailed gender analysis of the VCs proposed in the gender action plan is expected to inform this process.

*** Women-led and/or owned enterprises = enterprises with at least one of the following (i) at least 50% of senior managers are women, and/or (ii) at least 50% of enterprise ownership is controlled by women and/or (iii) at least 50% of the staff are women.

Source: Asian Development Bank.

B. Monitoring

100. **Project performance monitoring.** A draft project performance monitoring system (PPMS), has been developed (Annex 3) based on the key indicators and targets outlined in DMF. It shall be implemented by the PMU in conjunction with the implementing agencies and support from the PIC in accordance with ADB's Project Performance Monitoring System Handbook within six months of project effectiveness. The PPMS procedures, performance indicators, and their targets will be reviewed and approved by ADB. Benchmark review mainly focusing on secondary data will be conducted. With the help of PIC, the PMU will then undertake every six months quantitative and qualitative project-performance monitoring for each subproject activity to evaluate the delivery of planned facilities and the project benefits that accrued.

101. **Compliance monitoring.** A number of assurances have been given by the government to ensure smooth implementation of the project as reflected in the financing covenants. ADB will monitor compliance with those covenants during project implementation through regular review missions, quarterly progress reports submitted by the PMU, and review of project accounts and procurement procedures.

102. **Safeguards monitoring.** The implementing agencies, assisted by PIC, will prepare and submit to the executing agency semi-annual reports on the environmental impacts identified during implementation. The report will cover environment performance based on implementation of the environmental management plans. The executing agency, through PIC, will be responsible for the consolidation and submission of the reports to ADB in accordance to the format and process described in the IEEs and EARF.

103. LARF details on monitoring and reporting requirements for involuntary resettlement. PMU will be responsible for internal monitoring for the project, which they will conduct in cooperation with monitoring department under the GDR, while an external monitoring agency will be hired to conduct external monitoring and evaluation for involuntary resettlement, if necessary. A summary of the results from these monitoring will feed into the quarterly monitoring reports. During detailed engineering design, the draft social safeguards due diligence report will be updated. If there are any changes, additional land requirements or resettlement impacts are identified, LARP will be prepared by GDR in close coordination with EA and PMU. The LARP will be reviewed by ADB prior to award of civil works and implemented before implementation of civil works. Implementation shall be monitored internally by GDR and EA with support of PMU. During LARP implementation, the monitoring results shall be consolidated into semiannual monitoring reports and shared with ADB for review, clearance and disclosure on ADB and EA's websites. Once LARP implementation is completed, semi-annual monitoring reports will be prepared and submitted to ADB for review and clearance. Upon clearance of monitoring reports by ADB, these will be disclosed by uploading on MAFF and ADB websites. PMU will be adequately staffed with social safeguards and resettlement specialists.

104. **Climate change.** The overall project is categorized as medium. However, it was rated high as per the AWARE risk screening tool. It is therefore important that the PIC responsible for infrastructure development and capacity building have sufficient climate change experience and capability to ensure and maximize adaptation possibilities, promote climate smart agricultural practices, and ensure that the project satisfactorily ensures that farmers are aware of the risks and the steps they can take to adapt.

105. **Gender and social dimensions monitoring.** Sex-disaggregated data will be collected wherever relevant and gender specific and sensitive indicators (from the DMF and GAP) will be

integrated as part of the PPMS. The progress of gender and social activities and targets outlined in the GAP will be monitored and reported regularly (at least semi-annually) by the PMU together with the project progress reports; the template to be used for GAP monitoring and reporting is included as Annex 4. Achievement of performance indicators of the GAP outlined in the DMF will be updated semi-annually in the PPMS.

C. Evaluation

106. ADB will conduct regular (i.e. at least twice per year) reviews throughout project implementation to (i) assess the progress of project activities and outputs and effectiveness of implementation arrangements; (ii) monitor safeguard compliance with ADB Safeguard Policy Statement (2009); (iii) review compliance with loan and grant agreements and related matters; (iv) follow up on decisions and actions agreed during previous review missions; and (v) resolve any project implementation issues that may arise.

D. Reporting

107. MAFF PMU will provide ADB with (i) quarterly progress reports in a format consistent with ADB's project performance reporting; (ii) consolidated annual reports including (a) progress achieved by output as measured through the indicator's performance targets, (b) key implementation issues and solutions, (c) updated procurement plan, and (d) updated implementation plan for the next 12 months; and (iii) a project completion report within six months of physical completion of the project. To ensure that the project will continue to be both viable and sustainable, project accounts and the project's audited financial statement together with the associated auditor's report should be adequately reviewed.

E. Stakeholder Communication Strategy

108. A stakeholder communication strategy has been prepared to ensure that vulnerable groups, such as the poor and female-headed households, who risk marginalization, are provided with opportunities for receiving timely information, and can provide feedback during project implementation. Table 16 explains further on what project information will be communicated, the means of communication, who will provide the information, the audiences and the frequency.

Table 16: Stakeholder Communication Strategy

Objective	Stakeholder Group	Function/Interest in Project	Messages	Means of Communication	Timeline	Responsibility	Resources
1. Ensure a good 2-way flow of information, and promote ownership over subproject activities and climate-friendly agribusiness value chains sector development	Beneficiary farming communities including women and men farmers, collectors, contractors and local rice millers, Village Chiefs, Assistants to Village Chiefs, Commune Councils, Women and Children Focal Points, farmer cooperative members, local micro-credit institutions.	Direct beneficiaries of project; local authorities participating in implementation and follow-up of sub-projects; beneficiaries of improved water management systems and maintenance, participants in agribusiness enterprise development; participants in technical and irrigation training, in workshops and study tours and skills and employment training.	<p>Local collaboration and support is fundamental to project effectiveness; information is to be shared openly and transparently; inputs into design and recommendations for improvements are welcome.</p> <p>Clear information on implementation arrangements and schedule of civil works.</p> <p>Updated on subproject progress and roles for any operation and maintenance after completion.</p> <p>Planned mitigation measures (including compensation rates, entitlements, grievance redress mechanism, road</p>	<p>The project will produce user-friendly posters at local level giving information about when consultation meetings are to be held, and showing subproject plans and activities. Details of how and where to register feedback (e.g. with Village Chief and Commune Women and Children Focal Point) is to be provided.</p> <p>Regular meetings between implementing agency & beneficiaries will be held every month for two-way flow of information about project activities, priorities and progress. Feedback from meetings will be logged, and feedback on follow-up actions will be reported at the following meeting. Village Chief, Asst. to Village Chief, Commune Council members,</p>	<p>Regular ongoing information exchange between IA and beneficiaries prior to initiation of activities.</p> <p>During initial phase of subproject preparation.</p> <p>During detailed project design phase.</p> <p>At kick-off workshop/meeting when project is launched</p> <p>Ongoing during implementation of activities and any civil works.</p> <p>At completion in closing workshop at local level</p>	<p>IA, MAFF, Provincial Department of Agriculture and other related ministries and departments, local government including commune council, Village Chief, Asst. to Village Chief and Women and Children Focal Point.</p> <p>Responsibility for producing information materials will be with IA.</p> <p>Responsibility for identifying best publicly accessible places is with Village Chief</p>	Refer to Output 2, sub-output 2.2 (Capacity Enhancement) for source, of funding for production of all communication materials and recruiting local communication service provision necessary

Objective	Stakeholder Group	Function/Interest in Project	Messages	Means of Communication	Timeline	Responsibility	Resources
			safety and noise/pollution control measures before and after construction).	<p>Commune Women and Children Focal Point etc. will receive orientation from project staff regarding what to do when local community members give them feedback on subproject.</p> <p>Standard reporting formats to be used by local authorities and IA for providing project updated to beneficiaries on a regular basis so that information can be systematically transmitted to communities.</p> <p>Public information meetings, including regular updated by Village Chief, Assistant to Village Chief, Women and Children Focal Point and Commune Council members at village level following any visits and meeting with IA and project consultants.</p> <p>Resettlement committee meetings (if</p>			

Objective	Stakeholder Group	Function/Interest in Project	Messages	Means of Communication	Timeline	Responsibility	Resources
				<p>necessary) and/or meetings with any affected households.</p> <p>Printed information about subproject in local language posted in accessible public areas, including information on how to provide comments or register grievances.</p> <p>Posters on information boards on upcoming training programs for agribusiness, technical training, skills training for employment, and small and micro-enterprise development.</p>			
2. Ensure a good 2-way flow of project information to women beneficiaries and ethnic minority beneficiaries (if applicable).	Women, poor and vulnerable households, ethnic minority groups (if applicable)	As above	As above plus disseminate contents of GAP and EMDP (if applicable), and opportunities to participate in training in income generating activities.	<p>Separate meetings with women organized through Women and Children Focal Point, and ii) with ethnic groups in local language if applicable.</p> <p>Printed information about the project posted in local and accessible language (or visual</p>	As above	As above	

Objective	Stakeholder Group	Function/Interest in Project	Messages	Means of Communication	Timeline	Responsibility	Resources
				<p>depictions) posted in accessible public areas.</p> <p>Designation and provision of materials/toolkit to Women and Children Focal Point for promotion/coaching in micro- and small enterprise development and disseminating information about agribusiness opportunities from IA / project consultants</p>			
3. Raise visibility and awareness of benefits of agribusiness development for inclusive growth and for building ownership over ongoing infrastructure development (e.g. irrigation O&M, and agriculture operations) and also agriculture cooperative development.	Beneficiary communities.	Direct and indirect beneficiaries of project.	Project investments and agribusiness promotion is beneficial to local economy, culture and gender equity.	<p>Media press releases and coverage about the project by local media –print, radio, and TV features (if possible).</p> <p>Signboards promoting visibility of MAFF, ADB and local government collaboration for climate friendly agribusiness and value chain development and improvements.</p> <p>Inaugurations of completed civil</p>	<p>At project launch and midi-way through as tangible results are realized.</p> <p>Signboards at appropriate locations at the start of construction and through project implementation.</p>	IA and provincial department of Agriculture and local authorities	

Objective	Stakeholder Group	Function/Interest in Project	Messages	Means of Communication	Timeline	Responsibility	Resources
				<p>works with promotional events at subproject sites.</p> <p>MAFF Web site about project activities, progress and documents.</p>			

Objective	Stakeholder Group	Function/Interest in Project	Messages	Means of Communication	Timeline	Responsibility	Resources
4. Ensure a good 2-way flow of project information to promote public-private partnerships for inclusive agribusiness growth and value chain development	Private sector agribusinesses, and local Chambers of Commerce	Direct and indirect beneficiaries of project; partners in development activities.	Promote participation in agribusiness initiatives which will increase available supply of good quality produce, employment creation and initiatives to promote climate friendly agribusiness value chain development	Partnership in workshops / meetings / surveys on agribusiness development and marketing / promotion programs. Production of a full suite of marketing materials designed by local consultant	Ongoing during implementation of project activities	MAFF / project consultants	Refer to output 2.2 – Capacity enhancement
	Crop centric PPP forums	Mango, cassava and maize value chain players			Twice a year	PMU to arrange with Project Director to be secretary and MAFF to chair	Output 2.3 will support the inter-ministerial committee on PPP initiatives and the crop centric forums
	Inter-ministerial committee on PPP initiatives	MAFF, CDC & other relevant ministries with value chain federations and association members	Related to PPP initiatives	Minutes of meetings and follow up with concerned government agencies	Once every 2 months		

Objective	Stakeholder Group	Function/Interest in Project	Messages	Means of Communication	Timeline	Responsibility	Resources
5. Ensure a good 2-way flow of project information and promote women's ownership over subproject activities and agribusiness development.	MAFF GMAG (Gender Mainstreaming Action Group) including Women Farmers Network	<p>Responsible for promoting gender equality and mainstreaming gender in agriculture sector</p> <p>Plays a major role in overseeing gender inclusiveness in agricultural development in Cambodia</p> <p>Promote women's involvement and participation in micro and small enterprise development and employment training in the agriculture sector.</p>	<p>Key benefits, and gender equity of subproject activities and climate friendly agribusiness and value chain development</p> <p>Specific benefits targeted to women</p> <p>Disseminate information on progress on gender equity</p>	<p>National Steering Committee and Provincial meetings.</p> <p>Regular coordination meetings between IA Gender consultants and MAFF GMAG and Women Farmer Network for implementing project GAP and recommending any improvements</p>	From outset of project and regularly throughout project lifetime.	Project Gender Consultants and MAFF GMAG	
6. Ensure a regular flow of project information and promote collaboration to complete project civil works.	MAFF Province and District staff; Government officials, contractors, and communities in the project areas.	Responsible for implementation and O&M of infrastructure subprojects and civil works.	<p>Project design, key project benefits, implementation arrangements and schedule of civil works</p> <p>Main project impacts (positive and negative).</p> <p>Planned operation and maintenance measures.</p>	<p>National Steering Committee and Provincial Committee Meetings.</p> <p>Regular coordination meeting for detail design of civil works, and implementation of project activities.</p>	From outset of project and throughout implementation.	IA	

Objective	Stakeholder Group	Function/Interest in Project	Messages	Means of Communication	Timeline	Responsibility	Resources
				Regular flow and sharing of documentation. Project website.			
7. Ensure understanding of project impacts, outcomes and outputs and importance of theme of inclusive growth.	Beneficiaries; MAFF; local authorities such as Commune Chiefs and Commune Council members (Commune authorities will receive orientation to develop their understanding for project impacts)	Responsible for project implementation	Effective execution of their tasks, regular follow-up, monitoring and reporting progress and constraints is important for project success. Community collaboration and inclusive approach is essential to effective project delivery.	Dissemination of National Steering Committee decisions and strategic documents. Training in project management and other institutional strengthening activities. Formats and simple chart (s) showing responsibilities for project implementation, flow of funds, flow of activities, monitoring and follow-up. Project web-site (managed under auspices of MAFF website) - PPTA already has a Facebook page, regular email updated on project activities and relevant developments in agribusiness.	From outset of project and throughout implementation.	IA	

Objective	Stakeholder Group	Function/Interest in Project	Messages	Means of Communication	Timeline	Responsibility	Resources
				<p>Sharing of information on project budget allocations; transparent process for selection for study tours, regional visits and other benefits and institutional strengthening activities.</p> <p>Gender and EMDP implementation training.</p>			

CDC = Council for the Development of Cambodia; EMDP = Ethnic Minority Development Plan; GAP = gender action plan; GMAG = Gender Mainstreaming Action Group; IA = implementing agency; MAFF=Ministry of Agriculture, Forestry and Fisheries; O&M = operation and maintenance; PMU = project management unit; PPP = public-private partnership

X. ANTICORRUPTION POLICY

109. ADB reserves the right to investigate, directly or through its agents, any violations of the Anticorruption Policy relating to the project.¹⁵ All contracts financed by ADB shall include provisions specifying the right of ADB to audit and examine the records and accounts of the executing agency and all project contractors, suppliers, consultants, and other service providers. Individuals and/or entities on ADB's anticorruption debarment list are ineligible to participate in ADB-financed activity and may not be awarded any contracts under the project.¹⁶

110. To support these efforts, relevant provisions of the ADB's Anticorruption Policy are included in the financing agreement and the bidding documents for the project. The project design and implementation arrangements provide for mitigation of corruption risks. Risks associated with project management, including procurement and disbursement, will be mitigated by the engagement of PIU to advise and assist in the procurement of goods and services, and the engagement of other consultants. The project will also establish a website in which it will disclose implementation progress, bid notifications and their results, and provide grievance mechanism against any corrupt practice. References on ADB's Anticorruption Policy can be accessed through the following link: <http://www.adb.org/integrity/>. Guidelines on governance and anticorruption action plan are also available.¹⁷

XI. ACCOUNTABILITY MECHANISM

111. People who are, or may in the future be, adversely affected by the project may submit complaints to ADB's Accountability Mechanism. The Accountability Mechanism provides an independent forum and process whereby people adversely affected by ADB-assisted projects can voice, and seek a resolution of their problems, as well as report alleged violations of ADB's operational policies and procedures. Before submitting a complaint to the Accountability Mechanism, affected people should make an effort in good faith to solve their problems by working with the concerned ADB operations department. Only after doing that, and if they are still dissatisfied, they then approach the Accountability Mechanism.¹⁸

XII. RECORD OF CHANGES TO THE PROJECT ADMINISTRATION MANUAL

112. All revisions and/or updates during the course of implementation should be retained in this section to provide a chronological history of changes to implemented arrangements recorded in the PAM.

¹⁵ ADB. Anticorruption Policy: <http://www.adb.org/Documents/Policies/Anticorruption-Integrity/Policies-Strategies.pdf>

¹⁶ ADB's Integrity Office web site: <http://www.adb.org/integrity/unit.asp>

¹⁷ ADB. Governance and Anticorruption Action Plan II Guidelines. <http://www.adb.org/Documents/Guidelines/GACAP-II-Guidelines.pdf>. See also Sourcebook: Diagnostics to Assist Preparation of Governance Risk Assessments. <http://www.adb.org/documents/books/Diagnostics-to-Assist-Preparation-of-GRAs/default.asp>.

¹⁸ ADB. Accountability Mechanism. <http://www.adb.org/Accountability-Mechanism/default.asp>.

IMPLEMENTATION PROCEDURES

A. Implementation Arrangements per Project Outputs

1. **Output 1: Critical agribusiness value chain infrastructure improved and made climate resilient.** Include the following key activities:

2. *Activity 1.1. Rehabilitating water management infrastructure to climate resilient condition:*

The lack of irrigation systems, surface and ground water extraction infrastructure restricts most farmers to a single rainfed crop per year, while poor on-farm water management is constraining production. High rainfall variability and expected changes in rainfall regimes from climate change are expected to exacerbate this situation. Under this activity, at least 27 irrigation and water management systems are rehabilitated and modernized to become climate resilient. The improved infrastructure will cover a minimum of 15,000 ha under irrigation command and will benefit at least 25,000 households. At least 60% of these households will then have the capacity to have sufficient water resources to irrigate a second crop and 30% of households, a third crop. Several potential subproject investments have been screened by the PPTA consultants.

3. Critical design features contributing to climate resilience include (i) enhanced storage capacity; (ii) improved regulation of flow rates, including adequate flow capacity of regulators and other structures to prevent or reduce scour; (iii) improved water allocation within the command area, including division of the command area into compartments to allow for orderly cultivation of a part of the area in case of water shortage; (iv) concrete lining of distribution canals to reduce the seepage losses; (v) enhanced flood resilience; and (vi) improved drainage and salinity control (in affected areas). In addition, climate resilience in infrastructure interventions can be enhanced by the following measures: (i) high overall efficiencies (high output per m³ of water); (ii) optimal balance between water demand and water availability; (iii) limited reliance on pumping; (iv) predictable and reliable water allocation over time and within the scheme; and (v) effective cooperation between farmer water user groups (FWUGs) in terms of sharing knowledge about management options, covering both cultivation and water management.

4. The selection criteria applied were, the subproject:

- (i) Is an existing small to medium scale irrigation system with good balance between water demand and raw water availability;
- (ii) The command area of the subproject should be sufficient to demonstrate climate change adaptation measures (improved technical design, enhanced water used efficiency, good agricultural practices, and improved water use governance), and to ensure that the subproject would be more climate resilient than its current status.
- (iii) Should have strong political and community ownership in terms of commitment to implement climate change adaptation measures and ensure effective operations and maintenance (O&M);
- (iv) Is not supported by other ongoing or proposed development projects financed by ADB or other development partners;
- (v) Has existing farmer water user group (FWUG) or farmer water user community (FWUC) or is ready for registration;
- (vi) Should involve rehabilitation of both primary canals and distribution canal networks (secondary and tertiary canals) to ensure that water reaches the farms, with minimum water loss;
- (vii) Has low irrigation efficiency and low water productivity, and scope for improvement, with sufficient water resources;

- (viii) Should have viable economic returns (a minimum economic internal rate of return of 12%) and a realistic and technically viable O&M plan;
- (ix) Should be category B or C for involuntary resettlement, environmental impact and ethnic minority;
- (x) Should have high potential for cluster (cooperative) development and include vulnerable communities, poor and women farmers as beneficiaries.
- (xi) Should enhance capacity of the beneficiaries to operate and maintain irrigation schemes sustainably with little or no external intervention other than the normal extension services.

5. At least 800 on farm surface water catchment ponds will be dug and commissioned. Each pond will be used for supplementary irrigation not only for the target crops but will be used for more intensive horticulture and tree crop production and will be sited to collect surface run-off and have sediment traps to avoid excessive sedimentation. Selection criteria applied were:

- (i) The recipient must be a smallholder willing to work with the project to implement climate resilient agricultural practices associated with surface water catchment;
- (ii) The recipient must have a land title, or equivalent;
- (iii) Preference is given to female headed households;
- (iv) The plot of land has problems relating to excessive rainwater run-off or drainage channels or gullies running through the plot, both of which can be “tapped” to provide supplementary irrigation;
- (v) The smallholder can show that there will be benefits to intensive agricultural production through using of the pond as a supplementary irrigation source;
- (vi) The farmer commits not to sell or transfer the land to a third party during the life of the project, to ensure capital gain;
- (vii) The farmer commits to contribute to necessary O&M of water catchment pond; and
- (viii) If required, the farmer has no objection for his or her farm to be used as a training and demonstration location for the duration of the project.

6. The project will support establishment of drip irrigation demonstration units on mango farmers’ land mainly in Kampot and Takeo provinces.¹⁹ The demonstrations will be used for training of not only the recipient farmer but also for surrounding mango farmers and MAFF nominated training of trainers. So far, there are no mango producers and marketing associations in the target provinces. It is hoped that through meetings at the demonstrations and field days, a producers’ association can be created. The demonstrations on drip irrigation will also involve the use of solar energy for pumping, wherever feasible. The use of solar energy is expected to reduce overall energy costs in operating the drip irrigation scheme. The selection criteria for drip irrigation demonstration sites include the following, the recipient:

- (i) Must be a smallholder and not an absentee farmer;
- (ii) Must have a land title, or equivalent;
- (iii) Has marketing contacts that require Grade A fruit or has the potential of gaining such contracts;
- (iv) Must grow the *Keo Romeat* mango variety or other climate resilient varieties that are amenable to floral manipulation and have market potential
- (v) Has access to the water or water is available for a borehole and pond construction (if of sufficient size or replenishment to satisfy the water demands of irrigating mango);

¹⁹ MAFF has requested at least one demonstration drip irrigation unit to be located in Kampong Speu province which borders Takeo and is the most important mango producing province in the east of the country.

- (vi) Is willing to work with the project and accepts the technical innovation of drip irrigation and solar pumping;
- (vii) Commits not to sell or transfer the land to a third party during the life of the project, to achieve capital gain and; and
- (viii) Has no objection for his or her farm to be used as a training and demonstration location for the duration of the project.

7. Activity 1.2 Upgrading agricultural cooperative value chain infrastructure (drying, processing and storage facilities) is aimed at strengthening the agricultural cooperative value chain infrastructure. Currently the drying, storage, and processing facilities at agricultural cooperatives are rudimentary and are highly vulnerable to impacts of climate change. The drying process is undertaken on the ground, over tarpaulin. For instance, in case of cassava chips, a stable product is attained when the moisture content is below 14%, as anything higher leads to black spot and molds, as well as a reduction in the starch percentage. In terms of cleanliness, gravel and dirt in the sample can be problematic for the traders and processors. If not processed within 4 days, the roots of fresh cassava will deteriorate. Humidity and high temperatures in storage negatively impacts the quality of the product, and can also encourage the appearance of insects, pests and diseases. In addition to poor post-harvest management, infrequent and unexpected rainfall increases the exposure of harvested crops to humidity, leading to the development of aflatoxins, and resulting in food safety threats to the whole food chain.

8. The project will support selected agricultural cooperatives by installing 50 (12 units), 100 (44 units) or 200 (24 units) ton cleaning, drying and storage units. The size of the storage will depend on the crop commodity or the trade that the cooperative deals in seed grain, grain for processing or cassava chips. The objectives of such support are to: (i) reduce post-harvest losses; (ii) manage the grain or cassava chip materials and its moisture content particularly in the rainy season; (iii) ensure a better price by providing delivery flexibility to processors within the value chain; and (v) encourage processors and buyers to form linkages with cooperatives to stabilize supply and demand. Storage units will be climate-proofed by considering current climate variability and projected climate change extremes and associated pests and diseases. The measures will include providing for improved aeration, drainage and runoff management, humidity control, pest control, and waste management. In addition, solar power will be introduced within the stores for ventilation and drying, lighting and powering management systems. Energy efficiency measures will be implemented in the infrastructure for drying, processing and storage to reduce carbon emissions from fuel wood currently used to operate these facilities. The cooperatives will be prioritized as per eligibility criteria:

- (i) The cooperative must be registered for more than a year and is able to access loans;²⁰
- (ii) The cooperative stores seed and/or is trading or has a business plan (that includes O&M) to develop a trading agribusiness with potential downstream value chain linkages;
- (iii) It should have at least 1,000 m² land available or planning to buy similar area;
- (iv) It should have a reserve fund, with preference to those reinvesting at least 10% above the minimum legal requirement of 20% gross profit (the minimum stipulated in the Law on Agricultural Cooperatives 2013) into the reserve fund;

²⁰ Agricultural cooperatives can be registered with MAFF and those that have access to formal financing. The Rural Development Bank will support those cooperatives with good management and business plans with loans, this is a recent move (June 2016) and is backed by an AFD guarantee which commits to cover 65% of any losses; average loan size \$5,000.

- (v) The cooperative should have strong commitment to implement climate change measures to reduce vulnerability to impacts of climate change and reduce carbon footprint of its operations through promoting bioenergy (biodigesters), renewable energy (e.g., solar roofs) and improving energy efficiency.
- (vi) It should have strong commitment of cooperative management team and approved by at least 2/3 of members as detailed in Article 43 on the Law of Agricultural Cooperatives.²¹ However, the 2/3 majority will be for all members and not just those attending general meetings;
- (vii) The cooperative should develop a realistic and technically viable O&M plan for post-harvest and renewable energy infrastructure at the cooperative;
- (viii) There is full social and gender inclusion within its membership;²² and
- (ix) The area under cooperative primarily grows rice, maize and/or cassava.

9. Activity 1.3 Improving connectivity to cooperatives and markets through climate resilient farm road networks provides access to markets and road networks by improving rural roads and tracks within communes for at least 250 km with a mix of gravel or concrete bases depending on the traffic volumes and community needs. It will focus on linking the proposed cooperative storage and drying units in two ways: (i) linking farm units and the production zones to the storage units; and (ii) connectivity of the stores to all-weather and or climate resilient roads, the latter being more durable structures to tolerate heavy transport and delivery trucks.

10. During the feasibility study, three climate resilient design features were considered: (i) increasing embankment heights; (ii) providing cross drainage; and (iii) selecting embankment materials suitable for increased permeability. In addition, green planting (bioengineering) has been considered for strengthening embankments for road sections that are exposed to higher risk of damage due to flooding. Regarding increased embankment heights, an average 0.2 m design height above the conventional road design height has been adopted. However, this will be reconfirmed during the detailed engineering design stage based on detailed hydrological data. As for cross drainage, the preliminary design has considered the adequacy of existing structures (pipe and box culverts, and small bridges of single span, as there are no larger bridges) and has included readjustments with additional structures for strengthening cross drainage. This again will be reconfirmed during detailed engineering design while refurbishing the existing structures for their optimal use. For embankment materials, laterite has been cost optimal, again to be reconfirmed during detailed engineering design, especially for road sections that are exposed to higher risk of damage due to flooding.

11. In addition to improving climate resilience of farm roads in target provinces, the project will strengthen capacity of the Ministry of Rural Development (MRD), and the Provincial Departments of Rural Development (PDRD) to develop guidelines for improving climate resilience of rural infrastructure. In cooperation with MRD, the project will also build capacity of civil engineers in design, construction, maintenance and climate proofing of rural road networks. Operations and maintenance costs will be jointly borne by MRD and the communities. Selection criteria include the following:

²¹ Article 43: decisions relating to statute, internal regulations, division, amalgamation or dismissal of members shall be made by two thirds majority of votes of members present in the general meeting. Other decisions of the general meeting shall be made by majority of votes of members present.

²² USAID. 2014. Measuring Progress Toward Empowerment: Women's Empowerment in Agriculture Index: Baseline Report. A 2012 survey in 13 countries, including Cambodia, and included 2,100 households in 84 villages across 17 districts showed that Cambodia achieved the highest score. The study noted that 92.6% of women achieved adequate empowerment and that 94.7% of the women had achieved gender parity, but the indicator which contributed most to disempowerment for women was 'group membership'.

- (i) Should be an existing road connecting farms to the existing agricultural cooperative or other agricultural market center;
- (ii) Should complement ADB's past, ongoing and future interventions and provide the potential for higher economic growth by reducing transport costs for the movement of farm produce to agricultural markets;
- (iii) Should have a strong political and community commitment to implement adaptation measures and support a realistic and technically viable O&M plan;
- (iv) Should be consistent with MRD's priorities for rural development and decentralization;
- (v) Should be Category B or C for involuntary resettlement, ethnic minority / indigenous people, and environment;
- (vi) Should achieve the economic threshold limit of 12% for the economic internal rate of return; and
- (vii) Must have at least 40% female beneficiaries.

12. Activity 1.4 Strengthening infrastructure for agricultural quality and safety testing at the National Agricultural Laboratory (NAL). The newly inaugurated Plant Biotechnology Laboratory (PBL) will be supported; no building is required as the sanitary and phytosanitary measures (SPS) and Plant Protection Unit will be moving from the existing laboratory building to a new building; however, some building redesign and reorientation is required to satisfy future International Standards Organization (ISO) 17025 accreditation. The activities will include: (i) establishing genetically modified organism (GMO), plant toxins, bio-fertilizer and organic fertilizer testing capacity; (ii) supporting ISO 17025 accreditation; (iii) developing tissue culture protocols for banana and cassava;²³ and (iv) assisting the laboratory commercialization process to achieve partial cost recovery. The project will supply analytical testing equipment for GMO analysis and bio-fertilizer and organic fertilizer testing, the supply of tissue culture equipment and materials that will include making the tissue culture laboratory aseptic and the supply of growth media, etc. and plantlet weaning facilities. Pesticide residue rapid test kits for field testing and desktop testing equipment for plant toxins will also be supplied. The main strategy will be to gain ISO 17025 accreditation for the range of tests supported by the project but also those tests in which NAL feels confident that accreditation can be achieved. The other targets are for PBL to generate revenue at least \$75,000 per annum by year 6 and to license tissue culture technology to two companies. On matters of biosafety and biotechnology policy and standards, as well as upgradation of the laboratory infrastructure and capacity, biosafety experts from the Ministry of Environment (MOE) will be involved.

13. Activity 1.5 Promoting renewable energy) biodigesters and use of solar energy in target cooperative areas) for value chain improvement includes (i) installation of at least 12,000 more biodigesters in target agricultural cooperative areas by the sixth year from a baseline figure of 11,468 units, benefitting 80,000 persons including 40,000 females; (ii) supporting the construction of 6,000 compost huts, to process bio-slurry; and (iii) establish a national framework on the biodigester quality (standard development) and harmonize biogas initiatives in a private sector friendly manner. As noted under Activity 1.2, the project will also promote the use of solar energy within post-harvest and processing units at cooperatives. Likewise, photovoltaic energy will be used in the submersible pumps to supply water to the drip irrigation demonstration sites under activity 1.1. The quality of solar systems will be ensured through using certified companies and products.

²³ The laboratory is already working in developing Banana TC protocols.

14. The target provinces are endowed with a relatively high animal population (860,000 cattle and 550,000 pigs) and represent around 27% of the total biodigester potential of whole Cambodia. The National Biodigester Program (NBP) estimated biodigester potential for the country as 1 million. The total number of installed biodigesters under NBP reached 25,383 country-wide in 2016 (of which 2,835 in Kampong Cham, 34 in Tboung Khmum, 3,515 in Kampot and 4,101 in Takeo), far below the anticipated target and well beneath the country's potential.²⁴ The biodigester potential has been estimated at 268,000 units in the four target provinces, but the project will support only 12,000, subject to meeting strict selection criteria such as counterpart funds, memberships in agricultural cooperatives, etc. The project will improve health and productivity for 40,000 women due to better household air quality and by averting 648 additional disabilities adjusted life-years and 14 less premature deaths. Beneficiary households will be required to provide cofinancing prior to the installation of the digesters. In line with the operational modalities of the NBP, the project will provide a flat rate subsidy of \$150, independent of the size of the biodigester.

15. The project will promote bio-slurry management and storage, including the introduction of 6,000 standardized compost huts with a durable roof and improved user training on slurry management. According to the NBP, a compost hut with brick wall and a long-lasting roof made of corrugated iron is relatively expensive and costs around \$200. As this investment comes on top of the investment in a biodigester, most farmers will not be able to afford it. To alleviate some of the additional investment, it is proposed to provide an incentive of \$100 per standardized compost hut. It is expected that around 50% of the farmers will invest in such a compost hut, a significant increase compared to a baseline of 15%.

16. The biodigesters are expected to reduce greenhouse gas (GHG) emissions through three pathways: (i) substitution of non-renewable cooking and lighting fuel by a renewable fuel (biogas), (ii) reduction of methane emissions from manure by capturing and burning methane for thermal energy (cooking and lighting) and (iii) displacement of chemical fertilizers by bio-slurry. The design criteria of biodigesters include: (i) durability, reliability and maintenance requirements; (ii) local availability of construction materials; (iii) appropriateness of the design for areas with high water tables; and (iv) costs. The selection criteria for households eligible for a biodigester include the following:

- (i) Commune members who are located within the catchment area of those agricultural cooperatives supported by the project;
- (ii) Households having at least 15 kg manure available daily and a maximum of 150 kg per day;
- (iii) Commitment to adopt climate smart and good agricultural practices such as composting, mulching, organic agriculture, climate resilient varieties;
- (iv) Preference to female headed households and those committing to a realistic and technically viable O&M plan;
- (v) Preference to households with presence of respiratory related illnesses due to air pollution or those households at risk that use biomass for cooking;
- (vi) Preference to households with capacity to contribute funds either by having own funds or taking loans; and
- (vii) Commitment to use bio-slurry as a fertilizer substitute.

17. The project will also advise agribusinesses to reduce energy costs and support those that are prepared to invest in solar energy through: (i) sponsoring feasibility studies on the potential

²⁴ Government of Cambodia. National Biodigester Program. <http://nbp.org.kh/ProgrammeArea.aspx>.

for photo voltaic energy to reduce energy costs in the value chain; (ii) providing advice to at least 10 agribusinesses that have the potential to reduce energy costs with photovoltaic energy; and (iii) linking of such agribusinesses with the green financing interventions.

18. **Output 2: Climate smart agriculture and agribusiness promoted.** Under this output three key activities include deployment of climate resilient varieties, capacity strengthening for climate smart agriculture (CSA), and promotion of farm mechanization.

19. Activity 2.1 Deploying climate-resilient varieties. Yields of target crops grown currently in the four targeted provinces are adversely impacted by climate change. The project will support the Cambodian Agricultural Research and Development Institute (CARDI) to trial and release climate resilient rice and maize varieties including seed production and multiplication,²⁵ in cooperation with the International Rice Research Institute (IRRI). The varietal characteristics or traits that will be selected will include tolerance to higher temperatures, drought, prolonged submergence as well as the release of varieties with shorter cropping cycles. This will not be a basic plant breeding program which will take 10 years to develop. CARDI and IRRI already have over 200 climate resilient lines that can be trialed within a 5-year program that includes continued selection, agro-climatic adaptation, climate resilient trait evaluations, yield comparisons and farmer and processor evaluation. The project will also support large scale seed multiplication of climate resilient varieties for each target crop in target provinces and distribution of quality seed to farmers. For example, new rice varieties suitable for direct seeding, and for alternate wetting and drying technologies will be demonstrated together with the full technology package on about 100 hectares in each target province. The project will recommend standards for seed certification procedures for different grades of seed, and seed certification procedures for the approval of and implementation by the government.

20. Technical assistance will also be provided to CARDI to develop a commercialization program with recommendations on the legal framework to develop intellectual property rights and partial cost recovery for the institution. The expected results will be: (i) at least two climate resilient rice varieties released for commercial production and one climate resilient glutinous maize variety released for commercial production; and (ii) CARDI would be able to achieve partial cost recovery in variety development and foundation seed supply with the corresponding legal framework in place.

21. Activity 2.2 Strengthening capacity in climate friendly production practices and technologies. Utilizing some of the infrastructure developed under output 1, the project will strengthen capacity of farmers, cooperatives and agribusinesses on CSA and climate friendly practices. The lack of access to reliable extension services and the absence of climate information services prevent farmers from not only developing into professional agricultural cooperatives, but also from effectively coping with climate change. On the other hand, CSA, when combined with investments in rural infrastructure and inputs offers significant potential to increase yields to a profitable and sustainable level. For example, the combination of sound CSA practices with improved germplasm has the potential to increase yields for premium aromatic rice to 4.5t/ha, aromatic rice 5.5t/ha and white rice 6t/ha, for maize 8-10t/ha and for cassava above 40t/ha, while CSA combined with drip irrigation in mangoes can increase yields by 30%.

²⁵ CARDI is the semi-autonomous government research agency responsible for increasing agricultural productivity, improving crop diversification and ensuring environmental sustainability and stability of rural livelihoods through agricultural research and technology utilization.

22. Under this activity, the project will support the deployment of a farmer-oriented training program on CSA, reaching at least 40,000 farmers (16,000 women), focusing on the rice, cassava, maize and mango value chains. The project will train youth, landless and women. Farmers, FWUCs, agricultural cooperative boards and their members, and government officials from the Provincial Departments of Agriculture, Forestry and Fisheries (PDAFFs) will receive both formal training and on-farm demonstrations on the following topics:

- (i) CSA practices, including laser land levelling, alternate wetting and drying, sustainable agricultural waste management, rational use of inputs (water, energy, fertilizers, and pesticides), agro-forestry and soil cover maintenance techniques, anti-erosive landscaping, and other practices leading to reduction of GHG emissions;
- (ii) Standards compliance such as CAMGAP and sustainable rice platform (SRP). The project will prepare training manuals and materials for SRP standards for sustainable rice cultivation, for CSA, and for CAMGAP for tropical fruit.
- (iii) Agricultural cooperative management and business development plans including bookkeeping, accounting and the importance of access to crop value chains and marketing;
- (iv) Management and operation of provincial agricultural development centers and mechanization workshops for government staff (see Activity 2.3); and
- (v) Management, operation and maintenance (O&M) of irrigation infrastructure, drying and storage units for maize, rice and cassava as well as all other infrastructure.

23. Building on experiences of ADB's Climate Resilient Rice Commercialization project, and in collaboration with institutions such as IRRI, the project will support laser land levelling up to 4,000 ha (approximately 1,000 ha per province) to improve water use efficiency and enhance crop yields in selected climate resilient irrigation and water management systems supported by the project under output 1. Besides reducing labor costs and greenhouse gas emissions, the technology is expected to reduce seed broadcasting application rates. The laser land levelling, including an orientation on basic tractor operation and laser leveling equipment troubleshooting, will also serve as a training exercise for potential service providers.

24. The project will conduct "learning by doing" training by demonstrating and training in farmer fields in specific locations with three sites in each province. The farmer will be contracted to undertake CSA practices, which for rice will link into SRP procedures or CAMGAP in the case of mango production areas. CAMGAP on mangoes will be demonstrated on one of the three sites. If appropriate to CSA, some of the mechanization demonstration work will be cross-cutting with the on-farmer field training activities of farm mechanization particularly in: (i) minimum tillage; (ii) rice alternate wetting and drying; and (iii) post-harvest technology. Demonstrations in CSA can also be established on farmer fields that relate to soil improvement through crop rotation with such crops as mung beans, sesame, millet, cucurbits and or green manures. The SRP Alliance is planning to pilot SRP in Cambodia and the alliance needs to be encouraged to establish a pilot demonstration in at least in one of the four targeted provinces. Wherever possible, private sector service providers will be invited to undertake training programs, particularly in farm machinery operation, operation and maintenance and equipment and tool fabrication, standards compliance, and accountancy and agribusiness. The expected results of this activity by 2025 will be as follows:

- (i) 16 certified trainers on CSA from the General Directorate of Agriculture Department of Industrial Crops and Extension;
- (ii) 40,000 farmers (at least 16,000 women) trained in CSA with productivity increases of at least 15%;
- (iii) 20,000 farmers (at least 8,000 women) trained and compliant with SRP, which leads to direct paddy marketing links with SRP affiliated millers and traders;

- (iv) 500 farmers (at least 200 women) trained and compliant with CAMGAP in tropical fruit;
- (v) 50 provincial input (agrochemical, fertilizer, etc.) suppliers have received training in CSA and capable to pass on that training to farmers;
- (vi) 150 agricultural cooperative management and board members can fulfil their management and accounting obligations as specified within the law of agricultural cooperatives;
- (vii) 50 cooperatives have successfully entered into a profitable agribusiness venture (this does not include establishing a saving and loan scheme);
- (viii) At least 27 FWUCs or FWUGs and at least 500 FWUC or FWUG members have the capability to operate and manage their irrigation schemes;²⁶
- (ix) The operation of agricultural machinery expanded;
- (x) 4,000 ha of laser land levelling (~1000 ha in each province) demonstrated to improve water use efficiency; and
- (xi) At least 15 training workshops for government staff and farmers' groups held on project management, and agronomic resource efficiency, climate resilience in value chains and agribusiness.

25. *Activity 2.3 Promoting farm mechanization and extension.* The lack of access to reliable farm mechanization and extension services is a critical constraint in target provinces. The project will provide the training facilities at the provincial level by establishing four provincial agricultural development centers (PADCs) and four provincial agricultural engineering workshops so that they are fully operational to improve and create resource and training centers for service provision, agribusinesses and farmer value chain linkages. The project will finance the building of a PADC in Takeo, Tboung Khmum and Kampong Cham provinces and the rehabilitation of the existing extension/agricultural development center in Kampot. Technical assistance will be provided to manage the training facility and undertake a needs assessment to ensure good training unit management and appropriate procurement. This is to improve the formal training facilities for provincial training and capacity building of CSA, Sustainable Rice Platform (SRP) and Cambodia Good Agricultural Practice (CAMGAP) standards, as well as agricultural cooperatives and FWUC accountancy, bookkeeping and business planning, together with the theory of agricultural machinery and equipment repair, operation and maintenance. Training and classroom equipment will also be provided.

26. The project will support the construction of three farm mechanization workshops, including classrooms in Kampot, Kampong Cham and Tboung Khmum and commissioning the new workshop and classroom in Takeo. Technical assistance will be provided for agricultural engineering design and fabrication, repair, operation and maintenance. Equipment and tools for the repair and maintenance of agricultural production and processing equipment will be supplied. The equipment and tools for the manufacture and assembly of agricultural production and processing equipment, together with the supply of design, training and classroom equipment to the provincial workshop units will also be supplied.

27. **Output 3: Enabling environment for climate smart agri-business enhanced.** Under this output, the project will invest in the creation of an enabling policy and regulatory environment for agribusinesses, the identification of opportunities for private sector engagement in climate change mitigation and adaptation, and provision of improved climate information services to allow farmers to plan their cropping season. This output will include three key activities (i) formulating climate friendly agribusiness policies and standards; (ii) promoting green finance and risk sharing

²⁶ Need not be members from the irrigation schemes supported by the project.

mechanisms, and (iii) supporting climate risk management through information and communication technologies (ICT).

28. Activity 3.1: Formulating climate friendly agribusiness policies and standards. In Cambodia, there is a need for agribusinesses to achieve competitive advantage, to realize economies of scale and continuity of supply, and to break into new markets. To facilitate competitiveness and growth among agri-businesses, enabling conditions must be set. For instance, MAFF and the Ministry of Commerce (MOC) have not yet developed a comprehensive policy for agribusiness and sought ADB support. Climate change needs to be mainstreamed into an agribusiness policy at national level with a view to developing a strong and dynamic market-driven private agribusiness sector and a long-term agribusiness strategy with a climate-friendly vision. Any agribusiness policy would provide stability in the sector to encourage private investment (including “green” investment) and should fully integrate climate change concerns, to imprint a climate friendly vision for businesses in the sector. The policy should promote both mitigation and adaptation opportunities and socially appropriate best practices. The project’s support to climate friendly agribusiness policy development will include:

- (i) identification of measures to remove barriers for private sector investment in climate friendly agribusiness;
- (ii) identification of investment strategies for the public sector to enhance climate smart agribusiness growth;
- (iii) promotion of the development of climate-friendly infrastructure so that Cambodia’s agribusinesses have a comparative and competitive advantage with their regional counterparts; and
- (iv) creation of institutional and legal frameworks conducive to supporting and assisting climate friendly agribusiness, particularly with respect to regulations, taxes, business registration, licenses and the multiplicity of government institutions involved in the sector. The project will seek to identify reforms required to ease freedom to do business while promoting adequate social, environmental and climate-related standards, and to improve efficiencies in logistics and administration.

29. In developing specific policy recommendations, the project will support MAFF to lead an inter-ministerial and development partner coordination mechanism, especially with MOC, MRD and MOE among ministries, and International Fund for Agricultural Development (IFAD), FAO, USAID and Australia’s DFAT among development partners. This coordination mechanism is to ensure synergies and avoid overlaps with other initiatives and contribute to policy harmonization across the government. The coordination mechanism will also ensure that various projects do not produce different guidelines or policy tools on the same topics. The project will also provide support to the technical working group on climate change in agriculture, forestry and fisheries (TWG-CCAFF) to promote policies to facilitate the adoption of CSA.

30. The climate smart agribusiness policy work will entail working with MAFF and MOC within the framework of the Industrial Development Policy (IDP) 2015-2025, particularly to conduct studies identifying priority products with processing potential and prepare a comprehensive action plan based on value chains to enable the government to provide concrete support to those sectors within the scope of the IDP.

31. *Climate-conscious agricultural product standards.* Currently, the International Standards Organization (ISO) is developing ISO 14080 towards climate neutrality in different operations and ISO 26000 to consider climate change adaptation. The project will support developing at least 8 climate-conscious standards for agribusiness operations aimed at climate neutrality and effective adaptation. The activities may be broadly divided into two categories: (i) for standards that have

been drafted already, a technical review followed by public consultation is needed to determine impact for the eventual endorsement by the National Standard Council (NSC), in order that the standards can be national standard with the Cambodia Standard mark; and (ii) for the standards that are yet to be drafted, working groups will need to be formed to develop the first draft, followed by technical committees for the review of the drafts, followed by public consultation with the eventual endorsement by the NSC. For climate-conscious standards, most of the work may fall into category 2. For example, standards for climate-resilient post-harvest infrastructure facilities (e.g., storage, milling, processing) will need to be developed to guide the development of future infrastructure.

32. The project will support activities related to certification and compliance that concerns climate change issues and human health and welfare in line with corporate social responsibility (CSR) guidelines. It includes support to good agricultural practices (GAP) for mangoes to develop a CAMGAP standard for fair trade, organic production, tropical fruit, and support to the SRP. All standards are aimed at strengthening environmental protection and, for those compliant, enter in specific value chains demanding such standards. The CSR and SRP standards are expected to go further in ensuring worker health and safety as well as guaranteeing that there is no child or bonded labor, and ensuring workers have a living wage and an equitable share of the profits within the supply chain. The project will support a human resource development program for government staff to build capacity in policy and standards development and elaboration, and link with the work on regulatory impact assessment, already supported by ADB.²⁷ The expected results of the sub-output by 2024 will be as follows:

- (i) CSA policy drafted and reviewed by MOC and MAFF and jointly endorsed by both ministries;
- (ii) Guidance manuals for climate neutrality and adaptation standards for agribusiness operations developed;
- (iii) Climate-friendly SRP becomes more widely utilized with eight of the largest Cambodia millers/exporters being part of the Alliance;²⁸
- (iv) CAMGAP for tropical fruit standard drafted and becomes a Cambodia Standard with Cambodia standard mark; and
- (v) IDP strategies for climate friendly agribusiness developed.

33. Activity 3.2 Promoting green finance and risk sharing mechanisms. Private sector participation in agribusiness value chains in Cambodia is currently low, due to a difficult business environment in the target provinces. Linkages between producers and processors or traders remain weak. There currently exists a framework for PPPs, supported by ADB. However, the current framework, legal and institutional setting, is not conducive to climate friendly investments. Furthermore, there are no adequate risk-sharing mechanisms between government, local producers and the private sector, meaning that smallholders are often left bearing a disproportionate amount of risk. This limits innovation and the potential upscale of innovative climate friendly technologies. The project will make recommendations to fill these current gaps based on lessons learned and feasibility assessments from previous and ongoing projects, and to introduce innovative mechanisms that can be applied in the project sites.

²⁷ CREST Project – Regulatory Impact Assessment Subproject No. 38421-023.

²⁸ At present, only two Cambodian millers are part of the Alliance, which are not located in the project area of influence. Those that are in the project area of influence: Golden Daun Keo Mill, Cristal Rice Mill and Sek Meas Rice Mill will participate in the SRP scheme.

34. The project will support in (i) creating an enabling environment for PPPs in agribusiness in the four value chains; (ii) the identification of incentives for private sector participation in agribusiness particularly improving the private sector's access to green finance and ways to reduce the risk aversion of commercial banks; and (iii) reducing the financial risks associated impacts climate change on the raw material base.

35. To achieve the PPP objectives, the project will support dialogues between public and private sector stakeholders at the national level through convening an Inter-Ministerial Committee (IMC) and promote the establishment of crop centric PPP forums for each value chain (cassava, maize, and mango) both of which will meet twice a year.²⁹ After each forum is held, the IMC would meet to review the crop forum points raised and to respond to the recommendations. The Project Manager will represent the PMU at each of the committee meetings and crop-centric forums.

36. The project preparation technical assistance (PPTA) consultants identified eight PPP projects within the value chains.³⁰ The project will conduct detailed feasibility studies within the project implementation. Two study tours for selected representatives from the government will be conducted during the fourth year of project implementation to learn best practices and benchmarking of potential Cambodian PPP initiatives.

37. To further encourage climate-friendly private sector engagement and to orient the market towards "greening" the value chains, the project will strengthen the capacity of financial institutions on green finance to devise and channel climate-friendly agribusiness investments. This will build on the Mekong Sustainable Finance Working Group and the Micro-Finance Institutions (MFI) Client Protection Principle to help Cambodian financial institutions develop environmental and climate screening criteria and tools to guide their lending activities. Coordination and lessons sharing will also be pursued with the Association of Banks in Cambodia (ABC), which has recently launched the Cambodian Sustainable Finance Initiative (CSFI), an effort to develop sustainable finance principles and announced plans to work towards integrating environmental and social safeguards and lending standards into their business decisions. CSFI is supported by USAID, Pact, Wildlife Conservation Society (WCS) and Mekong Strategic Partners, in partnership with the National Bank of Cambodia and MOE. CSFI is aimed at developing and strengthening finance sector safeguards and risk management standards related to social and environmental impacts which are potentially created through the private sector.

38. The project will complement CSFI activities by providing training for commercial banks and microfinance institutions in targeted areas on (i) identification, benefits and opportunities of green financing, especially through environmental and climate risk screening criteria; (ii) awareness of green financing principles, operations and requirements; (iii) integration of green finance criteria into credit application and reporting procedures; and (iv) reporting on green finance. This training is expected to reduce the risk aversion of commercial banks, while also strengthening linkages, trust and shared understanding between lenders, borrowers, and input and services providers regarding climate friendly agribusiness investment opportunities.

39. The project will seek to reduce risks associated with impacts of climate change, particularly for smallholder farmers, through creating an enabling environment for climate risk sharing

²⁹ It is not necessary for a rice forum as the Cambodia Rice Federation can fulfill that role.

³⁰ The PPP initiatives identified were mango nursery development and seedling certification, the establishment of a Mango Producers Association, cassava chip storage, value added product development and sales, paddy cleaning, drying and storage, Mechanization workshop and resource center, seed multiplication and storage and the promotion of aromatic rice seed and licensing and establishing tissue culture enterprises.

mechanisms such as crop insurance under the guidance of inter-ministerial committee on crop insurance headed by the Ministry of Economy and Finance (MEF). Because penetration of crop insurance and other risk sharing instruments is extremely low, the project will first provide policy support by examining financial and regulatory constraints specific to target provinces and identify mechanisms to overcome such barriers. The project will build on the experiences of the Climate Resilient Rice Commercialization project which focuses on Battambang, Kampong Thom, and Prey Veng provinces and the work of the Cambodian Center for Study and Development in Agriculture (CEDAC) in five provinces, including Kampot and Takeo. The project will examine opportunities to expand such services to Kampong Cham and Tboung Khmum and consider including cassava and maize to rice as the portfolio of insurable crops.

40. As part of the policy support on green finance and risk sharing mechanisms, the project may explore additional opportunities to enhance financial sector participation in agribusiness investments. The opportunities for establishing an agricultural supply chain adaptation facility, in which a partner financial institution (e.g., Rural Development Bank which is being encouraged to lend to cooperatives) can share some of the contract farmers' credit risk through first-loss guarantee, may be explored.³¹ Feasibility of climate smart lending platform and value chain financing options such as warehouse receipt financing scheme may also be considered.³² The credit facility and guarantee scheme are expected to be available for only those projects that meet specific climate safe screening criteria which will be developed. It can also be made available for commercial banks when lending to SMEs meeting those same criteria. This will serve two purposes, to provide: (i) a commercial incentive for banks to abide by the agreed best practice and climate change screening principles; and (ii) an extra degree of confidence for commercial banks to lend to the underserved SME market, provided the borrowers meet the guaranty eligibility criteria. The technical assistance related to credit guarantee program may involve: (i) finalizing the design of the guarantee scheme with all key stakeholders (Cambodian banks and ADB, MFIs, and RDB) in such a way that the scheme remains simple to operate while offsetting against additional risks; and (ii) designing a guarantee training program for banks/MFIs and RDB to understand guarantee criteria and eligibility, usage, and administration.

41. *Activity 3.3 Supporting climate risk management through Information and Communication Technologies (ICT).* To support the enabling environment for low-carbon climate resilient agricultural value chains, the project will strengthen capacity of local stakeholders to use improved ICT and agro-meteorological services. It will include provision of training to MAFF on the formulation and dissemination of dynamic or updated crop calendars, the formulation and distribution of advisories for slow-onset climate events such as droughts, improved delivery of seasonal climate forecasts, as well as early warnings for extreme rainfall events. The project will support the acquisition and collection of climate and crop data to support crop modeling, as well as the design of tools and guidelines for managing climate risks at farm and landscape levels.

42. An ICT platform for CSA will be established in Kampong Cham province using innovative technologies such as cloud computing, and internet-of-things solutions on a pilot basis. The platform will facilitate adoption of more energy-efficient and water use efficient measures, climate friendly agriculture practices and farm credit services. The platform will have three modules:

- Module 1: Information advisory systems such as market information systems and weather information services;
- Module 2: Digital technologies for CSA practices; and
- Module 3: Information systems to monitor and manage climate risk management activities.

³¹ For more details: <http://climatefinancelab.org/idea/agricultural-supply-chain-adaptation-facility/>

³² For more details: <http://climatefinancelab.org/idea/climate-smart-finance-smallholders/>

43. Module 1 will use the existing market information system and improve the organization of contents, modes of dissemination, enable price simulation and forecasting capabilities. Targeted information and additional data points will be introduced to add value to Kampong Cham farmers, traders, rice mills, and animal feed manufacturers. Agrometeorological capabilities will be introduced to deliver weather forecast and early warning messages to the farmers in the province. Module 2 will enable selected farms with Internet of Things (IoT) based capabilities that will collect information related to soil chemistry, and agriculture inputs. The data collected will be used to provide advisory information to farmers to improve farm productivity. Module 3 will introduce systemic platforms to capture climate risk management services such as emergency aid disbursement activities and integrate digital payment methods.

44. This will be a pilot initiative of e-agriculture components such as agro-meteorological algorithms, upgrades to the existing market information system and capacity development that are conceptually applicable to all provinces, as well as specific components, such as CSA practices and technologies, farm credit information systems and procedures and emergency fund disbursement systems. These will enable better planning of agribusiness activities, which in turn will lead to adoption of better farming practices that are climate friendly. Developing data collection and strengthening activities will support the sustainability of climate friendly actions of the project.

B. Subproject Feasibility, Design and Approval Process

45. For all subprojects, the national feasibility study and detailed engineering design consultants (package: CS5) will prepare the feasibility study for each subproject and will include a survey, technical specification criteria, social and gender safeguards, land compensation and resettlement, environment and the economic feasibility. The studies will be reviewed by the project implementation consulting firm (PIC, CS1) and if satisfactory will be passed onto the IA for further scrutiny, and through PMU submit to ADB for no-objection (for each of the first type of intervention), succeeding feasibility studies will be submitted to ADB and PSC for information).

46. If unsatisfactory, the feasibility study will be returned to the “national feasibility study and detailed engineering design consultants” for revision. For subprojects included in the longlist from PPTA, upon receipt of ADB’s no-objection will be returned to PMU for preparation of detailed engineering design. All approved subprojects will be submitted to the project steering committee (PSC) for information.

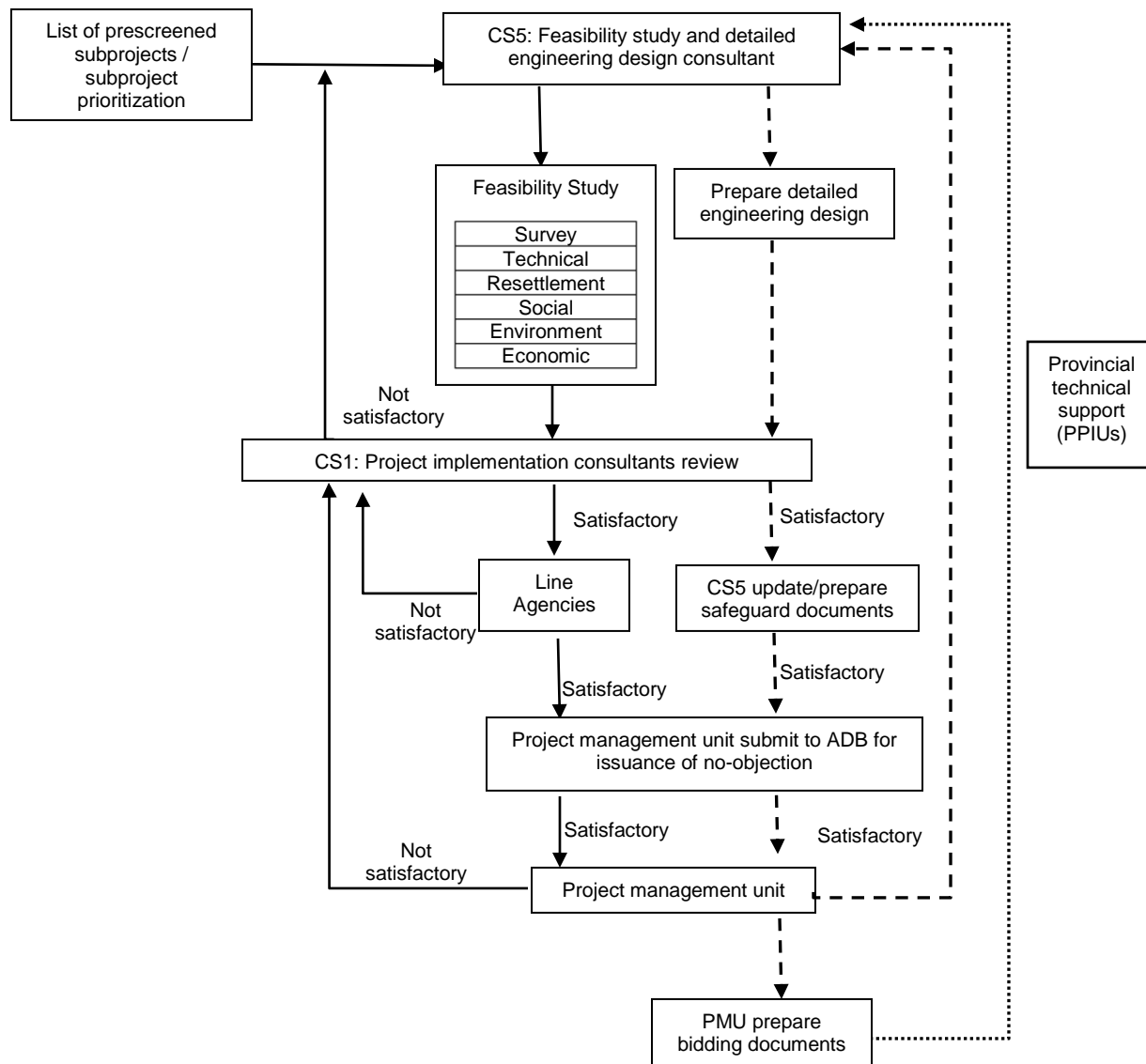
47. The review must confirm the eligibility of each subprojects based on the eligibility criteria defined in PAM. However, if there is justification for revision then the PMU can update the criteria with endorsement from PSC and ADB.

48. In case a candidate subproject does not meet the above criteria, it will be replaced by the next priority candidate subproject from that respective province under the list of eligible subprojects identified during PPTA and refined during project implementation based on provincial priorities and recommendations from provincial technical specialists. If not listed subprojects are considered, they will be examined and screened by PMU supported by PIC and submitted to PSC for endorsement and to ADB for approval.

49. Once the feasibility studies have been approved, the CS5 consultants will prepare the detailed engineering design. Detailed engineering design of subprojects will take due account of projected climate change impacts and incorporate design features that enhance resilience of the

interventions, as appropriate. The provincial line agencies will assist CS5 in carrying out the necessary surveys and the relevant line agencies as well as the PIC will provide technical support to CS5 consultants as required. Provincial technical specialists of PPIUs will also assist in providing local knowledge and facilitate the feasibility. The detailed engineering designs will be reviewed by the relevant line agencies to ensure compliance with standards and regulations of the government. Once approved by the relevant technical line agencies, resettlement action will be initiated if required. The PIC will review the detailed engineering design to ensure compliance with appropriate standards and resettlement as well as the environmental management plan (EMP). The PMU will review and approve the detailed engineering design and then initiate the bidding process.

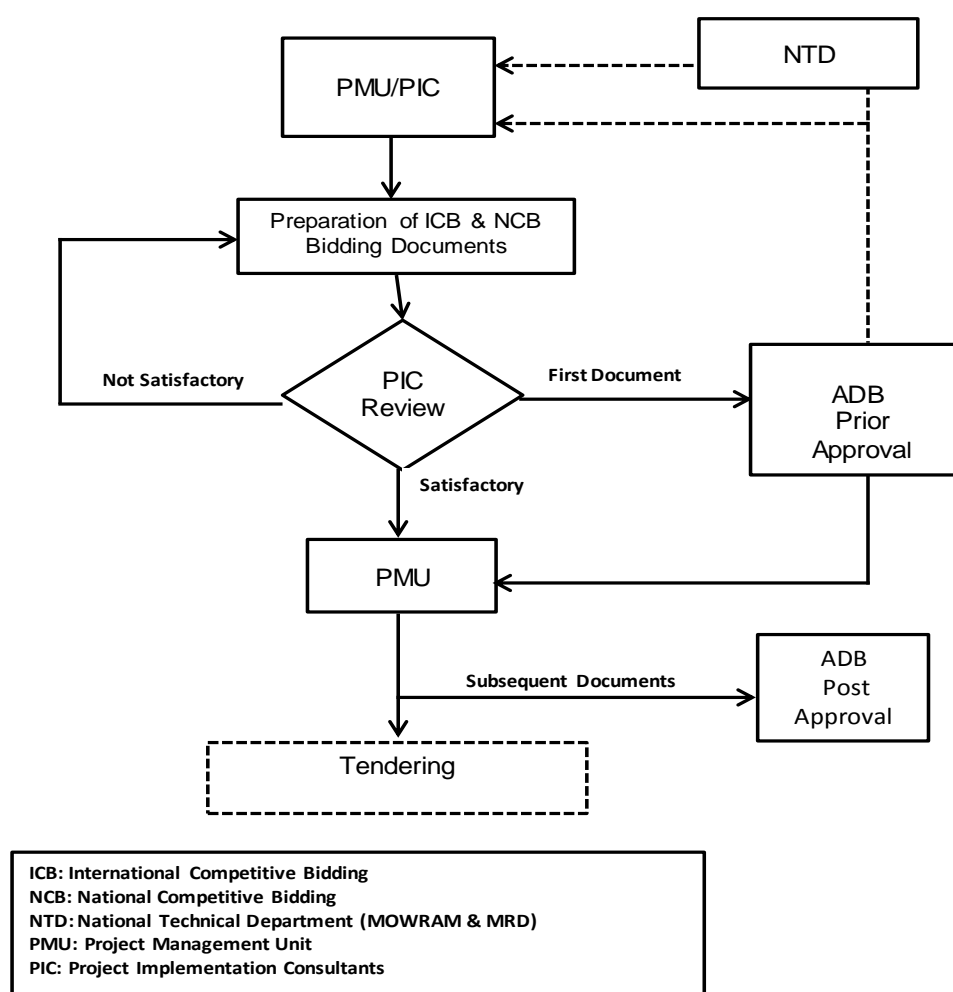
Figure 1: Subproject feasibility study and detailed engineering design



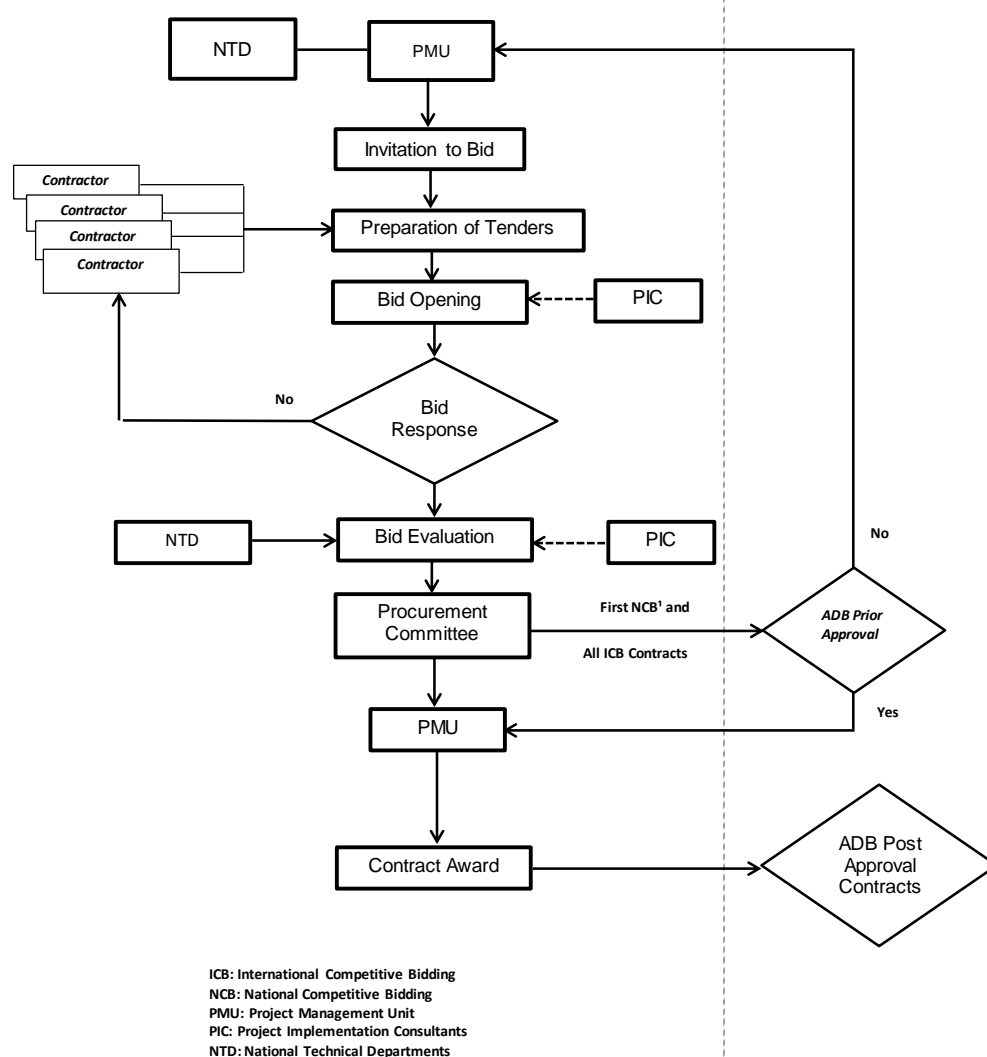
—————> Feasibility studies flow
 - - - - -> Detailed engineering design flow
> Provincial project implementation units will provide provincial technical support all throughout the process.
 For documents found to be not satisfactory it follows the same process.

50. Once the detailed engineering designs are approved, the concerned national technical department (NTD) of MOWRAM, MRD and MAFF with assistance from the PMU and the PIC will prepare bid documents following ICB or NCB procedures depending on the estimated value of the contracts. For irrigation subprojects, MOWRAM will prepare the bid documents; for AC drying and storage units GDA MAFF will prepare the bid documents, as well as for on-farm irrigation systems and MRD for AC market connectivity. The bid documents will be prepared based on ADB standard format documents. The draft English language version of the procurement documents for the first ICB and NCB contracts will be submitted for ADB review and prior approval regardless of the estimated contract amount. ADB-approved procurement documents will be used as a model for all subsequent ICB and NCB procurement. The PIC will review the bidding documents before they are submitted to ADB for approval (Figure 2).

Figure 2: Bidding document preparation



51. Procurement of civil works contracts for the subprojects will be carried out by PMU in conjunction with NTD of MRD and MOWRAM, where appropriate. A bid evaluation committee will be formed, represented by PPIUs, PDAFF and PDWRAM. PIC will assist the committee in the opening and evaluation of tenders. Recommendations which bid to accept will be passed on to PMU for contract award (Figure 3).

Figure 3: Works contract procurement

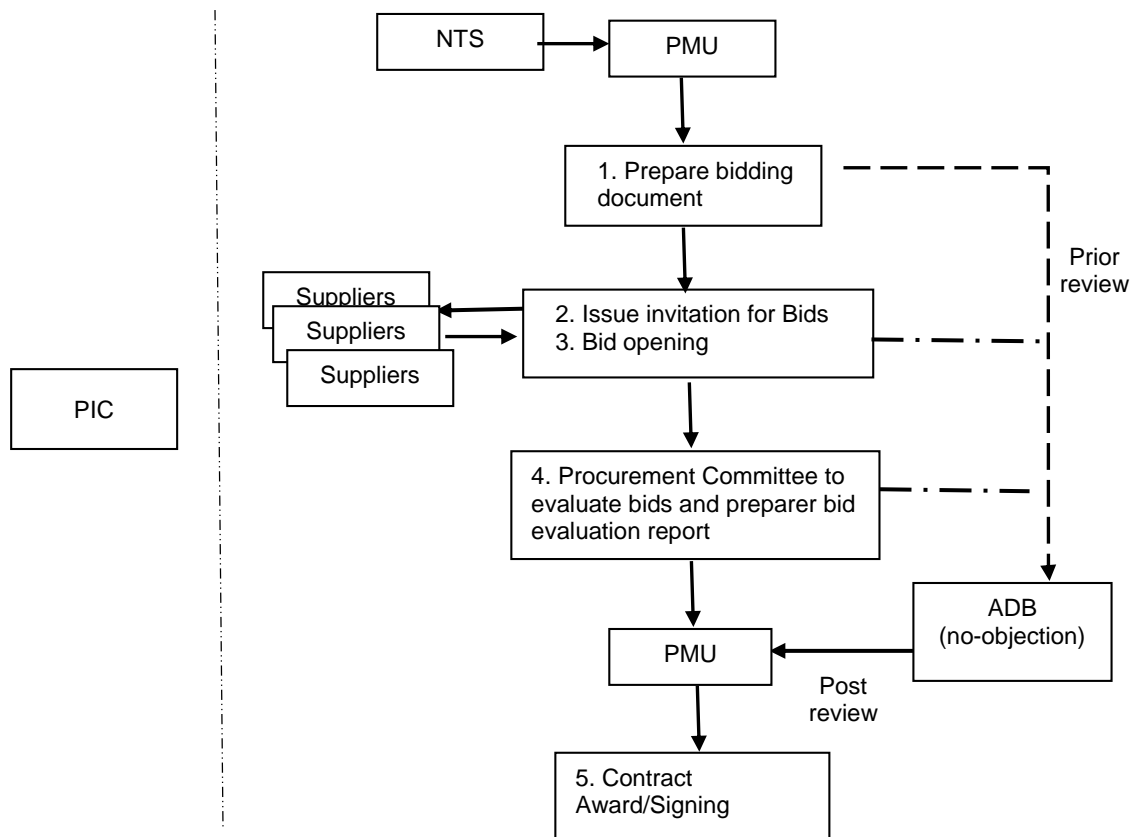
¹ The first NCB contract of each different type of infrastructure for each province will sent to ADB for prior review.

52. Within the four provinces, several subprojects have been identified by the design consultants, primarily related to (i) irrigation and water management systems; (ii) AC drying and storage units; (iii) surface water catchment ponds; and (iv) pilot drip irrigation systems. These subprojects have been pre-screened to ensure consistency with eligibility criteria including ADB and the government's social and environmental safeguards. The eligibility criteria were described in the first section of this annex.

C. Procurement of Goods Approval Process

53. For prior review, the bidding documents for goods need to be reviewed by ADB before issuance to the suppliers; and for post review, the bid evaluation reports should be submitted for post review as soon as they are completed and issued but no later than 1 month after their issuance.

Flow Chart for Procurement of Goods



D. Infrastructure Operation and Maintenance Arrangements

54. Infrastructure O&M is critical to ensuring its continued effectiveness and productivity, and improper or inadequate O&M arrangements can undermine the long-term utility of the investments and lead to more costly rehabilitation efforts. The root causes of underperformance of O&M in Cambodia are insufficient funding, inadequate capacity, and inappropriate governance structures. The government's manual on Standard Operating Procedures (SOP) requires that the EA/IA must determine the impact of the project on its annual resources/budgets for O&M and how these additional future costs will be covered by the Royal Government of Cambodia or EA to ensure sustainability. SOP, para 50 also recommends that a comprehensive O&M plan must be developed at an early stage of project development. MEF established an O&M budget of about \$15 million per year for all types of infrastructure. The amount is limited, but the ministry plans to increase O&M budget gradually. The project aims to address the O&M barriers related to governance, capacity, funding and technology as follows:

55. **Institutional arrangements.** For each water management infrastructure sub-project, the PDWRAM will encourage FWUGs or FWUCs to establish O&M committees and prepare O&M plans. Likewise, each agricultural cooperative will be required to prepare a realistic and technically viable O&M plan for infrastructure related to renewable energy and post-harvest operations. The O&M plans will clearly define the roles and responsibilities of the different stakeholders, include a schedule of routine maintenance activities, initial user tariffs (wherever applicable), and

collection mechanisms for at least the first few years after construction, as well as estimated O&M costs for the lifespan of the infrastructure. O&M plans will be updated and finalized on completion of the subproject and agreed upon. Formal links with PDAFF, PDWRAM, PDRD at provincial level and MAFF, MOWRAM and MRD will be established, with their roles and contributions to O&M included in the plans. The number of completed subprojects that have O&M plans in place, and the number of subprojects that are functional and used by communities a year after completion will also be monitored. The PMU staff will visit a sample of the subprojects after completion to evaluate O&M. The project will also have a mechanism for effective complaints handling or grievance redress mechanism on O&M.

56. Capacity building. As part of output 2, the project will have a strong focus on O&M learning. O&M training will be provided at regular intervals to FWUGs, FWUCs, agricultural cooperative members, biodigester beneficiaries and other stakeholders, including provincial government authorities, and, where appropriate, small-scale contractors or private companies involved in O&M. The project will raise awareness of the need for O&M through several channels including videos and distribute simple pictorial manuals or user-friendly guides to help communities in carrying out O&M activities. Capacity building will also include communication materials and information campaigns to encourage appropriate behavior in support of O&M, such as proper use of infrastructure, fee payment, and so forth. Some efforts will also be devoted to enhancing organizational and managerial capacity of FWUC/FWUGs on O&M. The project will support a community networking strategy -a peer-to-peer learning initiative- that supports the sharing and dissemination of best practices and lessons learned on O&M and will facilitate integration, business relations formation, and cross-fertilization throughout. Finally, the project budget includes post-construction training and technical support to O&M. The project design and monitoring framework (DMF) includes that at least 27 FWUCs will develop capacity to operate and maintain their irrigation schemes.

57. Financing. The project budget covers short-term financing needs for routine O&M. To the extent possible, O&M financing of irrigation subprojects would be partly covered by user fees from FWUGs or FWUCs. In addition, MOWRAM will seek support from MEF's O&M budget (currently about \$15 million annually). The Department of Agricultural Cooperative Promotion (DACP) of MAFF will also allocate limited O&M budget for cooperatives to be supported under the project. Farmers' willingness to contribute labor or cash for O&M of infrastructure at agricultural cooperatives will also be a criterion for support. The project will establish appropriate incentives for O&M wherever feasible, by exploring public-private partnerships (PPPs) that can play in commercializing O&M efforts. Financial support for each major subproject will be made conditional on the set up and operationalization of relevant O&M arrangements. The subprojects that provide information on O&M costs and responsibilities will be prioritized for support. The information may include: O&M costs to be financed (e.g., operations and minor repairs versus major repairs or capital costs), ways to finance O&M costs after subproject completion (e.g., water user fees, post-harvest infrastructure usage fee), and responsibility to pay for O&M (FWUCs, cooperative members and/or local government authorities).

58. Technical issues. This project aims to rehabilitate infrastructure to a climate resilient condition through good design, proper materials, and appropriate supervision. It is expected that such infrastructure will have lower long-term O&M costs. In this process, the best practices learned from other ADB projects regarding design quality and construction will be followed. Efforts will be made to select appropriate design and technology, use local materials of required quality, and provide supervision to ensure construction is in accordance with the specifications. Such efforts will help optimize the trade-offs between the lifecycle costs (investment costs and O&M requirements) and the scale of benefits to the community. For biodigesters, only those

biodigesters meeting national biodigester standards will be commissioned. The project implementation consultants (PIC, package CS1) will assess alternative technical solutions and inform communities of associated lifecycle costs, including future O&M costs. The following table summarizes planned O&M for each type of infrastructure under output 1.

Infrastructure type	Institutional arrangements	Capacity building	Financing	Technical issues
1.1 Rehabilitating water management infrastructure to climate resilient condition	FWUGs and FWUCs, with support from PDWRAM, will prepare O&M plans for each irrigation sub-project.	The project will train FWUGs and FWUCs on O&M through workshops, awareness raising and multimedia.	MOWRAM will seek MEF budget on O&M. The project will encourage collection of water user fee from FWUCs.	Climate resilient design, proper construction materials, and appropriate supervision will be ensured.
1.2 Upgrading agricultural cooperative value chain infrastructure	Each agricultural cooperative, in cooperation with DACP, will develop an O&M plan for post-harvest infrastructure.	The project will train cooperative members on O&M for post-harvest infrastructure.	DACP will seek MEF budget on O&M for a few cooperatives. Farmers will be encouraged to contribute labor or cash to O&M of post-harvest infrastructure.	Good design, proper materials, and appropriate supervision will be ensured.
1.3 Improving connectivity to cooperatives and markets through climate resilient farm road networks	Agricultural cooperatives, in cooperation with PDRD, will develop O&M plan for rural roads.	The project will train cooperative members on O&M of farm roads.	PDRD will encourage farmers to contribute labor to maintain farm roads; MRD will seek MEF budget on O&M to cover critical roads.	Climate resilient design, proper construction materials, and appropriate supervision will be ensured.
1.4 Strengthening infrastructure for agricultural quality and safety testing	National Agricultural Laboratory (NAL) will be responsible for O&M of all lab facilities.	The project will train NAL staff on O&M of laboratory facilities.	NAL will allocate necessary O&M budget.	Internationally certified laboratory equipment will be procured.
1.5 Promoting renewable energy for value chain improvement	National Biodigester Program, in cooperation with the General Directorate of Animal Health and Production, will provide advice on O&M to project beneficiaries.	The project will train farmers on O&M of biodigesters and cooperative members on O&M for solar panels.	Farmer beneficiaries will be encouraged to cover the costs of O&M for biodigesters. The cooperatives will allocate resources for O&M of solar panels.	Quality of biodigesters and solar systems will be ensured through procurement from certified companies.

TERMS OF REFERENCES FOR CONSULTING SERVICES

A. Package CS1: Project Implementation Consultants (PIC)

1. **Objectives of the assignment.** To provide management and technical assistance to the executing and implementing agencies in the implementation of the project, strengthen technical and management capacities of the participating government agencies and farmers' water user cooperatives and ensure compliance with the financing agreement (e.g. safeguard) and government policies.

2. **Scope of services, tasks.** In close coordination with the coordinating project director and project manager, deputy team leader, procurement officer and financial management specialist based in the project management unit (PMU), PIC as counterpart of the government staff will perform following but not limited to:

- (i) Support, strengthen, coordinate and guide PMU, the provincial project implementation units (PPIUs), implementing agencies and contractors in the design and operation of the infrastructure related to (a) water management and irrigation, (b) cooperative stores, (c) the provincial agriculture development centers, and (d) mechanization workshops.
- (ii) Detailed planning of yearly activities in all aspects of the agreed and foreseen implementation schedules;
- (iii) Review feasibility studies and detailed engineering designs for subprojects prepared by the feasibility study and detailed engineering design consulting team;
- (iv) Supervise construction of civil works in conjunction with the civil engineers assigned in the PMU under MOWRAM and MRD;
- (v) Provide necessary capacity building training;
- (vi) Assist farmers water user groups and or cooperatives in establishing operation & maintenance systems;
- (vii) Assist PMU, PPIU and implementing agencies in the procurement of works, goods and services including contract management;
- (viii) Carry out environmental and social due diligence of each subproject;
- (ix) Assist in the preparation of safeguard documents in compliance with the land acquisition and resettlement framework (LARF), environmental assessment and review framework (EARF), ethnic minority development framework (EMDF) and gender action plan (GAP);
- (x) Prepare quarterly progress reports; annual progress reports, project performance monitoring system (PPMS), safeguard monitoring reports and gender action plan monitoring reports;
- (xi) Plan and develop the safeguards monitoring and evaluation systems; and
- (xii) Any other activities for delivering the envisaged outputs of the project and achieving desired outcome.

3. Team composition & qualification requirements for the key expert

- a. **International Project Management and Rural Infrastructure Specialist/Team Leader** (18 person-months, intermittently)

4. **Minimum qualifications:** The expert will have at least a master's degree in irrigation and civil engineering or related field. 15 years' experience working in implementation and

management for agriculture and natural resources sector project. At least three ADB financed projects as team leader. It will be an advantage if the candidate has (i) excellent communication (written and oral) skills and strong inter-personal skills; (ii) experience working in Cambodia or other countries in Southeast Asia, and (iii) knowledge in value chain-based projects for agribusiness development in Southeast Asia region.

5. **Tasks and deliverables.** The specialist will:

- (i) provide overall responsibility for technical support during implementation, including preparation and implementation of work plans;
- (ii) maintain good coordination among ADB, PMU, the Ministry of Agriculture, Forestry and Fisheries (MAFF), the Ministry of Water Resources and Meteorology (MOWRAM), the Ministry of Rural Development (MRD) and other stakeholders and assure links with key institutions e.g. the Ministry of Economy and Finance (MEF);
- (iii) review feasibility studies and detailed engineering designs for subprojects prepared by the feasibility and detailed design consultants;
- (iv) supervise construction of civil works in conjunction with the civil engineers assigned in the PMU under MOWRAM and MRD;
- (v) assist the monitoring and evaluation staff in the PMU in establishing an appropriate management and monitoring system;
- (vi) work closely with other consultants to provide inputs, identify gaps, and provide timely recommendations e.g. in financial management, capacity building training, procurement;
- (vii) monitor progress against project implementation schedule and ensure good quality of reports are submitted; and
- (viii) actively participate in project supervision and field visits to project sites as required.

b. International Procurement Specialist (6 person-month, intermittently)

6. **Minimum qualifications:** The expert will have a master's degree in business administration, engineering or other related fields with preferably 10 years' experience in procurement of works and goods, preparation of tender and contract documents, evaluation of bids, and contracts managements of projects, and recruitment of consultants including at least one ADB financed project. The specialist should have demonstrated experience with developing and managing FIDIC contracts for large works.

7. **Tasks and deliverables.** Include assisting PMU in:

- (i) review and update existing procurement manuals for the project;
- (ii) preparing bidding documents;
- (iii) preparing request for proposal;
- (iv) evaluating of bids / proposal, prepare bid evaluation reports / submission for recruitment;
- (v) negotiations and finalizing contract agreements for works, goods and services;
- (vi) developing, and organizing contract management capacity building and training covering FIDIC, and ADB's procurement guidelines and procedures for the project implementation staff;
- (vii) preparing progress reports and quality control and inspection systems to be followed during execution of civil work contracts; and
- (viii) resolving contractual issues.

c. International Social Development and Gender Specialist (6 person-month, intermittently)

8. **Minimum qualifications:** The expert will have at least a master's degree in gender, social sciences, development studies or related discipline. At least 10 years of experience in gender-related work in the context of agriculture and rural development and familiar with the policies and practices in Cambodia for donor-funded projects (e.g. World Bank, ADB). It is an advantage if the candidate has excellent communication (written and oral) skills and strong inter-personal skills.

9. **Tasks and deliverables.** The specialist will report to the project manager of the PMU. The PMU will support the specialist in organizing field work related to (i) the preparation of required social analysis appendices of subproject feasibility studies; (ii) required social benefit monitoring activities; and (iii) and social development and gender awareness capacity building workshops with stakeholders in the target areas. H/She will:

- (i) Prepare reports on subproject poverty and social assessments, stakeholder communication strategy, and consultation and participation plans for local community engagement to ensure beneficiaries leverage full impact of the project's activities.
- (ii) Provide technical leadership related to the future proposed subprojects from the social development and gender perspectives, and based on the gender analysis of the four agricultural value chains; commencing with a review and reconfirmation of the subprojects developed during project preparation in close association with the PMU and provincial implementing agencies (IAs) and MAFF Gender Focal Points (i.e. the Gender and Children's Project Support Unit [GCSPU]); develop detailed baseline and targets for overall GAP and poverty reduction indicators and for each sub-project;
- (iii) Review the summary of poverty reduction and social strategy (SPRSS) and the gender action plan (GAP) available as linked documents and their application in the three representative subprojects;
- (iv) Working with PMU, GCSPU, and provincial implementing agencies and the project affected communities in providing advice on implementing GAP, regularly monitor and report (at least semi-annually to ADB) using the template in Annex 4. Refer to the ADB gender tip sheets for GAP implementation, monitoring and reporting.
- (v) Coordinate with MAFF GCSPU to ensure alignment with and support the operationalization of MAFF Gender Policy and Strategy;
- (vi) Implement specific activities included in GAP, such as building capacity of PMU staff and other key stakeholders including GCPSU and gender focal points in gender analysis and gender mainstreaming, and particularly gender analysis of value chains and in the agricultural sector (GAP action 2.3.3); providing advice to PMU on key recommendations from the gender analysis of the targeted value chains for inclusion in MAFF agri-business policy (GAP action 2.3.2);
- (vii) Work closely with the monitoring and evaluation specialist to ensure that the gender indicators and targets included in the design and monitoring framework (DMF) and GAP, as well as indicators to measure ID Poor status changes over time are included in PPMS for the project and build capacity to collect and document the relevant quantitative and qualitative data;
- (viii) Design and assist the IAs in the implementation of appropriate additional socioeconomic and other relevant surveys in each target area, with data disaggregated by sex, ethnicity and income; to be used to establish the baseline, targets and measure change over time;

- (ix) Work closely with the IAs in all subproject areas and support them in implementing the activity plans that constitute part of the SPRSS/GAP. This will include, but not be limited to refining training and capacity building activities for the IAs, regarding support for implementation of the project loan and to strengthening national systems for gender mainstreaming through the MAFF GCSPU;
- (x) Design and assist the IAs in the implementation of information campaigns and community mobilization, and further, programs and projects to develop livelihoods, social development and vocational needs with an emphasis on poor and vulnerable households such as ID Poor and female-headed households;
- (xi) Coordinate with the project safeguard specialists regarding the livelihood and social development aspects, and advising the IAs on a training needs assessment of impacted households, including disaggregation of livelihoods by gender and ethnicity if relevant;
- (xii) Ensure that social development and gender issues are accurately covered within all phases of the project; and assess and carefully track ID poor and women's livelihood needs;
- (xiii) Assist the IAs with provision of technical assistance and coordination of demand-driven awareness building and training and guidelines to support vulnerable households and groups;
- (xiv) Work closely with the National Social and Gender Specialist and the GCSPU, Women's Farmers Network (WFN) and gender focal points in project activities and particularly GAP implementation, and prepare and assist in delivering training courses relevant to project implementation, including gender and inclusion (poor, landless, etc.) related issues for all the project implementation agencies and other stakeholders as appropriate;
- (xv) Facilitate knowledge sharing on social development and gender related issues, including from the Climate-Friendly Agribusiness Value Chains Sector projects in Laos and Myanmar, through partner forums, web pages and reports, lessons learned/ best practice from South-East Asia and elsewhere if relevant;
- (xvi) The expert will liaise on a regular basis with the gender specialist at the ADB's Cambodia Resident Mission (CARM) office; and
- (xvii) Guide the National Social Development and Gender Specialist in the preparation of reports and documents following the government and ADB rules and guidelines which will include:
 - social and gender analysis appendices of feasibility studies for subproject preparation;
 - any other social development study reports as required and requested by PMU.

d. International Social Safeguards Specialist (8 person-months, intermittently)

10. **Minimum qualifications:** The candidate must have a relevant tertiary degree in social science and have at least 10 years' experience in resettlement, land acquisition and compensation arrangements and includes some previous experience in ethnic minority development in Cambodia on internationally financed projects, providing a general level of knowledge of rural and community development.

11. **Tasks and deliverables.** S/he will lead and provide guidance in conducting and reporting subproject social safeguard feasibility studies and ensure subproject feasibility study procedures and approval processes are being applied in accordance with the LARF. In addition, s/he will:

- (i) Provide guidance in screening subprojects, conducting feasibility studies, preparing due diligence reports (DDRs) land acquisition and resettlement plans (LARP) and indigenous peoples/ethnic minority development plans (EMDP) according to ADB SPS (2009), LARF and EMDF established for the project;
- (ii) Provide safeguard concept and monitoring training to executing and implementation agencies staff and provide inputs to the project performance monitoring system and other monitoring and evaluation reports on social safeguard indicators;
- (iii) Work closely with the project engineers, social development and gender specialists and the staff of implementing agencies at the national, provincial and district level;
- (iv) In consultation with the engineer, work in close cooperation with General Department of Resettlement (GDR) in preparing LARPs for the subprojects with reference to the final detailed engineering design, and where relevant, and in strict compliance with the provisions of the approved LARF, obtain witnessed donation forms for well substantiated cases of voluntary land donations;
- (v) Assist and direct community consultations as per LARF to identify land acquisition needs for subprojects identified during implementation;
- (vi) Prepare DD Rs or LARP where required, in accordance with the approved LARF and ADB's SPS (2009);
- (vii) Ensure land acquisition agreements are duly signed by the husband and wife and witnessed by village and commune authorities;
- (viii) Review all subprojects to ensure that no land has been acquired through coercion, compensation paid, and that land purchased or acquired by cooperatives was done so under free private commercial transparent transactions;
- (ix) Identify impacts on ethnic minority households and communities and where identified, prepare an EMDP as recommended under the EMDF and in accordance with ADB's SPS (2009) and establish monitoring procedures;
- (x) Prepare training guidelines for preparation of LARP, and EMDP in accordance with Cambodian Laws and Regulations, ADB's SPS, LARF and EMDF. Training must focus on the use of the involuntary and voluntary screens and procedures for establishing the bona fides of voluntary donation, guidelines for land acquisition for subprojects and reporting needs;
- (xi) Provide inputs to the monitoring and reporting systems and provide information required for third party audit of land acquisition and voluntary donation cases; and
- (xii) Carry out other tasks assigned by the Team Leader.

e. International Environment and Climate Change Specialist (8 person-months, intermittently)

12. **Minimum qualifications:** The candidate must have (i) a master's degree or higher in environmental management, agriculture, or natural resource management, (ii) at least 10 years of experience in climate change capacity building, environmental management, monitoring, and/or impact assessment. (iii) familiarity with ADB's environmental safeguard requirements and national environmental management procedures; and (iv) ability to communicate and work effectively with local communities, contractors, and government agencies (v) ability to analyze data and prepare technical reports; (vi) willingness and health to regularly visit the subproject sites; and (vii) with good communication skills (writing and spoken) in English. In addition, the

consultant will have experience in assisting government institutions in developing and implementing communications strategies and must have strong skills in communication, networking, and workshop facilitation to work effectively with all players at implementation level (government, development partners, private sectors, communities and other stakeholders).

13. **Tasks and deliverables.** Working closely with PMU, the PMU safeguards officer, the international and national environmental safeguards specialist under CS5: Feasibility Study and Detailed Engineering Design consultant team, and other relevant personnel and agencies. The specialist, supported by the national environment and climate change specialist under this package, will:

- (i) Assist in all aspects of the implementation of the project's EARF and subproject initial environment examinations (IEEs);
- (ii) Ensure that the steps of the EARF covering environmental screening and impact assessment are followed by PMU, PPIUs and the CS5: Feasibility Study and Detailed Engineering Design consultants;
- (iii) Deliver training in (a) EARF procedures for screening, and assessing environmental impact (IEEs); and (b) record-keeping and reporting;
- (iv) Ensure understanding and compliance with the Climate Risk Assessment and Management for the whole project including construction and operational (post construction) periods;
- (v) Assist PMU to establish and publicize the grievance redress mechanism (GRM) for sub-projects, ensuring that the GRM publicity is appropriate to the scale and complexity of the subproject and includes as a minimum, the disclosure of all contact persons for lodging complaints;
- (vi) Assist PMU to prepare quarterly project monitoring progress reports for submission to ADB;
- (vii) Map out capacity needs of policymakers and other stakeholders in terms of (a) climate data needs; (b) vulnerability and impact assessments; (c) coordination; (d) subnational and gender mainstreaming of climate resilience at policy and operation levels; (e) knowledge management; and (f) appropriate monitoring and evaluation (M&E);
- (viii) identify priority activities for strengthening the capacity of policymakers and relevant stakeholders;
- (ix) advise on knowledge management on climate change adaptation and disaster risk reduction, including unearthing existing and indigenous knowledge and putting together in usable form; and
- (x) prepare training materials, guidelines and sector manuals and conduct training programs and workshops for integrating (a) adaptation into subnational planning and development; (b) gender considerations into adaptation investments; and (c) adaptation indicators into national, sectoral and project M&E systems.

f. International Provincial Agricultural Development Centers (PADC) Operations and Management Specialist (4 person-months, intermittently)

14. **Minimum qualifications:** The candidate must have a degree in civil engineering with postgraduate qualifications in the design and oversight of contracts for offices or training establishments. At least 7 years of professional experience in the operation and maintenance of extension and training centers and be familiar with climate resilient infrastructure and the use of renewable energy in building design. Have good managerial, analytical and interpersonal skills. It is an advantage to have good communication skills (writing and spoken) in English.

15. **Tasks and deliverables.** The candidate will assist the Team Leader, the Deputy Team Leader, the PMU, and the PPIUs in contracts management, construction supervision of the (PADC), development of the operation and maintenance systems, and will:

- (i) Provide necessary technical and management support to the executing agencies and IAs for effective project implementation relating to PADCs;
- (ii) Assist in the development of a detailed work and management plan for PADC infrastructure development in consultation with the implementation agencies, this includes establishing an appropriate management and monitoring system;
- (iii) Review the designs prepared by the PPTA and make recommendations for revision and updating the bill of quantities, if necessary;
- (iv) Assess the plan for the construction of PADCs and evaluate the requests from the four provincial departments of agriculture, forestry and fisheries (PDAFF) for any changes of design that may be required. Make field trips to verify the appropriateness of any design changes requested and report back to the Team Leader, Deputy Team Leader and PMU;
- (v) For each PADC, ensure renewable energy systems are optimal and make recommendations as necessary;
- (vi) Work with the National Training and Capacity Building Coordinator to incorporate design and operation parameters into the training program for all beneficiaries;
- (vii) Supervise and liaise with consultants and contractors contracted to conduct the infrastructure work and offer guidance to them when needed;
- (viii) Provide inputs to PMU on the preparation of bidding documents, evaluation of bids, contract negotiation and contract administration. Procurement will be in accordance with the financing agreement;
- (ix) Monitor the on-site construction to ensure the work is compliant with the quality required and it will be handed over on-time, if not report back to PMU highlighting issues identified;
- (x) At handover, submit an operation and maintenance (O&M) plan for the PADC and lay down guidelines and procedures to ensure O&M is complied with; and
- (xi) Contribute to the preparation and submission of the progress reports for submission to PMU and M&E staff, the frequency of reporting will be in accordance to that specified in the project administration manual (PAM).

g. International Mechanization Workshop Operations and Management Specialist (4 person-months, intermittently)

16. **Minimum qualifications:** The candidate must have a degree in civil or mechanical engineering with postgraduate qualifications in the design and oversight of contracts for mechanization workshops. At least 7 years of professional experience in the operation and maintenance of mechanization repair or fabrication workshops. It is an advantage to have good communication skills (writing and spoken) in English.

17. **Task and deliverables.** With knowledge in the use of renewable energy in building design, s/he will:

- (i) Provide necessary technical and management support to the executing agencies for effective project implementation relating to provincial mechanization workshops;
- (ii) Assist in the development of a detailed work and management plan for provincial mechanization workshop infrastructure development in consultation with the

- implementation agencies, this includes establishing an appropriate management and monitoring system;
- (iii) Review the designs prepared by the PPTA and make recommendations for revision and updating the bill of quantities;
 - (iv) Assess the plan for the construction of the provincial mechanization workshops and evaluate the requests from PDAFF for any changes of design that may be required. Make field trips to verify the appropriateness of any design changes requested and report back to the Team Leader, Deputy Team Leader, and PMU;
 - (v) For each mechanization workshop ensure renewable energy systems are optimal and make recommendations as necessary;
 - (vi) For each mechanization, review the procurement list relating to tools and equipment and make revisions where necessary prior to procurement;
 - (vii) Work with the mechanization capacity building and training experts and specialists to incorporate design and operation characteristics into the training program for all beneficiaries;
 - (viii) Supervise and liaise with the consultants and contractors that are contracted to conduct the infrastructure work and offer guidance to them when needed;
 - (ix) Provide inputs to the PMU on the preparation of bidding documents, evaluation of bids, contract negotiation and contract administration. Procurement will be in accordance with the financing agreement;
 - (x) Monitor the on-site construction to ensure the work is compliant with the quality required and it will be handed over on-time, if not report back to PMU highlighting issues identified;
 - (xi) At handover submit an O&M plan for the provincial mechanization workshops and lay down procedures to ensure O&M is complied with; and
 - (xii) Contribute to the preparation and submission of the progress reports for submission to the PMU and M&E staff, the frequency of reporting will be in accordance to that specified in the PAM.

h. National Project Management and Rural Infrastructure Specialist/Deputy Team Leader (3 individuals for 90 person-months, intermittently)

18. Minimum qualifications: The expert will have a master's degree in water resources / irrigation engineering and preferably 10 years of experience in design, implementation and management of irrigation systems. At least with 5 years' experience of working with international consulting firms in donor funded projects and government and with good communication skills in spoken and written English. S/he will be assigned individually in MAFF, MOWRAM, and MRD

19. Tasks and deliverables. Under the guidance of the Coordinating Project Director, Project Manager and in coordination with the Team Leader, the expert:

- (i) Will assume the team leader's responsibility in the absence of the international team leader from PIC;
- (ii) Provide necessary technical and management support to the executing and implementing agencies for effective project implementation;
- (iii) Develop and prepare annual detailed work plan in consultation with the executing and implementation agencies to be used and submitted annually;
- (iv) Assist in establishing an appropriate management and monitoring system;
- (v) Review the detailed technical specifications of equipment, materials and civil works completed by the feasibility and detailed design consultants;

- (vi) Assist in ensuring coordination between central level agencies, relevant technical support departments and stakeholders at the provincial, district and commune level;
- (vii) Supervise the civil works carried out under the project, in coordination with the PMU and IAs at the provincial, district, and commune level;
- (viii) Together with the PMU Project Manager and the PIC Team Leader review and collate reports from the other consultants, PPIUs, and implementation agencies, highlighting discrepancies, and where applicable implement recommendations;
- (ix) Quality check the progress reports, safeguard monitoring reports, and other compliance reports prior to submission to MAFF and ADB; and
- (x) Other tasks as required by the project.

i. National Procurement Specialist (3 individuals, 54 person-months, intermittently)

20. **Minimum qualifications:** The expert will have a master's degree in business administration, engineering or other related field with preferably 7 years' experience in procurement of works and goods, recruitment of consultants, preparation of tender and contract documents, evaluation of bids, and contract management. Preferably with good communication skills in spoken and written English. Previous experience working with other donor funded institutes (e.g. World Bank) will be an advantage. S/he will be assigned in the national technical departments of MAFF, MOWRAM, and MRD.

21. **Tasks and deliverables.** Under the guidance of the PMU Project Manager, international procurement specialist and in close coordination with the PMU procurement officer:

- (i) Provide guidance to PMU and implementing agencies in preparing bidding documents, evaluation of bids, contract negotiations and in finalizing contract agreements for works, goods and services;
- (ii) Guide the PMU in preparing request for proposal for engaging consulting services and other services, reviewing proposals; negotiating contracts and finalizing contract agreements for services;
- (iii) Recommend and ensure implementation of contract management capacity building training covering FIDIC, and ADB procurement guidelines and procedures for the project implementation staff in the PMU, PPIU, and implementing agencies;
- (iv) Assist in establishing an appropriate procurement monitoring system;
- (v) Review progress reports and issues relating or might affect procurement, and implementation of contracts; and
- (vi) Provide recommendation or advice to resolve contractual issues.

j. National Financial Management Specialist (4 individuals, 152 person-months,)

22. **Minimum qualifications:** The expert will have a master's degree in Finance/Accounting with preferably 7 years of relevant work experience working with international consultants/organizations preferably in donor funded projects and government institutes. S/he will have experience in financial management and accounting of preferably in one of ADB financed project. Preferably with good communication skills in spoken and written English.

23. **Tasks and deliverables.** Under the guidance of the PMU Project Manager and in close coordination with the PMU Financial officer:

- (i) Work closely and ensure effective training of PMU's government appointed finance officer;
- (ii) Develop a financial planning system for project implementation and its subsequent operation. Develop long, medium-term and annual operating plans and schedules as agreed between ADB, MEF and the executing agency (EA) for project implementation and subsequent administrative operation;
- (iii) For accounting oversight: develop and establish a manual and standard procedures for project accounting acceptable to ADB, MEF and the EA;
- (iv) For internal control, funds flow management, financial reporting: develop and make operational a manual and procedures acceptable to ADB, MEF and the EA for project financial management;
- (v) For audit planning: assist in the preparation of (i) the terms of reference for independent external auditor for approval by MEF, EA and ADB,³³ and (ii) advise and assist the EA in the recruitment of internal audits to conduct audit of project accounts and advance account activities;
- (vi) Audit management: advise and assist PMU in facilitating external and internal audits;
- (vii) Support the capacity building of financial and accounting staff by following the terms agreed between ADB, MEF and the EA. Plan and organize training in accounting and financial management (including planning) for PMU and the implementing agencies staff assigned to the project implementation and subsequent operation;
- (viii) Following the establishment of financial and accounting procedures, the specialist will be in charge of all the operations and administrative control; and
- (ix) Assist in the review and preparation of withdrawal applications for submission to MEF and ADB.

k. National Social Development and Gender Specialist (50 person-month, intermittently)

24. Minimum qualifications: The candidate must have at least a degree in social sciences, development studies, gender or a related discipline. 5 years of experience in gender-related work specially in agricultural and rural sector. Familiar working with and in ethnic minorities areas. It is an advantage to have good communication skills (written and spoken) in English and familiarity with ADB or other foreign assisted projects.

25. Tasks and deliverables. The national specialist will prepare reports on subproject poverty and social assessments, stakeholder communication strategy, and consultation and participation plans for local community engagement to ensure beneficiaries leverage full impact of the project's activities. High priority value chain subprojects will be identified based on established criteria (e.g., contribution to food security, energy security, water security, environmental sustainability, positive social impacts, including gender equality and poverty reduction). Identification of subprojects will be accomplished through organizing stakeholder consultations with the aim of setting the longer-term vision and objectives of the value chain, identifying constraints and opportunities that are holding back growth and competitiveness, and jointly agreeing on commercially viable solutions that can address these constraints.

³³ The terms of reference should include assessment of the financial audit environment and audit the financial controls at the provincial level.

26. The national specialist will work together with and supported by the international social development and gender expert will collaborate with the PMU, the GCPSU, and IAs in the implementation of subproject poverty and social analyses, gender strategy and action plans. The national specialist will also support mainstreaming of gender into the project through the application of GAP and by providing gender awareness training and strengthening national systems for gender mainstreaming through the MAFF GCSPU, as well as strengthen capacity of the Women's Farmers Network (WFN) in the four project provinces. S/he will:

- (i) Assist the PMU, IAs and other stakeholders (GCPSU, WFN, gender focal points) to implement and monitor the GAP and report on progress of the GAP implementation in accordance with ADB and RGC gender related policies, guidelines (also reference to the ADB gender tip sheets); support PMU and PPMUs in the preparation of annual work plans and budget for GAP implementation and develop and monitor gender and poverty specific indicators for each subproject;
- (ii) Assist the IAs to design and help manage the implementation of new socio-economic surveys as appropriate and which are relevant to the subprojects in the target areas, including gender, poverty and community development;
- (iii) In close coordination with WFN, consult with project related beneficiaries to ensure women's needs and aspirations are addressed in the subprojects detailed design, implementation and subsequent monitoring. In close coordination with the GCPSU, assist the IAs by acting as a gender focal point and facilitator for poverty and gender mainstreaming in data/information collection, monitoring, sector coordination, technical design issues, communication, training and capacity development and mentoring; that includes capacity-building of PMU staff and other key stakeholders including GCPSU and gender focal points in gender analysis and gender mainstreaming (GAP action 3.1.3), and particularly gender analysis of value chains and in the agricultural sector (GAP action 3.1.1);
- (iv) Liaise with the M&E specialist to ensure that the gender indicators and targets included in the DMF and GAP as well as indicators to measure ID Poor status changes over time are included in the PPMS for the project and build capacity to collect and document the relevant quantitative and qualitative data;
- (v) Support capacity building for the GCPSU and the WFN through their active involvement in project activities and training events;
- (vi) In close coordination with the GCPSU and the WFN, contribute to the preparation and delivery of training courses and stakeholder workshops to inform and raise awareness about project related and other more general social development and gender issues in subproject areas;
- (vii) Collect human stories during project implementation that document how the project contributed towards enhanced gender equality and women's empowerment and greater inclusion in the sector – which can be used in the project completion report to document achievement of gender equality results;
- (viii) Facilitate knowledge sharing on social development and gender related issues, including with the sister CFAVC projects in Laos and Myanmar, through partner forums, web pages and reports and including lessons learned/ best practice from elsewhere in Cambodia;
- (ix) Will liaise on a regular basis with the gender specialist in the ADB Cambodia Resident Mission office; and
- (x) Prepare reports and documents following the Government of Cambodia and ADB rules and guidelines which will include:

- Social and Gender analysis appendices of feasibility studies for subproject preparation;
- Progress reports every six months including details of progress of the Gender Action Plan using the template in Annex 4;
- Any other social development study reports as required and requested by PMU; and
- Provide inputs to the monitoring and reporting systems on details relating to third party audit and voluntary donation cases.

I. National Social Safeguards Specialist (72 person-months, full-time)

27. **Minimum qualifications.** The specialist must have a relevant tertiary degree in social science and have at least 5 years experience in resettlement, land acquisition and includes some previous experience in ethnic minority development in Cambodia on internationally financed projects, providing a general level of knowledge of rural and community development.

28. **Tasks and deliverables.** The National Safeguard Specialist will assist to ensure that any land acquisition is voluntary only through thorough application of the voluntary and involuntary screens, in accordance with ADB's Safeguards Policy Statement (2009) and relevant Cambodian regulations and laws. The specialist will be responsible to the international social safeguards specialist and the PIC team leader but will work closely with the project engineer, social development and gender specialists and the staff of implementing agencies at the national, provincial and district level. The specialist will be hired on a full-time basis. Duties will include the following:

- (i) In consultation with the international social safeguards specialist and the engineer, update the DDR for the Trapaing Run irrigation scheme with reference to the final detailed design and obtain witnessed donation forms;
- (ii) Under the guidance of the International Social Safeguards Specialist, conducts thorough social safeguards due diligences for the subprojects following completion of the detailed engineering design in accordance with the outline provided in the approved RF, submits them to the EA for further concordance with GDR and soliciting ADBs concurrence on them;
- (iii) Assist and undertake community consultations in accordance with the LARF to identify land acquisition needs for subprojects identified during implementation;
- (iv) Ensure detailed engineering design documentation provides details of all land that needs to be acquired;
- (v) Assist the team to prepare DDR, LARP and IPP, where needed;
- (vi) Ensure land acquisition forms or any other related contracts are duly signed by husband and wife and witnessed by village and commune authorities;
- (vii) Review all subprojects to ensure that no land has been acquired through coercion and that land purchased or acquired by cooperatives was done so under free private commercial transparent transactions;
- (viii) Ensure that any negotiated settlement case is reported in the social monitoring reports and communicated to ADB for further follow-up;
- (ix) Ensures that cases of voluntary land donations, if any, are in strict compliance with the procedures, including selection and applicability criteria defined in the LARF;
- (x) Identify impacts on ethnic minority households and communities and where impacts are identified, prepare an IPP as recommended under the EMDF and in accordance with the ADB SPS (2009) Safeguards Requirement 3;

- (xi) Assist the international specialist to prepare and deliver training for preparation of a resettlement plan, and ethnic minority's development plan in accordance with the Cambodian Laws and Regulations, ADB's SPS, the project's LARF and EMDF. Training must focus on conducting surveys, detailed measurement, meaningful consultations, establishing local grievance redress mechanism and use of grievance logs and complaint forms, the use of the involuntary and voluntary screens and procedures for establishing the bona fides of voluntary donation only where applicable, guidelines for land acquisition for subprojects and reporting needs;
- (xii) Provide inputs to the monitoring and reporting systems and provide information required for third party audit of land acquisition and voluntary donation cases; and
- (xiii) Carry out other tasks assigned by the team leader.

m. National Environment and Climate Change Specialist (50 person-months, intermittently)

29. **Minimum qualifications.** The specialist will preferably have (i) an undergraduate degree or higher in environment, climate change, agriculture, rural development or in a related discipline and at least 6 years of experience in implementing climate change adaptation and disaster risk reduction (DRR) projects; (ii) at least 10 years of experience in environmental management, monitoring, and/or impact assessment; (iii) familiarity with ADB safeguard requirements and national environmental management procedures; (iv) ability to communicate and work effectively with local communities, contractors, and government agencies; (v) ability to analyze data and prepare technical reports; (vi) willingness and health to regularly visit the subproject sites; and (vii) proficiency in spoken and written English.

30. **Tasks and deliverables.** Working closely with PMU, the PMU environmental management officer, the international and national safeguard specialist under CS5: Feasibility and Detailed Engineering Design consultant team, and other relevant personnel and agencies, the consultant will assist in all aspects of the implementation of EARF and subproject on IEEs. The consultant will:

- (i) Ensure that the steps in EARF covering environmental screening and impact assessment are followed by PMUs and the CS5: Feasibility Study and Detailed Engineering Design consultants;
- (ii) Deliver training in (a) EARF procedures for screening, and assessing environmental impact (IEEs); and (ii) record-keeping and reporting;
- (iii) Assist the PMU to establish and publicize the GRM for subprojects investments, ensuring that the GRM publicity is appropriate to the scale and complexity of the subproject and includes, as a minimum, the disclosure of all contact persons for lodging complaints;
- (iv) Assist PMU to prepare quarterly (during construction) and semi-annual project monitoring progress reports (otherwise) for submission to ADB;
- (v) Conduct surveys, feasibility studies, and prepare proposals on adaptation;
- (vi) Document local knowledge and best practices in mainstreaming and implementing climate change adaptation and DRR at the commune level;
- (vii) Assist in developing guidelines on integrating climate change adaptation into commune development plans and investment programs; and
- (viii) Organize capacity building events for relevant stakeholders at the provincial, district and commune levels.

n. National Water Management and Irrigation Engineer Specialist (4 individual, 114 person-months, intermittently)

31. **Minimum qualifications.** Preferably have a degree in civil engineering with a major in the design of water management and irrigation systems design; and at least 7 years of professional experience in the climate resilient design, operation and maintenance of water management and irrigation systems, with good knowledge of drip irrigation as well as surface water catchment ponds for supplementary irrigation. The expert will have managerial, analytical and interpersonal skills and a proven ability to communicate clearly in English.

32. **Tasks and deliverables.** The specialist will assist the Team Leader, the Deputy Team Leader, the PMU and MOWRAM and in particular the PMU's civil engineer, PPIUs in the contracting and oversight of the survey and designs related to irrigation systems, drip irrigation and surface water catchment ponds: the work will include the planning of O&M systems with community participation. Detailed tasks will include the following but not limited to:

- (i) Providing necessary technical and management support to the executing agencies for effective project implementation relating to off-farm and on-farm irrigation and water catchment;
- (ii) Assisting in the development of a detailed work plan for the irrigation system's infrastructure activities with the implementation agencies, this includes establishing an appropriate management and monitoring system;
- (iii) Ensuring the sites for support are appropriate, make field trips to confirm eligibility criteria is satisfied and report back to the Team Leader, Deputy Team Leader and PMU;
- (iv) Reviewing the designs prepared by the design consultants and make recommendations for revision and updating the bill of quantities, if necessary;
- (v) Assessing the plan for the construction of the off-farm and on-farm irrigation systems and evaluate requests from PDAFF (drip and water catchment ponds) and PDWRAM (irrigation systems) in relation to the location of the infrastructure in-line with the selection criteria detailed in the PAM. Make field trips to confirm eligibility criteria is satisfied and report back to the team leader, deputy team leader and PMU;
- (vi) Collaborating with those responsible for FWUC capacity building (MOWRAM, PDWRAM and consultants) to develop the training program and wherever possible make recommendations for improvement;
- (vii) Supervise and liaise with the consultants that are contracted to conduct the infrastructure work and offer guidance to them when needed and for each water management and irrigation site assess the compliance to climate resilience in the design;
- (viii) Working with PMU and implementation consultant management on the procurement of drawing up of tender documents, selection of eligible bidders and provide guidance to the procurement selection committee on choice of contractor. The procurement will be in accordance with the Government of Cambodia and ADB Guidelines on Procurement;
- (ix) Monitoring the onsite construction to ensure the work is compliant with the quality required and it will be handed over on-time, if not report back to the PMU highlighting issues identified;
- (x) Proposing appropriate operation and maintenance regimes and options for PPP arrangements; and

- (xi) Contributing to the elaboration and submission of the progress reports for submission to PMU and M&E staff, the frequency of reporting will be in accordance to that specified in the PAM.

o. National Cooperative Storage & Rural Roads Engineer Specialist (4 individuals, 136 person-months, intermittently)

33. **Minimum qualifications.** Preferably have a degree in civil engineering with postgraduate qualifications in the design and oversight of contracts for dry goods storage units and rural roads; and at least 7 years of professional experience in the operation and maintenance of storage units and the repair and maintenance of rural roads and be familiar with climate resilient infrastructure and the use of renewable energy in building design. It is advantageous if h/she has good analytical and interpersonal skills and good communication skills (written and spoken) in English.

34. **Tasks and deliverables.** The specialist will assist in the contracting and oversight of the cooperative storage unit and rural road infrastructure development within the project and the planning of O&M systems including but not limited to the following:

- (i) Provide necessary technical and management support to the executing agencies for effective project implementation relating to cooperative storage units and rural roads;
- (ii) Assist in the development of a detailed work plan for cooperative storage units and rural road infrastructure development in consultation with the implementation agencies, this includes establishing an appropriate management and monitoring system;
- (iii) Review the designs prepared by the PPTA consultants and make recommendations for revision and updating the bill of quantities;
- (iv) Assess the plan for the construction of the cooperative storage units and evaluate the requests from PDAFF and Agricultural Cooperative Promotion for the siting of units. Make field trips to confirm eligibility criteria is satisfied and report back to the team leader, deputy team leader and PMU;
- (v) For each cooperative store that is approved, assess the need to climate resilient rural roads and make recommendations as necessary;
- (vi) Work with the cooperative drying and storage units' capacity building experts and specialist to incorporate design and operation characteristics into the training program for cooperative members and government officials;
- (vii) Supervise and liaise with the consultants that are contracted to conduct the infrastructure work and offer guidance to them when needed;
- (viii) Propose appropriate operation and maintenance regimes and options for PPP arrangements;
- (ix) Provide inputs in the preparation of the bidding documents, evaluation of bids, contract negotiation and contract;
- (x) Monitor the onsite construction to ensure the work is compliant with the quality required and it will be handed over on-time, if not report back to the PMU highlighting issues identified;
- (xi) At handover, submit an O&M plan for the cooperative storage units and lay down guidelines and procedures to ensure O&M is complied with; and
- (xii) Contribute to the progress reports for submission to the PMU and M&E staff, the frequency of reporting will be in accordance to that specified in the PAM.

35. **Reporting Requirements and Time Schedule for Deliverables.** The project implementation period of the consultant services is from effectiveness to project completion and may be extended up to project closing if necessary. Deliverables include:

- (i) **Inception Report** – within 3 months of mobilization – presenting approach to tasks and reporting, with details of how each task will be performed, and identifying what resources will or may be required.
- (ii) **Quarterly Progress Reports (QPRs)** – summarizes the highlights per quarter, the activities undertaken and a summary of disbursements; physical and financial progress of the project; achievement of targets for outputs and inputs defined in DMF, to be submitted within 14 working days of the first month of the succeeding quarter.
- (iii) **Project Performance Monitoring Reports (PPMS)** – shall be submitted every 6 months, highlighting the performance based on the DMF targets.
- (iv) **Borrower's Project Completion Report** – within 6 months from physical completion of the project.
- (v) **Safeguard monitoring reports** – due as required in the project LARF's, EARF's and EMDF (linked documents).
- (vi) **Gender Action Plan**- due as required in the gender action plan linked document.

36. **Client's Input and Counterpart Personnel.** Services, facilities and property to be made available to the consultants by the client:

- (i) All available project reports and data including feasibility reports and detailed engineering design for the three representative subprojects;
- (ii) Office space with furniture and office equipment;
- (iii) Vehicles;
- (iv) For social development and gender, support in organizing field work related to (i) the preparation of required social analysis appendices of subproject feasibility studies; (ii) required social benefit monitoring activities; and (iii) social development and gender awareness capacity building workshops with stakeholders in the target areas; and
- (v) Counterpart staff: In PMU (Coordinating Project Director, Project Manager, Financial Officer, Procurement Officer, Monitoring and Evaluation Officer and administrative officer, from MAFF, MOWRAM, and MRD plus a Safeguard Officer (with Gender) from MAFF.

B. Package CS2: Capacity Building and Climate Smart Agribusiness Consulting Team

37. **Objectives of the assignment.** This package will focus on the following:

- a. **Capacity building and training** will support on farm and formal training within the scope of the project and the management of training resources in coordination of output 2.
- b. **National Agriculture Laboratory Support**–to assist the Plant Bio-Technology Laboratory in (i) developing a GMO and plant toxin analytical capability; (ii) improving the organic and bio-fertilizer testing unit in being able to undertake quality analysis of those types of fertilizers which are produced in the country and that of imported proprietary brands; (iii) introducing cassava tissue TC capability to support private sector enterprises in developing TC businesses; (iv) supporting the ISO17025 accreditation process; and (v) advising the laboratory in transitioning to a commercial enterprise for partial cost recovery. In the four provinces, the

implementation of rapid testing for pesticide residue and plant toxins as part of risk management procedures will be undertaken.

- c. **Renewable energy-** to advise agribusiness to reduce energy costs and support those that are prepared to invest in solar energy (i) through sponsoring feasibility studies on the potential for photo voltaic (PV) energy to reduce energy cost among agribusinesses in the value chain; (ii) the possible selection of 10 agribusinesses that have the potential to reduce cost with PV and that show interest and commitment; and (iii) the linking of such agribusiness with the green financing interventions that are occurring in the country.
- d. **Green Financing** - To promote green finance for climate smart agriculture (CSA) and agribusiness, further develop and implement incentives for private sector participation in climate friendly agribusiness financing and piloting crop insurance.

38. **Scope of works.**

- (i) The development of an agribusiness policy and standards, of which the latter is related to climate smart agriculture (CSA), Cambodia's good agricultural practices CAMGAP and the sustainable rice platform (SRP);
- (ii) The management and operation of provincial agricultural training facilities and mechanization workshops, the facilities of which the project is constructing or rehabilitating;
- (iii) Working with the Cambodian Agricultural Research and Development Institute (CARDI) to commercialize its seed production and distribution activities;
- (iv) On-farm training relating to standards compliance within the value chain, the operation and maintenance (O&M) of agricultural machinery which includes the design and fabrication of hand tools and the O&M of cooperative rice, maize and cassava drying and storage units. In irrigation systems, the O&M of such systems and the establishment and capacity building of Farmer Water User Communities (FWUCs) and laser land levelling within those irrigation systems that are supported;
- (v) Curriculum development and the organization of formal training in the project sponsored mechanization workshops and Provincial Agricultural Development Centers relating to standards compliance, agribusiness, agricultural cooperative accountancy requirements and revenue generation, repair and operation of machinery used in agricultural primary production and primary processing;
- (vi) On-farm training and demonstration initiatives to complement the formal training;
- (vii) Coordination of PPP and private sector activities;
- (viii) In relation to project infrastructure, the agricultural cooperatives will be solar powered, as will the PADDC, and PV will be used in the submersible pumps to supply water to the drip irrigation demonstration sites as such the national and international PV specialists will be recruited to assist. Finally, the biodigester program will provide a valuable source of bio-slurry which, with the proper processing and procedures, can be converted into organic fertilizers. The international bio-slurry expert will assist and support to the program. With guidance from the GDAHP and in close cooperation with PMU and PIC, together with the provincial project implementation units (PPIU);
- (ix) CSA and agribusiness:
 - a. Build the capacity of the financial sector to evaluate climate risk and recognize lending opportunities for bank/MFI lending for climate friendly investments in both the agroforestry and sustainable agriculture sector and the renewable and low-emission energy sector.

- b. Build on the self-regulatory momentum undertaken under the Mekong Sustainable Finance Working Group (USAID project) and the MFI Client Protection Principle.
- c. Strengthen linkages, trust and shared understanding between lenders, borrowers, and input and services providers regarding climate friendly investment opportunities.
- (x) Private Sector Financing Incentives: develop and implement commercial incentives for banks to abide by the agreed best practice and climate change screening principles; and
- (xi) Crop Insurance: support the growth and structure of a few pilot crop insurance schemes currently underway or in planning stages.

39. **Team Composition and Qualification Requirements for Key Experts**

a. **International Policy and Standards Advisor (7 person-months)**

40. **Minimum qualifications.** The advisor will preferably have the following as minimum qualifications: (i) s/he will be qualified to higher degree level in administration, law or international development, and will have worked within the agricultural/agribusiness environments and (ii) s/he will have undertaken policy and standards development tasks within the region. The expert will have good managerial, analytical and interpersonal skills and a proven ability to communicate clearly in English both verbally and in writing.

41. **Tasks and deliverables.** The objective is to (i) support the development of a clear agribusiness policy in order that all stakeholders are aware of their responsibilities and obligations within the sector in which the public and private sectors play complementary roles and (ii) assist in the elaboration of standards that relate to CSA. The scope of work includes:

- (i) In conjunction with the national specialist, the PMU, and implementation agencies, particularly the MAFF and the Ministry of Commerce (MOC), develop an action plan with the outcome of presenting a draft agribusiness policy for endorsement by the Minister MAFF;
- (ii) Review existing policies and strategies, which include (a) ADB Country Partnership Strategy (2014-2018); (b) the Agriculture Sector Strategic Development Plan (2014 - 2018); (c) the Government of Cambodia, Industrial Development Policy (2015 -2025); (d) the Government of Cambodia, Policy on the Promotion of Paddy Production and Rice Export (2010); and (v) Cambodia Climate Change Strategic Plan (2014 - 2023). The work will also include the review of a plethora of climate change policies and strategies, and the draft PPP policy (the latter of which was sponsored by ADB);
- (iii) Work closely with the International CSA, GAP and SRP specialist and review the progress of standards relating to CSA), GAP and SRP; for GAP and SRP standards, work closely with the General Department of Agriculture and the SRP Alliance (UNEP Bangkok), respectively;
- (iv) Work with the national coordinator to make recommendations on an agribusiness steering committee and meeting schedules and retreats, highlighting the topics for discussions and the roles and responsibilities of the nominated agribusiness policy steering committee members;
- (v) Identify synergy with other donor partner projects that have or are developing policies such as JICA and the SME Policy and ADB and the PPP Policy, ADB Rice

- Commercialization Project and the Seed Policy. Assess the lessons learned in the policy development process;
- (vi) Work with PMU, the coordinator on the procurement and costing of retreats and study tours for policy development and technical committees and working groups for standards development. The procurement will be in accordance with the Government of Cambodia and ADB Guidelines on Procurement. It will also include the identification and contracting of private sector service providers; and
- (vii) In conjunction with the National Standards and Policy Development Coordinator, the expert will elaborate and submit the progress reports for submission to the PMU and M&E staff, the frequency of reporting will be in accordance to that specified in the PAM.

b. International Seed Commercialization and Intellectual Property Specialist (5 person-months, intermittently)

42. **Minimum qualifications.** The candidate preferably has a university degree in the biological sciences, business administration or marketing. S/he must have at least 7 years of professional experience within the seed industry and have experience in the commercialization of the seed business with a sound knowledge of intellectual property rights. The expert will have good managerial, analytical and interpersonal skills and a proven ability to communicate clearly in English.

43. **Tasks and deliverables.** The Cambodian Agricultural Research and Development Institute (CARDI) through its Plant Breeding Office (PBO) undertake variety improvement and varietal testing, as well as the production of breeder (foundation) seed. The Institute also bulks up the seed for commercial distribution, however this is not sustainable as the distribution is not undertaken as a commercial enterprise, and this needs to be addressed. The scope of work includes:

- (i) The international expert in conjunction with CARDI director and staff members and the PMU will develop an action plan with the outcome of developing a commercialization strategy and plan for the Institute;
- (ii) Review the existing legal framework relating to seed production, distribution and marketing for rice and other crops such as maize. Pay particular attention to the work being undertaken on the seed industry legal framework by the ADB Loan Project: Rice Commercialization Project;
- (iii) Develop a training program and workshops on the seed industry, institutional commercialization and intellectual property and breeder's rights;
- (iv) Identify synergy with other donor partner projects that have or are assisting government departments or agencies to become special operating agencies or moving towards partial cost recovery and assess lessons learned in the policy development process;
- (v) Work with CARDI and the PMU, on any procurement items that may be needed to fulfil the tasks identified by the Expert. The procurement, including subcontracting service providers will be in accordance with the Government of Cambodia and ADB Guidelines on Procurement;
- (vi) Monitor the procurement program in accordance with the agreement between ADB, MEF and the EA; and
- (vii) Contribute and submit the progress reports through CARDI management for submission to PMU and M&E staff, the frequency of reporting will be in accordance to that specified in the PAM.

c. International GAP, CSA and SRP Training Specialist (9 person-months)

44. **Minimum qualifications.** A university degree in the biological sciences, business administration or marketing and will have post graduate experience in ISO or GAP auditing and certification procedures. S/he must have at least 7 years of professional experience in agricultural production standards compliance and must be familiar with GAP and SRP. Preferably with good managerial, analytical and interpersonal skills and a proven ability to communicate clearly in English.

45. **Tasks and Deliverables.** Building capacity is important in such activities as climate smart agriculture (CSA), standards compliance for GAP and SRP, all of which are required for farmers entering a quality assured value chain, depending on the crop and the level of assurance required, which more and more traders and processors are insisting on particularly in more mature export markets of EU, USA, Japan, Korea and even China. The international expert will develop a capacity-building program related to compliance with the standards being promoted and their certification processes. The scope of work includes:

- (i) Work with the PMU and the national GAP specialist, to develop an action plan with the outcome of elaborating a CAMGAP for tropical fruit, assistance to SRP capacity building work among farmers and cooperative groups, and incorporation of CSA within the standards development and training;
- (ii) For SRP, work closely with Cambodia SRP Alliance members and the United Nations Environment Program (Bangkok);
- (iii) Review the progress of standards relating to CSA, GAP and SRP; for GAP and SRP work closely with the General Department of Agriculture and the SRP Alliance, respectively;
- (iv) Identify synergy with other donor partner projects that have or are developing standards and training farmers on standards compliance such as IFC, SRP Alliance and GIZ and assess lessons learned in the policy development process;
- (v) The expert will provide assistance to the General Department of Agricultural technical committee to develop CAMGAP for tropical fruit and advise on developing a certification scheme using ISO standards;
- (vi) The expert will work and assist the national capacity building coordinators in developing training programs both formal and practical for farmers and government officials;
- (vii) The expert will work closely with the national GAP for tropical fruit specialist to develop and implement a CAMGAP compliance training program;
- (viii) Work with PMU, the coordinators on the procurement and the costing of the capacity building and on-farm training activities. The procurement will be in accordance with the Government of Cambodia and ADB Guidelines on Procurement. Procurement, it will also include the identification and contracting of private sector service providers; and
- (ix) In conjunction with the National Farmer Demonstration Coordinator and the National Capacity Building and Training Coordinator, the experts will contribute and to progress reports for submission to PMU and M&E staff, the frequency of reporting will be in accordance to that specified in the PAM.

d. International Cooperative Agribusiness Training Specialist (6 person-months)

46. **Minimum qualifications.** A university degree in the biological sciences, business administration or marketing and post graduate qualifications in agricultural cooperative development. S/he will be familiar with the legal framework relating to cooperatives; and have at least 7 years of professional experience with working within the cooperative movement or primary production and primary processing agribusiness development. The expert will have good managerial, analytical and interpersonal skills and a proven ability to communicate clearly in English.

47. **Tasks and deliverables.** The project will support the capacity building program for agricultural cooperatives. This will include training in accounting, agribusiness, cooperative management, operation and maintenance of storage units. The international expert will ensure that there is (i) good training needs assessment and coordination; (ii) curriculum and course development; and (iii) cooperative management and agribusiness and business development support, training will include not only agricultural cooperative members but also government officials that are involved in agricultural cooperative development. The scope of work includes:

- (i) Work with the National Training and Capacity Building Coordinator in conjunction with the PMU, to develop a training program for cooperative members for the life of the project, in order that the supported cooperatives can establish or improve on their business activities;
- (ii) Work with the implementation consultants that are involved in the design and engineering of the cooperative storage and drying units and with the National Mechanization and Agribusiness Training Specialist;
- (iii) Undertake training needs assessment to develop a strategy for agricultural cooperative agribusiness training and training;
- (iv) Liaise fully with other national capacity building and training coordinators that have responsibilities for farmer demonstrations, mechanization and agribusiness and PPP. In consultation with the PMU, develop a curriculum and training schedule;
- (v) Provide guidance and oversight for the national training coordinators;
- (vi) In conjunction with other specialists and coordinators, assist in the drafting and publication of training and course materials;
- (vii) Identify synergy with other donor partner projects in relation to training and capacity building work, both formal and in the field, and coordinate activities and utilize third party training materials if applicable and where possible (e.g. JICA cooperative support);
- (viii) Work with the PMU and coordinators on the procurement of capacity building and training materials and equipment. The procurement will be in accordance with the Government of Cambodia and ADB Guidelines on Procurement. It will also include the identification and contracting of private sector service providers;
- (ix) Coordinate with third party private sector training service providers to ensure the capacity building and training work is satisfactory as detailed in the contract;
- (x) Monitor the procurement program in accordance with the agreement between ADB, MEF and the EA; and
- (xi) Contribute to the progress reports for submission to the PMU and M&E staff, the frequency of reporting will be in accordance to that specified in the PAM.

e. International Photo-Voltaic Specialist (4 person-months)

48. **Minimum qualifications.** Post-graduate degree in environmental sciences or renewable energy; and experience with solar photo voltaic application.

49. **Tasks and deliverables.** The services of the international photo voltaic specialist will be undertaken over a 2-year period and the commencement of services is scheduled for mid-2019. Task includes:

- (i) Feasibility study on the potential for photo voltaic to reduce energy cost among agribusinesses in the value chain;
- (ii) Selection of 10 agribusinesses in various sizes that have the potential to reduce cost with photo voltaic and that show interest and commitment;
- (iii) Provide technical input to financing plans and business model for 2-3 of the most promising agribusinesses that are willing to invest in cooperation with the business and financing specialists;
- (iv) Advise the national consultant on selection of photo voltaic companies that could potentially install the photo voltaic rooftop systems;
- (v) Advise the national consultant on the design of solar photo voltaic for cooperatives, agricultural offices and the solar water pumping pilots;
- (vi) Sharing the result with photo voltaic companies, MAFF and the Cambodian Rice Federation; and
- (vii) The international photo voltaic specialist will report to the project director of the PMU. The PMU will support the expert in organizing field work. Furthermore, the expert will work closely with the national counterpart and the business and financing specialists.

f. International Bio-slurry Specialist (4 person-months)

50. **Minimum qualifications.** Post-graduate degree in Environmental Sciences or Agronomy; experience with bio-slurry management and usage; and a good understanding of anaerobic digestion.

51. **Tasks and deliverables.** Undertake the following tasks:

- (i) Develop a tool kit on bio-slurry management taking account compost management and integrated farming practices;
- (ii) Explore and set-up market linkages with private sector for farmers using bio-slurry as organic and climate friendly fertilizer;
- (iii) Develop project implementation documents and guidelines for integrated farming practices;
- (iv) Capacity building of MAFF and GDAPH staff and provincial staff involved in the biodigester construction and bio-slurry use, management and promotion;
- (v) Lead the selection of a laboratory for bio-slurry analysis and advice on application rates for different crops based on the outcome and where necessary by conducting field trials;
- (vi) Explore and promote the use of slurry as bio-pesticide/insecticide and trial applications through field experiments;
- (vii) Work with the PMU and Implementation consultant management on the procurement related to bio-slurry activities; drawing up of tender documents, selection of eligible bidders and provide guidance to the procurement selection committee on choice of contractor. The procurement will be in accordance with the Government of Cambodia and ADB Guidelines on Procurement;
- (viii) Undertake economic analysis of bio-slurry usage as a fertilizer and pesticide;
- (ix) Assist GDAHP with bio-slurry activities where required; and

- (x) The international bio-slurry specialist will report to the project director of the PMU, through the PIC team leader and the coordinator of the bio-digester program. The GDAHP will support the expert in organizing field work.

g. International Biodigester Standards Specialist (3 person-months)

52. **Minimum qualifications.** A university degree in environmental or biological sciences. Experience with domestic biogas and standards development and be familiar with ISO guidelines in developing standards and standard certification schemes

53. **Tasks and deliverables.** Includes:

- (i) Review biodigesters standards as developed under TA-7833 Capacity Building for Efficient Utilization of Biomass for Bioenergy & Food Security of the GMS and develop a briefing paper on the status of the standard and the next steps to be taken towards ratification;
- (ii) With support from the PMU and GDAHP, set-up technical committees and working groups on biogas standards development necessary to support the next steps towards ratification;
- (iii) Provide advice on the implementation arrangements of those standards developed under TA-7833;
- (iv) Prepare a draft biodigester standard on bio-slurry in the form of a working paper for review and comment by the working group and an outline of the implementation issues; and
- (v) Update the draft based on comments received and complete the implementation arrangements and submit the standard for national ratification.

h. International Green Financing Specialist (10 person-months)

54. **Minimum qualifications.** A master's degree or above in business, economics or other relevant disciplines. A minimum of 12 years professional experience in banking sector work, preferably with over 8 years working in the Cambodian banking sector. S/he will have (a) a minimum of 7 years professional experience in climate change project/program design and implementation for bilateral or multilateral donors; (b) experience and deep knowledge of investments/loans and sustainable financing practices; (c) experience working with development institutions supporting the financial sector in Cambodia to support responsible and sustainable growth; (d) experience in forestry practices of Asia, preferably Cambodia, particularly in relation to their role for climate change adaptation and mitigation; (e) previous work experience in Cambodia and clear understanding of the ADB modality of project technical assistance and also of GCF modality of financial support; (f) knowledge of UNFCCC negotiations, NAMA's, NAP's, national REDD strategies and NAPA's and related documents; (g) capacity to assess the forest sector program design against the fiduciary, environmental and social safeguards standards and requirements of the Green Climate Fund (GCF); (h) good background in forest policy, strategy and program development with strong gender components; and (i) fluent in English both verbal and written.

55. **Tasks and deliverables.** To achieve the objectives, activities should include:

- (i) Conduct a comprehensive landscape and key stakeholder analysis to determine implementation activities existing in green climate financing, and the key stakeholders involved in each including implementation agencies and donor partners. Determine what is required to remove financing aversion into green

- climate projects. Analyse potential incentives for financial institutions to increase lending to green climate finance projects. Include research with UNCDF, the GCF Consortium (Conservation International, the World Wildlife Fund, and Wildlife Conservation Society), USAID, DFAT, AFD, and other stakeholders;
- (ii) Design a training program for financial institutions including banks/MFIs to understand environmental and climate screening criteria, and to evaluate loans against these criteria. Training topics could include: (1) What is green lending - identification, benefits and opportunities; (2) Awareness of green climate financing projects and the Cambodia Climate Fund (CCF) operations and requirements; (3) Integration of green climate finance criteria into current credit application process; and (4) reporting on the credit guarantee;
 - (iii) Plan, organize and facilitate a financial institution training and workshop on green climate friendly investments in Cambodia, in coordination with other stakeholders;
 - (iv) Design and manage bank “climate friendly” financing accreditation process. This accreditation process will ensure that banks have climate friendly criteria included in their credit application process. These accredited banks will then become eligible for CCF lending for them to on-lend to climate friendly projects;
 - (v) Conduct field visits with banks to review potential green financing projects.
 - (vi) Conduct awareness workshops and accreditation seminars, as needed;
 - (vii) Consult and coordinate with all stakeholders including the Government of Cambodia (Ministry of Environment, Dept. of Green Energy), environmental supporting NGOs, financial lenders, and the private sector;
 - (viii) Strengthen linkages, trust and shared understanding between lenders, borrowers, and input and services providers regarding climate friendly investment opportunities;
 - (ix) Deliver regular project reporting on a quarterly basis on results achieved, specific roadblocks and challenges, and next steps;
 - (x) Support procurement of a follow-on study of crop insurance schemes to ensure data and insights from the Rice Commercialization study are valid for the focal provinces and crops for the Climate-friendly Agribusiness Value Chains Sector Project;
 - (xi) Support expansion of newly tested crop-insurance models; and
 - (xii) Support procurement and installation of infrastructure to provide accurate and reliable weather information in focus provinces for the Climate-friendly Agribusiness Value Chains Sector Project.
- i. **National Training and Capacity Building Specialist** (60 person-months, intermittently)

56. **Minimum qualifications.** Preferably have the following as minimum qualifications (i) a management and administration qualifications to a higher degree level and be fully conversant with agricultural activities and value chain requirements; and (ii) have proven experience in managing and coordinating capacity building programs particularly in donor sponsored projects and will have good managerial, analytical and interpersonal skills and a proven ability to communicate clearly in English.

57. **Tasks and deliverables.** S/he will be responsible for the project’s capacity building program in relation to standards, cooperative and FWUC organization and the development both on-farm training and demonstrations as well as formal training at the PADCs and mechanization

workshops. The specialist will also manage and liaise with private sector subcontracted trainers. The scope of work includes:

- (i) In conjunction with the PMU, implementation agencies, national specialists, coordinators and international experts will develop a capacity building and training program for the life of the project for standards, cooperative and FWUC organization and development both on-farm and within the PADCs and mechanization workshops;
- (ii) Liaise fully with other national capacity building and training coordinators that have responsibilities for standards and policy, farmer demonstrations, mechanization and agribusiness and PPP. In consultation with the PMU develop a plan and a schedule for frequent review and planning meetings to adjust the plan of activities of required;
- (iii) Develop annual work plans based on the output activities and ensure effective mobilization of experts to meet project implementation plans and targets and revise schedules and TORs where needed;
- (iv) Provide guidance and oversight on the activities of the experts and specialists when mobilized;
- (v) In conjunction with other specialists and coordinators, assist in the drafting and publication of training and course materials;
- (vi) Identify synergy with other donor partner projects in relation to training and capacity building work, both formal and in the field, and coordinate activities and utilize third party training materials if applicable and where possible;
- (vii) Work with the PMU, the specialists and coordinators on the procurement of capacity building and training materials and equipment. The procurement will be in accordance with the Government of Cambodia and ADB Guidelines on Procurement. It will also include the identification and contracting of private sector service providers;
- (viii) Coordinate with third party private sector training service providers to ensure the capacity building and training work is satisfactory and as designated in the service contract;
- (ix) Monitor the procurement program in accordance with the agreement between ADB, MEF and the EA; and
- (x) Contribute in the preparation of progress reports for submission to the PMU and M&E staff, the frequency of reporting will be in accordance to that specified in the PAM. The specialist will undertake the review and consolidation of the individual capacity building specialist reports and submissions.

j. National Farmer Demonstration Specialist (62 person-months)

58. **Minimum qualifications.** A university degree in the agriculture or biological sciences and post graduate training in agricultural extension or training methodology. S/he must have at least 5 years of professional experience in organizing farmer demonstrations and organizing field visits and open days; have sound experience in the operation and maintenance of irrigation schemes and farmer water user group training; and have good managerial, analytical and interpersonal skills and a proven ability to communicate clearly in English.

59. **Tasks and deliverables.** The objective is to ensure the planning of the activities and the practical training on the farm or within irrigations systems is carried out to achieve the maximum benefit to the trainees. The training activities will be coordinated with the formal corresponding training. The scope of work includes:

- (i) In conjunction the National Training and Capacity Building Specialist and the PMU, will develop an action plan for on-farm and FWUC training activities that correspond to the formal training activities relating to mechanization, CSA, drip irrigation and irrigation O&M, as well as cooperative storage O&M;
- (ii) Liaise fully with other national capacity building and training coordinators that have responsibilities for mechanization and agribusiness and PPP. In consultation with the PMU develop a plan and a schedule for frequent review and planning meetings and to adjust the plan of activities of required;
- (iii) Make full use of international experts that are tasked to undertake capacity-building activities in CSA, cooperative agribusiness, FWUCs and machinery operation and maintenance;
- (iv) Provide guidance and oversight for all farm demonstration and training activities including laser land levelling, preparing for training days' open days and field visits;
- (v) In conjunction with other experts, specialists and coordinators, assist in the drafting and publication of on-farm training and course materials;
- (vi) Identify synergy with other donor partner projects in relation to training and capacity building work, both formal and in the field, and coordinate activities and utilize third party training activities if applicable and where possible;
- (vii) Work with the PMU, the experts and coordinator on the procurement of capacity building and training materials and equipment. The procurement will be in accordance with the Government of Cambodia and ADB Guidelines on Procurement. It will also include the identification and contracting of private sector service providers, particularly in drip irrigation and irrigation O&M;
- (viii) Coordinate with third party private sector training service providers to ensure the capacity building and training work is satisfactory as designated in the service contract; and
- (ix) Contribute to the progress reports for submission to the PMU and M&E staff, the frequency of reporting will be in accordance to that specified in the PAM.

k. National GAP for Tropical Fruit Specialist (19 person-months)

60. **Minimum qualifications.** Preferably have a university degree in the biological sciences, business administration or marketing; and at least 5 years of professional experience with agricultural production standards compliance and have experience in tropical fruit production. Advantage to have good managerial, analytical and interpersonal skills and a proven ability to communicate clearly in English.

61. **Tasks and deliverables.** The project will support the development and release of the CAMGAP standard for tropical fruit. Once the standard is released, the training of farmers to become compliant is required so they may enter a quality assured value chain. The scope of work includes:

- (i) Work with the International GAP, CSA and SRP Training Specialist and the PMU, to develop an action plan with the outcome of elaborating a CAMGAP for tropical fruit and undertaking GAP compliance training for farmers and government officials;
- (ii) Assist the International Specialist in reviewing the progress on the preparation of CAMGAP standard for tropical fruit and assist the working groups develop the standard, working closely with the General Department of Agriculture;
- (iii) Identify synergy with other donor partner projects that have or are developing standards and training farmers on standards compliance such as IFC, SRP

- Alliance and GIZ and assess lessons learned in the standards development process;
- (iv) Provide assistance to the General Department of Agricultural technical committee to develop CAMGAP for tropical fruit and advise on developing a certification scheme using ISO standards signal;
 - (v) Assist the national training and capacity building specialist in developing CAMGAP training programs both formal and practical for farmers and government officials;
 - (vi) Work with the PMU, the international specialist, and the national training and capacity building specialist on the procurement and the costing of the capacity building and on-farm training activities. The procurement will be in accordance with the Government of Cambodia and ADB Guidelines on Procurement. It will also include the identification and contracting of private sector service providers; and
 - (vii) Assist the International Policy and Standards Advisor in the preparation of the progress reports for submission to the PMU and M&E staff, the frequency of reporting will be in accordance to that specified in the PAM.

I. National Farmer Water User Community Training Specialist (37 person-months)

62. **Minimum qualifications.** A university degree in the biological sciences, business administration or marketing and will be familiar with irrigation systems and their O&M; and at least 5 years of professional experience working within the O&M of irrigation systems the setting up of farmer water user communities (FWUC) and capacity building FWUC to manage and operate the systems, which include the collection of fees and the assignment of tasks within the membership. Good managerial, analytical and interpersonal skills and a proven ability to communicate clearly in English.

63. **Tasks and deliverables.** The objective of the work is to ensure that those irrigation systems that are rehabilitated by the project the FWUCs are in place and have satisfactory capability to undertake the O&M of the schemes. The scope of work includes:

- (i) In conjunction with the National Training and Capacity Building Specialist and in close coordination with the PMU, will develop an implementation and a capacity building and training program for the life of the project to support the establishment of FWUCs or the enhancement of FWUCs in the O&M of irrigation schemes;
- (ii) Liaise fully with national capacity building and training specialists that have responsibilities for capacity building within farmer groups and on-farm demonstrations to coordinate activities;
- (iii) In conjunction with other specialists and coordinators, assist in the drafting and publication of training and course materials;
- (iv) Identify synergy with other donor partner projects in relation to training and capacity building of FWUCs, coordinate activities, and utilize third party training materials, if applicable and where possible. Also, based on the donor partner project experience working with FWUCs consider lessons learned and develop procedures to alleviate problems encountered previously in similar projects;
- (v) Work with the PMU and specialists on the procurement of capacity building and training materials and equipment. The procurement will be in accordance with the Government of Cambodia and ADB Guidelines on Procurement. It will also include the identification and contracting of private sector service providers;
- (vi) Coordinate with third party private sector training service providers to ensure the capacity building and training work is satisfactory as detailed in the contract; and

- (vii) Contribute to the progress reports for submission to the PMU and M&E staff, the frequency of reporting will be in accordance to that specified in the PAM.

m. National Agricultural Machinery Operations and Maintenance Training Specialist (54 person-months)

64. **Minimum qualifications.** A university degree in agricultural or mechanical engineering and has worked in the private sector for agricultural machinery manufacturers or contractors; and s/he must have at least 7 years of professional experience in the repair and maintenance of agricultural machinery and have knowledge in agricultural tools and equipment design and fabrication. The expert will have good managerial, analytical and interpersonal skills and a proven ability to communicate clearly in English.

65. **Tasks and deliverables.** The objective is to work within the project-sponsored workshop to develop training courses and on farmers' fields to provide demonstrations in conjunction with national and international agricultural machinery importers and distributors. The scope of work includes:

- (i) In coordination with the National Training and Capacity Building Specialist and with support from the MAFF Department of Agricultural Engineering develop ideas for agricultural machinery, hand tool, biomass power generation equipment design and fabrication at the project's machinery workshops;
- (ii) Assess the existing situation with respect to primary production and primary processing machinery and equipment operation, maintenance and fabrication;
- (iii) Liaise with other specialists that have inputs on farmer demonstrations, mechanization and agribusiness and PPP/private sector, to coordinate activities. S/he will work closely with the National Mechanization and Agribusiness Training Specialist;
- (iv) In coordination with other specialists and coordinators, assist in the drafting and publication of training and course materials;
- (v) Identify synergy with other donor partner projects in relation to training and capacity building work, both formal and in the field, and coordinate activities and utilize third party training materials, if applicable and where possible;
- (vi) Identify private sector companies that import and or distribute agricultural machinery and if feasible, utilize the services of the more competent companies to undertake training on behalf of the project;
- (vii) Work with the PMU, specialists and coordinators on the procurement of mechanization capacity building and training materials and equipment. The procurement will be in accordance with the Government of Cambodia and ADB Guidelines on Procurement. It will also include the identification and contracting of private sector service providers;
- (viii) Coordinate with third party private sector training service providers to ensure the capacity building and training work is satisfactory as detailed in the contract; and
- (ix) Contribute to the progress reports for submission to the PMU and M&E staff, the frequency of reporting will be in accordance to that specified in the PAM

n. National Public Private Partnership Specialist (30 person-months)

66. **Minimum qualifications.** A university degree in business administration or marketing and has worked within producer or processor federation, associations; and at least 5 years of professional experience working with private sector groups and associations and has in-depth

knowledge of private sector forums getting the maximum benefit out of the groups or trade and product forums. Have good managerial, analytical and interpersonal skills and a proven ability to communicate clearly in English.

67. Tasks and deliverables. Bring PPP partners (the MAFF/other Ministries and the private agribusiness committee) together to discuss and agree on PPP priorities, with forums for each value chain (rice, cassava, maize, and mango), organize for stakeholders in PPP on regional ASEAN study tours, screen potential partners, arrange bidding arrangements for developing those PPPs agreed on; the project will also support inter-ministerial meetings to further PPP and improve private sector feedback. The scope of work includes:

- (i) Develop an action plan and submit it to the PMU. The plan will consist of arranging the meeting schedule as recommend by the design consultants, and a review of the frequency, type of meetings and recommendations of the participants to be invited;
- (ii) Arrange PPP Inter-ministerial committee meetings, crop centric meeting and agribusiness workshops. S/he will be responsible for recording the minutes of all meetings;
- (iii) Identify synergy with other donor partner projects in relation to PPP private sector forums particularly the work supported by JICA, World Bank and IFC;
- (iv) Undertake an annual costing exercise to present to the PMU to fund the activities within the PPP and private sector participation initiatives. The procurement will be in accordance with the Government of Cambodia and ADB Guidelines on Procurement. It will also include the identification and contracting of private sector service providers or guest speaker to present at some workshop and forums;
- (v) Coordinate with third party private sector training service providers to ensure the capacity building and training work is satisfactory as detailed in the contract;
- (vi) The specialist will plan, develop and ensure implementation of the assessment of PPP pre-investment proposals, by hiring consultants to undertake the feasibility studies within the first 3 years of the project;
- (vii) Plan a regional ASEAN study tour that will involve a total of about 50 stakeholders who will visit different sites in the region to acquire a better knowledge of how a new technology works, its availability, and what market opportunities there may be for a product; and
- (viii) Contribute to the progress reports for submission to the PMU and M&E staff, the frequency of reporting will be in accordance to that specified in the PAM. When work programs overlap concerning the agribusiness policy, the progress reports will require an input from the International Policy and Standards Advisor.

o. National Policy and Standards Advisor (36 person-months, intermittently)

68. Minimum qualifications. Preferably a master's degree level in administration, law or international development, and have worked within the agricultural/agribusiness environments. Familiar with the Industrial Development Policy and the Agriculture Development Sector Strategy and will have undertaken similar tasks in Cambodia. The coordinator will also be conversant with ISO standards that relate to product and process standards and the certification processes that complement standards development. The expert will have good managerial, analytical and interpersonal skills and a proven ability to communicate clearly in English.

69. Tasks and deliverables. To work with the international advisor to (a) support the development of a clear agribusiness policy in order that all stakeholders are aware of their

responsibilities and obligations within the sector in which the public and private sectors play complementary roles; and (b) assist in the elaboration of standards that relate to CSA. The scope of work includes:

- (i) In coordination with the international policy and standards advisor, the PMU, and the implementation agencies, particularly MAFF and the Ministry of Commerce (MOC), to develop an action plan with the outcome of presenting a draft agribusiness policy for endorsement by the Minister of (MAFF;
- (ii) Review existing policies and strategies, which include: (i) ADB Country Partnership Strategy (2014-2018); (ii) the MAFF Agriculture Sector Strategic Development Plan (2014 - 2018); (iii) Industrial Development Policy (2015 -2025) of Cambodia; (iv) Policy on the Promotion of Paddy Production and Rice Export (2010) of Cambodia; and (v) Cambodia Climate Change Strategic Plan (2014 - 2023). The work will also include a review of the climate change policies and strategies and the draft PPP policy;
- (iii) Work closely with the international GAP, CSA & SRP Specialist and review the progress of standards relating to GAP, SRP and CSA; for GAP and SRP work closely with the General Department of Agriculture and the SRP Alliance respectively;
- (iv) Under the guidance of the international policy and standards advisor make recommendations on an agribusiness policy steering committee and meeting schedules and retreats, highlighting the topics for discussions and the roles and responsibilities of the nominated agribusiness policy steering committee members;
- (v) Identify synergy with other donor partner projects that have or are developing policies such as JICA and the SME Policy and ADB and the PPP Policy, ADB Rice Commercialization Project and the Seed Policy and assess lessons learned in the policy development process;
- (vi) Work with the PMU, and the international policy and standards advisor on the procurement and costing of retreats and study tours for policy development and technical committees and working groups for standards development. The procurement will be in accordance with the Government of Cambodia and ADB Guidelines on Procurement. Procurement, it will also include the identification and contracting of private sector service providers.
- (vii) Contribute to the progress reports for submission to the PMU and M&E staff, the frequency of reporting will be in accordance to that specified in the PAM.

p. National Photo-Voltaic Specialist (12 person-months)

70. **Minimum qualifications.** Graduate degree in environmental sciences or renewable energy; and experience with solar photo voltaic application.

71. **Tasks and deliverables.** Includes

- (i) Assist the international counterpart specialist in preparing the feasibility study on the potential for photo voltaic to reduce energy cost among agribusinesses in the value chain;
- (ii) Lead the selection of 10 agribusinesses that have the potential to reduce costs with photo voltaic and that show interest and commitment;
- (iii) Provide technical input to financing plans and business models for 2 or 3 of the most promising agribusinesses that are willing to invest in cooperation with the business and financing specialists;
- (iv) Sharing of results with the selected agribusiness;

- (v) Assess potential grid feed-in opportunities with the national business and financing specialist;
- (vi) Selection of photo voltaic companies that could potentially install the photo voltaic rooftop systems;
- (vii) Advise on the integration of solar photo voltaic in the cooperatives and the provincial offices in close cooperation with the selected solar photo voltaic company;
- (viii) Advise on the implementation of the solar water pumping pilots, including design, photo voltaic company selection and construction;
- (ix) Sharing the result with photo voltaic companies, MAFF and the Cambodian Rice Federation; and
- (x) The national photo voltaic specialist will report to the Project Director of the PMU. The PMU will support the expert in organizing field work. Furthermore, the expert will work closely with the national counterpart and the business and financing specialists.

q. National Bio-slurry Specialist (34 person-months)

72. **Minimum qualifications.** A university degree in environmental sciences or agronomy; experience with bio-slurry management and usage; and a good understanding of anaerobic digestion.

73. **Tasks and deliverables.** Includes:

- (i) Assist the international bio-slurry specialist in developing a bio-slurry management toolkit taking account of composting huts and integrated farming practices;
- (ii) Explore and setup market linkages for farmers using bio-slurry as organic and climate friendly fertilizers by working closely with private sectors and other relevant partners;
- (iii) Assist in the capacity building activities of MAFF/DAPH staff and provincial staff involved in bio-slurry use, management and promotion;
- (iv) Assist in the development of Bio-slurry training curricula and marketing and promotion materials;
- (v) Support and run biogas farmer and biodigester company training on the effective use of bio-slurry;
- (vi) Assist the international bio-slurry specialist on bio-slurry analysis and the recommended application rates for different crops;
- (vii) Explore the use of slurry as bio-pesticide/insecticide and promote the practice;
- (viii) Together with the International bio-slurry specialist undertake the economic analysis of bio-slurry usage as fertilizer and pesticide;
- (ix) Assist the international bio-slurry specialist in determining procurement needs related to bio-slurry activities;
- (x) Assist GDAHP with the implementation of their bio-slurry activities in close cooperation with the nominated biodigester coordinator within MAFF;
- (xi) Attend monthly coordination meetings in the province and;
- (xii) Work with the National Biodigester Program Coordinator (NBP). The NBP will support the expert in organizing field work

r. National Green Financing Specialist (36 person-months)

74. **Minimum qualifications.** At least a master's degree in business, economics or other relevant disciplines or higher. The candidate must have: (i) a minimum of 6 years professional experience in the banking sector work in Southeast Asia, preferably in the Cambodian banking sector; (ii) a minimum of 4 years professional experience in climate change project/program design and implementation for bilateral or multilateral donors; (iii) experience and knowledge of investments/loans and sustainable financing practices; (iv) experience working with development institutions supporting the financial sector in Cambodia to support responsible and sustainable growth; (v) experience in forestry practices of Asia, preferably in Cambodia, particularly in relation to their role for climate change adaptation and mitigation; (vi) previous work experience in Cambodia and clear understanding of the ADB modality of project technical assistance and also of GCF modality of financial support; (vii) knowledge of UNFCCC negotiations, NAMA's, NAP's, national REDD strategies and NAPA's and related documents; (viii) capacity to assess the forest sector program design against the fiduciary, environmental and social safeguards standards and requirements of the Green Climate Fund (GCF); (ix) good background in forest policy, strategy and program development with strong gender components; and (x) fluent in English and Khmer both verbal and written.

75. **Tasks and deliverables.** In collaboration with the International Green Financing Specialist, the national expert will:

- (i) Conduct a comprehensive landscape and key stakeholder analysis to determine implementation activities existing in green climate financing, and the key stakeholders involved in each including implementation agencies and donor partners. Determine what is required to remove financing aversion into green climate projects. Analyse potential incentives for financial institutions to increase lending to green climate finance projects. Include research with UNCDF, the GCF Consortium (Conservation International, the World Wildlife Fund, and Wildlife Conservation Society), USAID, DFAT, AFD, and other stakeholders; Design a training program for financial institutions including banks/MFIs to understand environmental and climate screening criteria, and to evaluate loans against these criteria. Training topics could include: (1) What is green lending - identification, benefits and opportunities; (2) Awareness of green climate financing projects and the Cambodia Climate Fund (CCF) operations and requirements; (3) Integration of green climate finance criteria into current credit application process; (4) Reporting on the credit guarantee;
- (ii) Plan, organize and facilitate a financial institution training and workshop on green climate friendly investments in Cambodia, in coordination with other stakeholders;
- (iii) Design and manage bank "climate friendly" financing accreditation process. This accreditation process will ensure that banks have climate friendly criteria included in their credit application process. These accredited banks will then become eligible for CCF lending for them to on-lend to climate friendly projects;
- (iv) Conduct field visits with banks to review potential green financing projects. Conduct awareness workshops and accreditation seminars, as needed;
- (v) Consult and coordinate with all stakeholders including the Government of Cambodia (Ministry of Environment, Department of Green Energy), environmental supporting NGOs, financial lenders, and the private sector;
- (vi) Strengthen linkages, trust and shared understanding between lenders, borrowers, and input and services providers regarding climate friendly investment opportunities;
- (vii) Deliver regular project reporting on a quarterly basis on results achieved, specific roadblocks and challenges, and next steps;

- (viii) Support procurement of a follow-on study of crop insurance schemes to ensure data and insights from the Rice Commercialization study are valid for the focal provinces and crops for the Climate-friendly Agribusiness Value Chains Sector Project;
- (ix) Support expansion of newly tested crop-insurance models; and
- (x) Support procurement and installation of infrastructure to provide accurate and reliable weather information in focus provinces for the Climate-friendly Agribusiness Value Chains Sector Project

s. National Laboratory Commercialization Specialist (3 person-months)

76. **Minimum qualifications.** A university degree in the biological sciences, business administration or marketing; and s/he must have at least 7 years of professional laboratory experience in the commercialization of a testing laboratory and the development of business plans and marketing. Have good managerial, analytical and interpersonal skills and a proven ability to communicate clearly in English.

77. **Tasks and deliverables.** To promote and establish a commercial ethos within the Plant Biotechnology Laboratory (PBL), to ensure the laboratory will achieve partial cost recovery for its services. The tasks will include:

- (i) Conduct and develop training programs on laboratory commercialization, the elaboration of business plans and marketing laboratory services;
- (ii) Assess the laboratories in the country and identify possible overlaps in testing capability that may create competition;
- (iii) In coordination with the national laboratory coordinator review the legal framework and determine the possibility of the BPL becoming a special operating agency or similar;
- (iv) With the National Agricultural Laboratory management, assist in the drafting of a business plan during the first year of full implementation to be used as a template in successive years;
- (v) Taking into consideration the -National Tissue Culture Development Specialist's recommendations, determine the means in which the developed TC methods, under this TA, can be passed on to commercial enterprises under license from the National Agricultural Laboratory; and
- (vi) Prepare a business plan, present a strategy/plan for commercialization and to contribute to the progress reporting of the PBL sub-output and contribute to the activity monitoring requirements

t. National Biofertilizer and Organic Fertilizer Testing Specialist (4 person-months)

78. **Minimum qualifications.** A science degree in the biological sciences. At least 5 years of professional experience in the field bio and organic fertilizers, knowledge of organic crop production will be an advantage; and proven experience in testing of bio-fertilizers and organic fertilizers and skills in developing the corresponding standards and setting the tests against the standards required. Have good managerial, analytical and interpersonal skills and a proven ability to communicate clearly in English. Regional experience in the field of organic and bio-fertilizers is an advantage.

79. **Tasks and deliverables.** Establish a testing regime for organic and biofertilizers and assist in developing a standard with which the testing will comply with, together with advising the necessary equipment and materials to undertake the analysis recommended. This is to monitor products on the market and verify manufacturer claims. When a product is registered as an organic fertilizer with the Department of Agricultural Legislation of MAFF, there are no testing protocols to ensure product quality, this need to be rectified. The tasks include:

- (i) Undertake a market assessment of the organic and biofertilizers, which includes local producers and highlight the current organic and biofertilizer product registration process, to include legal instruments used in the registration process;
- (ii) Work with the national laboratory coordinator and PBL management to review testing equipment and material needs and make recommendations to the PMU, elaborate the tender documents according the government and ADB procurement guidelines;
- (iii) Develop testing manuals for those tests that are considered necessary and make recommendations for those tests to be incorporated into an organic and biofertilizer quality standard; and
- (iv) Expected output includes the development of testing protocols for testing organic and bio fertilizers that can be used in a testing standard and a contribution to the PMU progress reporting and contribute to the activity monitoring requirements, as required.

u. National Tissue Culture Development Specialist (3 person-months)

80. **Minimum qualifications.** A science degree in the biological sciences (applied biology or microbiology) and practical tissue culture (TC) experience; and at least 5 years of commercial tissue culture experience, having worked in a successful, preferably a private sector TC business enterprise. Have good managerial, analytical and interpersonal skills and a proven ability to communicate clearly in English both verbally and in writing.

81. **Tasks and deliverables.** Develop meristem TC protocol or protocols for production of cassava to clean up stocks (from Mosaic Virus and mycoplasma - Witches Broom) and use those protocols to transfer the technology to private sector companies that would use the TC methods as a business enterprise under license from the National Agricultural Laboratory. The tasks to undertake will include:

- (i) Propose methods of cassava TC by using meristems derived in vivo plantlets and leaves grown under environmentally controlled conditions;
- (ii) Work with the national coordinator and PBL management to review TC equipment and material needs and make recommendations to the PMU, elaborate the tender documents according to the government and ADB procurement guidelines. The procurement will include not only TC laboratory equipment and materials but also, structures to make the TC laboratory aseptic and the supply and erection of plantlet weaning facilities;
- (iii) Develop a TC manual for cassava and if there is sufficient time, other crops or ornamentals that will benefit from TC and have a commercial potential;
- (iv) In conjunction with the National Laboratory Commercialization Expert, elaborate a strategy and business plan for the transfer of technology and the commercialization of the process through licensing to the private sector; and
- (v) Develop a strategy, plan and description of the TC methodology. S/he will contribute to the progress reporting, as required by the PMU and contribute to the activity monitoring requirements.

v. National GMO and Phytotoxin Analysis Specialist (3 person-months)

82. **Minimum qualifications.** A science degree in the biological sciences and practical laboratory capacity building experience; and at least 7 years of experience in the testing of GMO and phytotoxins related to rice, maize and cassava. The advisor will have good managerial, analytical and interpersonal skills and a proven ability to communicate clearly in English. Regional laboratory analytical experience or capacity building would be an advantage.

83. **Tasks and deliverables.** Work within the Plant Biotechnology Laboratory (PTL) to ensure the management and analysts are capable of testing GMO and phytotoxins with the equipment provided by the project. The overriding aim is to develop systems, administration and management structures so the laboratory to apply for accreditation for, at least those two tests. The tasks will be:

- (i) Undertake training needs assessment of the analytical staff nominated for the testing of GMOs and phytotoxins. Make recommendations on training laboratory staff in line with ISO 17025 guidelines, based on the new testing equipment procured, and wherever possible lead the training activities;
- (ii) Identify regional laboratories that could cater for exposure and capacity building activities and if required arrange secondment of staff to those locations when required;
- (iii) In coordination with the national laboratory coordinator and PBL management to review testing equipment and material needs proposed, revise if required and make recommendations to the PMU, elaborate the tender documents according to the Government of Cambodia and ADB procurement guidelines;
- (iv) When the testing capability is determined sufficient, identify and enroll the laboratory in a relevant inter-proficiency testing program, if possible within the region;
- (v) Develop testing manuals for GMO and phytotoxins and ensure test protocols are based on the Association of Official Analytical Chemists (AOAC) methods; and
- (vi) Development of testing protocols for GMO and phytotoxins and contribute to the progress reports when requested by the national coordinator and PMU and contribute to the activity monitoring requirements.

w. National ISO17025 Accreditation Compliance Specialist (7 person-months)

84. **Minimum qualifications.** A degree in the biological sciences and the necessary and current ISO17025 accreditor certification qualifications. Have proven experience in being an ISO17025 accreditation auditor, preferably within the South Asia or South East Asia Region. Have acted as a consultant in advising laboratories in seeking ISO17025 accreditation; and have good managerial, analytical and interpersonal skills and a proven ability to communicate clearly in English both verbally and in writing.

85. **Tasks and deliverables.** Related to advising and putting systems in place at the PBL to seek ISO17025 accreditation for GMO and plant toxin testing, in order that Cambodia has in-country capability of those tests to satisfy rice, maize and cassava processor and exporter demands for a test that is mutually recognized. The tasks will be:

- (i) Working closely with the national laboratory coordinator, develop a strategy and work plan to get the PBL ready for ISO17025 accreditation;

- (ii) Assist in the training of laboratory staff (a) in line with ISO 17025 guidelines and based on the new testing equipment procured and (b) in business development and commercialization planning.
- (iii) Assist in the preparation of the quality and technical manuals for ISO17025 accreditation;
- (iv) With the GMO and phytotoxin Analysis Specialist, ensure test protocols are based on the Association of Official Analytical Chemists (AOAC) methods;
- (v) Advise on the laboratory orientation and reconfiguration in conjunction with the national GMO and phytotoxin Analysis Specialist;
- (vi) Work with the PMU and the procurement specialist for facilities related to laboratory orientation and elaborate the tender documents according the Government of Cambodia and ADB procurement guidelines.
- (vii) Together with the relevant specialists, develop the tender documents for contracting an internationally recognized ISO17025 accreditation body (AB) and make recommendations to the PMU on the AB shortlist;
- (viii) With the national GMO and phytotoxin Analysis Specialist, recommend and follow up results for laboratory proficiency testing for GMO and phytotoxin testing;
- (ix) Submit strategies and plans, training need requirements and training course completion;
- (x) Contribute to the progress reports for submission to PMU.

x. National Laboratory Coordinator (46 person-months)

86. Minimum qualifications. A science degree in the biological sciences and practical analytical bench testing and laboratory capacity building experience. S/he must have at least 5 years of professional experience in the field in Cambodia. Have proven experience in life sciences laboratory testing and has experience in the commercialization of a testing laboratory. Have good managerial, analytical and interpersonal skills and a proven ability to communicate clearly in English both verbally and in writing. Regional laboratory experience or training would be an advantage.

87. Tasks and deliverables. Ensure that the PBL technical assistance program is implemented and the maximum benefit is gained from the mobilization of the international experts. In periods where experts are not mobilized, s/he will work with the management and analysts of the laboratory to maintain effective implementation, ensure recommendations are followed and progress made. The tasks will include:

- (i) Develop a work plan based on the PBL activities and ensure effective mobilization of experts to meet project implementation plan targets and revise schedules and TORs where needed;
- (ii) Assist the international experts in the process of commercialization and developing the technical and administration manuals and business plans that will contribute to ISO17025 accreditation and commercialization process respectively;
- (iii) Work with the PMU and the experts for the procurement of laboratory and tissue culture materials and equipment. The procurement will be in accordance with the Government of Cambodia and ADB Guidelines on Procurement;
- (iv) Together with the relevant experts, develop the tender documents for contracting an internationally recognized ISO17025 accreditation body and make recommendations to the PMU on shortlisted accreditation body;
- (v) Support the BPL in the laboratory proficiency testing for GMO and phytotoxin testing;

- (vi) Assist in the training of laboratory staff (a) in line with ISO 17025 guidelines and based on the new testing equipment procured and (b) business development and commercialization planning. When necessary, lead the training activities in Khmer;
- (vii) Contribute to the progress reports for submission to PMU; and
- (viii) Consolidate reports from BPL management.

88. **Reporting requirements and time schedule for deliverables.** The project implementation period of the consultant services is 72 months. Deliverables include:

- (i) **Action and work plans:** Within 2 months of mobilization the team will prepare an action plan and first year work plans that will be elaborated with the support of PIC and PMU to determine the approach to their respective scopes of work and how each task will be undertaken, identifying what physical and financial resources will or could be required
- (ii) **Quarterly progress reports (QPRs).** Contribute to the project's QPRs, which will summarize activities undertaken, impediments to effective implementation, progress in achieving targets for the outputs and inputs defined in DMF, to be submitted within one week of the first month of the succeeding quarter for collation by PMU.
- (iii) **Project performance monitoring reports (PPMS).** The team will submit information and data to PIC and PMU relating to DMF targets for consolidation into PPMS.
- (iv) **Safeguard monitoring reports.** Contributions to the safeguard monitoring reports will be undertaken within the scope of the project's LARFs, EARFs and EMDF (linked documents) and as required by those safeguard and social development experts and specialists.
- (v) **Gender action plan.** Oversee compliance with GAP and highlight deviations from and the reason or rationale of such deviations.
- (vi) **Final reports.** Summarize the activities undertaken-and list recommendations for further implementation to ensure a satisfactory conclusion to the work/output. Any deviation from the work plan should be provided with an explanation.

89. In addition to above, specific green financing technical deliverables are also to be submitted:

- (i) CSA and agribusiness (Activity year 2 – year 4: completed 1st quarter year 5)
 - a. Finalized green financing landscape and key stakeholder analysis report;
 - b. Training program designed and implemented for financial institutions including banks/MFIs to understand environmental and climate screening criteria, and to evaluate loans against these criteria; and
 - c. Accreditation process for climate friendly financing designed and implemented for financial institutions. Minimum of 20 financial institutions accredited after adopting voluntary standards.
- (ii) Private Sector Financing Incentives (Activities year 2 – year 3: completed 3rd quarter year 3)
 - a. Commercial incentives for banks designed and launched to abide by the agreed best practice and climate change screening principles.
- (iii) Crop Insurance (Activity 2nd quarter year 2 – 1st quarter year 3: completion 2nd quarter year 3)
 - a. Finalize design and implementation of a scale-up program for crop insurance schemes in focal provinces in Cambodia, including:

- b. Procurement of a follow on study of crop insurance schemes to ensure data and insights from the Rice Commercialization study are valid for the focal provinces; and
 - c. Procurement of pilot expansion projects of crop insurance models in the focal provinces; and procurement of infrastructure to provide on-going accurate and reliable weather information.
- (iv) Ratified biodigester standard as developed under TA-7833 by the National Institute of Standards;
 - (v) Bio-slurry standard;
 - (vi) Bio-slurry toolkit;
 - (vii) Solar PV feasibility report;
 - (viii) Technical input to the financing plan and any other reports as required and requested by PMU;
 - (ix) Economic analysis report and any other reports as required and requested by PMU and GDAHP; and
 - (x) Any other reports as required and requested by PMU and GDAHP, which will include: (i) action and work plans within 1 month of mobilization elaborated by the International PV Expert, National Bio-slurry Specialist and the International Biodigester Standards Expert; (ii) it is the responsibility of the national and international specialists and experts, when in-country, as well as GDAHP officials to contribute to the quarterly progress reports which will summarize activities undertaken, impediments to effective implementation, progress in achieving targets for the outputs and inputs defined in DMF (*At least 12,000 additional bio-digesters and 6,000 compost huts made operational and the biodigester and bio-slurry standard endorsed as a Cambodian standard with the CS mark*), to be submitted within one week of the first month of the succeeding quarter for collation by the PMU; (iii) contribution to the Project Performance Monitoring Reports (PPMS), safeguard monitoring reports and the Gender Action Plan; and (iv) at the end of the expert's last mission, a report will be produced by the individual highlighting activities undertaken, progress and recommendations for further implementation to ensure a satisfactory conclusion to the work. Any deviation from the work plan should be detailed explaining the reasons for delay.

90. **Client's Input and Counterpart Personnel.** Services, facilities and property to be made available to the consultants by the client:

- (i) All available project reports and data including ministry annual reports, feasibility reports and detailed engineering design for the three representative subprojects;
- (ii) All available project reports and data including progress and completion reports of other national agriculture laboratory, green financing, donor support projects (World Bank, AusAID/DFAT, NZAID, JICA, ADB, etc.)
- (iii) Office space with furniture and office equipment; it is expected that team will be spread across the three implementing ministries and therefore spaces will need to be provided either within the PMU offices in each ministry or within specialist departments related to the team's work
- (iv) Vehicles or funding to hire vehicle will be provided
- (v) Counterpart staff from each line ministries and implementing agencies.
- (vi) Counterpart staff will also be made available from CARDI, Department of Agricultural Engineering, Department of Agricultural Cooperative Promotion and

other departments relating to standards and policy development, agribusiness and contract farming.

C. Package CS3: Variety Development Consulting Firm by the International Rice Research Institute (IRRI)

91. Cambodia is one of the most vulnerable countries in the world to climate change. Agriculture sector is one of the most vulnerable sectors to such impacts. The climate change events reflected in terms of increased frequencies of temperature extremes, frequent droughts, floods, and increased salinity have already started affecting agricultural production and productivity and particularly more so in marginal or low input environments like Cambodia.

92. The climate friendly agribusiness value chains sector project aims to support the Cambodian Agricultural Research and Development Institute (CARDI) in production and multiplication of climate resilient varieties of rice, maize, cassava and mango. In addition, assistance will be provided to CARDI to develop a commercialization program with recommendations on the legal framework to develop intellectual property rights and partial cost recovery for the institution.

93. The climate resilient traits to be selected in new varieties shall include shorter maturity duration, tolerance to drought, tolerance to high temperature, tolerance to prolonged flooding, anaerobic germination, as well as traits supporting better adaptation to water saving cultivation practices- dry direct seeding and alternate wetting and drying. This will not be a basic plant breeding program which will take 10 years to develop. Instead, the focus would be on testing available climate resilient lines within a 5-year program that includes continued selection, agro-climatic adaptation, climate resilient trait evaluations, yield comparisons and farmer and processor evaluation. Ensuring the availability of quality seed of climate resilient varieties in adequate quantity at right time poses greater challenge rather than production per se.

94. The project will also support large scale seed multiplication of climate resilient varieties for each target crop in target provinces and distribution of quality seed to farmers. For example, new rice varieties suitable for direct seeding, and for alternate wetting and drying technologies will be demonstrated together with the full technology package on about 100 hectares in each target province. The project will recommend standards for seed certification procedures for different grades of seed, and seed certification procedures for the approval of and implementation by the government.

95. By 2024, it is expected that at least two climate resilient rice varieties and one climate resilient glutinous maize variety would be released for commercial production; and that CARDI would be able to achieve partial cost recovery in variety development and foundation seed supply with the corresponding legal framework in place. The project will develop seed quality standards, seed certification standards for different classes of seeds for the four crops and maintain such standards in the quality seed production in the current project.

96. The scope of work also covers the development and dissemination of climate smart agriculture (CSA) practices including improved land-water-nutrient management and crop establishment practices. The work includes dissemination of mechanized cultivation practices that have reduced risk and drudgery and generate avenues for employment for youth and women farmers. The project will work closely with CARDI and other key institutions as well as private-sector partners for the deployment of the climate resilient varieties and technology of different

crops. In addition, the work includes efforts to reduce postharvest losses during harvesting, drying, storage, and processing through implementation of modernized post-harvest practices, capacity development and training on postharvest technology, and the development of linkages between the public and private sector.

97. An international research institution of high repute will be recruited to deliver the above services. Based on assessment of various institutions in the region focusing on development and deployment of climate resilient varieties, and substantial contributions made so far on climate smart agriculture in various countries including Cambodia, it is proposed to select the International Rice Research Institute (IRRI) to deliver the above services. The detailed terms of reference will be developed by CARDI with cooperation from the project implementation consultants during the first year of project implementation after assessing needs of target crops in target provinces.

98. IRRI has been working with Cambodia since 1986 and on crops and climate change research since 1991 – a time when climate change was considered a marginal topic within agriculture research. The Institute has defined a coherent research portfolio on climate change emphasizing on three areas: adaptation, mitigation, and policy. This sets crop production into the broader context of food supply and food security alongside socioeconomic issues, such as rural development and gender mainstreaming. IRRI also maintains solid working relationships with other international crop research institutes belonging to the Consultative Group on Agricultural Research (CGIAR) and has agreed to deliver their solutions to Cambodia in a seamless manner.

99. Currently, Cambodia and IRRI are conducting joint research projects on climate change adaptation and mitigation, climate-resilient rice varieties, remote sensing-based crop monitoring, improvement of farmers' livelihoods, and postharvest technology. Many Cambodian researchers are also benefiting from IRRI's training and capacity-building activities. Some achievements of IRRI in relation to the development of climate resilient varieties are listed below:

100. Flood tolerance: The erratic floods experienced in rainfed and flood-affected areas are usually caused by heavy rainfall, overflow of nearby rivers and canals or sometimes tidal movements as in coastal areas. These floods cause serious problems for rice and other crops because of the poor or non-existent drainage and, in some cases, the topography of the land prevents fast water movement to drain flooded fields. Through conventional breeding, IRRI developed a rice variety that can withstand being submerged under water for two weeks. After the gene (called SUB1 gene) was found, it was infused into popularly grown rice varieties in rice-growing countries in Asia. Scuba rice is spreading fast in several countries over the last few years and are currently grown by more than 5 million farmers in Asia.

101. Drought tolerance: Drought is the most widespread and damaging of all environmental stresses, affecting 23 million hectares of rainfed rice in South and Southeast Asia. IRRI scientists have identified several key regions of the rice genome that give the rice drought tolerance and improve rice grain yield under drought. IRRI is working towards introducing drought tolerance into popular high-yielding rice varieties. By using drought-tolerant rice, farmers can enjoy 0.8-1.2 tons per hectare yield advantage than non-drought-tolerant varieties. This yield advantage will make the drought prone areas of target provinces in Cambodia to be much more productive, contributing to food security in poor rural communities.

102. Some achievements of IRRI on climate smart agriculture techniques are listed below:

- (i) Climate smart water management: IRRI has developed the alternate wetting and drying technology (AWD) or intermittent irrigation of the rice field as an effective water-saving measure. It reduces water consumption in paddy rice by 30% and consequently, reduces the cost of pumping water. Additionally, AWD helps mitigate emissions of methane—a greenhouse gas—in rice production by 50%.
- (ii) Laser leveling: In 1998, IRRI piloted laser-assisted land leveling in Cambodia under CIAP. By year 2000, around 200 fields had been leveled to demonstrate the technology. In 2012, the ADB-funded IRRI postharvest project reintroduced the technology and, to date, eight units are in use around the country.
- (iii) Nutrient management: Fertilizer often represents the highest input cost for farmers after labor, accounting for about 20% of the total cost of production. Soil nutrient knowledge can guide the development of practical tools to help farmers increase rice production and reduce costs through smart nutrient management. Importantly, the work shows that when fertilizer is used appropriately, yield can boost without negative impact on soil health.
- (iv) Pest management: Through a collaborative research network with national scientists in Asia, IRRI and ADB initiated the Rice Planthopper Project. It promotes ecological engineering as a management strategy to build ecological diversity which strengthens the rice field's natural capacity to cope with pests.
- (v) Postharvest management: From 2005 to 2008, IRRI and MAFF pilot tested postharvest technologies such as airtight storage systems; improvements in farmer granaries and grain quality assessment kits; and methods for improving rice mills and providing rice market information in 8 villages in Battambang and Prey Veng. IRRI also helped introduce combine harvesters and flatbed dryers in Cambodia. In 2009-2013, ADB funded the pilot testing and out scaling of these technologies in six provinces. By the end of 2013, about 200 flatbed dryers have been installed by the private sector, about 5,000 combine harvesters were in use, and the supply chain for airtight storage systems has been established. Recommendations developed by the ADB-supported project have been included in the Cambodia Rice Strategy.

103. In view of the wide-ranging achievements in development of climate resilient varieties and dissemination of climate smart agricultural practices and technologies to various countries, and in recognition of outstanding contributions to the Cambodian research institutions, IRRI is ideally placed to provide its services under this package in a comprehensive manner. The estimated budget is below.

A. Identification, testing, multiplication and demonstration of climate resilient varieties of rice, maize, cassava and mango	\$900,000
A.1. Flood tolerant varieties	200,000
A.2. Drought tolerant varieties	200,000
A.3. Varieties suitable for alternate wetting and drying	150,000
A.4. Varieties suitable for direct seeding	150,000
A.5. On-farm demonstrations (Farmer field schools, etc.)	200,000

B. Capacity strengthening climate smart agriculture focusing on rice, maize, cassava and mango	\$900,000
B.1. Climate smart water management practices	200,000
B.2. Laser land levelling demonstrations	200,000
B.3. Nutrient management for reducing GHG emissions	150,000
B.4. Integrated pest management	150,000
B.5. On-farm demonstrations	200,000
C. Personnel requirements	\$1,000,000
C.1. International specialists (30 person-months)	450,000
C.2. National Specialists (220 person-months)	550,000

D. Package CS4: Information Communication Technology Platform

104. **General scope of work.** Information and Communication Technology (ICT) based solutions will be piloted in the Kampong Cham province of Cambodia. The pilot will establish ICT platforms to support climate risk management components of the Agribusiness project based on a feasibility study completed during 2017. Among the pilots identified, the following were chosen for implementation.

Module 1: Information advisory systems such as market information systems and weather information services;

Module 2: Digital technologies for climate smart agriculture practices that support precision farming activities; and

Module 3: Information systems to monitor and manage climate risk management activities.

105. Module 1 will provide information advisory services related to market information. It will use the existing market information system and improve the organization of contents, modes of dissemination, enable price simulation and forecasting capabilities. Targeted information and additional data points will be introduced to add value to Kampong Cham farmers, traders, rice mills, and animal feed manufacturers. Further, agrometeorological capabilities will be introduced to deliver weather forecast and early warning messages to the farmers in the province. Module 2 will develop model farms in the province. These farms will be enabled with Internet of Things (IoT) based capabilities that will collect information related to soil chemistry, and agriculture inputs. The data collected will be used to provide advisory information to farmers to improve farm productivity. Module 3 will introduce systemic platforms to capture climate risk management services such as emergency aid disbursement activities and integrate digital payment methods.

106. The ICT components involve software development, ICT infrastructure (hardware) and communication services, policy and data exchange standards development, training and support services, and equipment. The project will be implemented through engaging system integrators and using service-oriented architecture such as cloud technology solutions. A firm will be used for developing detailed functional and technical requirements, developing equipment specifications, selecting the system integrators, and overseeing implementation.

107. The ICT infrastructure services includes establishing provincial agriculture cloud data center, portable information kiosks and mobile infrastructure. The software systems will include mobile applications, back-end systems. The use of systems will be strengthened by developing training programs and establishment of provincial agriculture information call center. To implement climate smart agribusiness practices, digital equipment such as drones, IoT Sensors enabled smart agriculture systems, and satellite imagery-based decision taking capabilities will be implemented. Further a process and facility to provide agriculture product quality testing and

information advisory services at field level will be piloted. To facilitate implementation of the provincial ICT platform, needed policies, data exchange standards, and cyber security protocols will be developed. Training modules, workshops and capacity building for use of ICT solutions will be incorporated to farmers and other stakeholders through provincial extension services network and agriculture cooperatives.

108. A total of 27 person-months of international and 48 person-months of national consultancy services are estimated to implement the project through identification and onboarding of system integrators. The system integrators will implement the modules and associated policy, training and change management activities.

109. **International Team Leader/ Project Manager** (6 person-months, intermittent): Will be responsible for overall team coordination, and delivery of quality and timely outputs. S/he will hold master's degree in engineering or, business or sciences. In the absence of master's degree, demonstrable experience of at least 15 years of IT project management in agribusiness domain is required. Additional qualifications such as project management professional certification (PMP) is preferred with adequate experience (at least 10 years) in the design of agribusiness management systems, agrometeorology techniques and use of Internet of things (IoT) techniques. The tasks to undertake will be:

- (i) Be responsible for overall direction of the consultant team, and coordination and management of inputs. The Team leader is overall focal for the firm throughout the implementation period;
- (ii) Manage the team relationships with government, the system integrator, through ADB point of contact;
- (iii) Identify tasks on the critical path, and ensure that implementation schedules are followed;
- (iv) Ensure quality of the deliverables and review / update plans;
- (v) Responsible for development and evaluation of request for proposals (RFP) process for selecting and onboarding of system integrators;
- (vi) Responsible for overall tracking of the project progress and data collection;
- (vii) In charge of development of maintenance and operations of the pilots and institution of appropriate management tools and techniques; and
- (viii) Take the lead in the preparation of the initial work plan and personnel schedule (including determining resource needs), monthly reports, feasibility study reports and technical sections of the tender documents.

110. **National Coordinator / Deputy Team Leader** (18 person-months, intermittent): Qualified project management expert with adequate experience (at least five years) in coordinating multiple stakeholders such as Government agencies, civil society groups and private sector entities. S/he should be highly proficient in MS Excel and knowledge and experience in computerization programs in government sector is preferable. The coordinator possesses good understanding of the provinces of Cambodia. S/he will:

- (i) Review plans of the pilots in the context of implementation possibilities of the projects given the ground realities in the provinces;
- (ii) Assist the team leader in the undertaking activities that aids project preparation and implementation;
- (iii) Supports the other experts in obtaining necessary information from local authorities, and public stakeholders of the province;

- (iv) Support drafting procurement documents and undertakes canvassing of solutions in the local market; and
- (v) Provide inputs to reports as required.

111. International Solution Architect (3 person-months, intermittent). With qualified post graduate degree holder (preferably IT engineering) and over 10 years' experience in the design of e-agriculture systems and solutions. The solution architect should have experience in ICT infrastructure sizing and network engineering. S/he will be responsible to:

- (i) Prepare detail architectural specifications related to IT components and networks;
- (ii) Assist in preparation of tender documents and evaluation of responses;
- (iii) Assist in selection and onboarding of system integrators and cloud service providers;
- (iv) Develop comprehensive IT blueprint for the pilots;
- (v) Develop troubleshooting manuals for the ICT infrastructure components;
- (vi) Provide technical advisory support to the system integrators and review system requirement specifications (SRS) and system design specifications (SDS);
- (vii) Undertake field visits and monitor progress of implementation; and
- (viii) Provide third party audit support, when needed.

112. International e-Agriculture expert (6 person-months, intermittent) **and National e-Agriculture expert**, (18 person-months, intermittent): The experts will have a relevant educational background with at least ten years' experience in government, international agencies and private sector works in the field of information technology applied in agriculture, forestry, and natural resources. S/he should have experience in designing and delivering agriculture ICT systems in Southeast Asia. The expert should have experience in design and implementation of e-commerce solutions. The national expert is expected to have a relevant education background with at least 5 years of experience in agriculture sector. The national expert will assist the international expert. The experts will report to the team leader and will be responsible for:

- (i) Support the administration of day to day activities of implementation of pilot projects;
- (ii) Act as single point of contact for all project escalations during the implementation;
- (iii) Define requirements and set scope for agriculture information systems and solutions;
- (iv) Develop supporting infrastructure and business process required for maintaining projects. The support process includes establishment of services such as call centers for farmers and kiosks operation;
- (v) Provide inputs to RFP for the ICT agriculture system components;
- (vi) Manage the entire bid process for system integrator onboarding;
- (vii) Draft the service level agreements and monitor its compliance by the system integrators;
- (viii) Develop policy, standards and capacity requirement needs for implementing the pilot and liaise with government in effecting the needed reforms;
- (ix) Develop and implement appropriate business models and business processes;
- (x) Ensure project financials are in line with the budget;
- (xi) Develop management information system and associated analytical components;
- (xii) Undertake and support development of function specifications and design of the solutions; and
- (xiii) Establish needed consultative mechanism for implementing the solution.

113. International Climate Smart Agriculture Expert (6 person-months, intermittent) **and National Climate Smart Agriculture Expert** (12 person-months intermittent): Should have a relevant educational background (preferably in electronics, instrumentation and IT) with at least two years' experience in IoT system implementation. The expert should have experience in implementing solutions using IoT techniques, geospatial technologies like GIS, and GPS, and sensor systems such as radio frequency identification techniques. Shall have experience with use of software to develop and or analyze maps or remote sensing images to compare physical topography with data on soil fertility, pest, weather among others. The national expert is expected to have a relevant education background with at least 3 years of experience in automation in agriculture sector. The national expert will assist the international expert. S/he will report to the e-Agriculture expert, and will be responsible for:

- (i) Undertake defining scope and requirement for applying geospatial techniques such as GIS, GPS and satellite imageries applicable to the context of the project;
- (ii) Undertake design of climate smart farming systems in the selected model farms by applying techniques such as pest scouting, site specific pesticide management applications, variable rate irrigation software systems and yield mapping;
- (iii) Design customization needed for the software system to analyze automated information obtained through IoT techniques, remote sensing and other related information systems;
- (iv) Contribute to the RFP by way of providing technical and function specifications input and assist in evaluation and onboarding of system integrators;
- (v) Guide the national coordinator in scanning the local market to assess availability of goods and services needed for precision farming and procure them following ADB processes;
- (vi) Develop and implement appropriate business models and business processes to maintain the application suite; and
- (vii) Develop and conduct training to the end-users and other stakeholders participating in the project.

114. International Climate Risk Management IT Specialist (6 person-months, intermittent): The specialist will have a relevant educational background (preferably in finance with IT) with adequate experience in designing automated solutions for emergency and disaster management activities. S/he will report to the team leader and will:

- (i) Undertake requirement gathering for emergency assistance management activities applicable to the context;
- (ii) Scan the market and evaluate applicability of the off-the-shelf products;
- (iii) Design the system specifications and associated business processes;
- (iv) Contribute to the RFP by way of providing technical and function specifications input and assist in evaluation and onboarding of system integrators; and
- (v) Develop training manuals, and act as a technical advisor to the system integrator; and
- (vi) Oversee implementation of the solutions and processes and guide implementation of the pilot solution.

E. Package CS5: Feasibility Studies and Detailed Engineering Design Consulting Firm (FSDD)

- a. Feasibility Studies and Detailed Engineering Design for Irrigation
- b. Feasibility Studies and Detailed Engineering Design for Rural Roads

115. **Scope of work.** The consultancy firm for the feasibility studies and detailed engineering design (FSDD) will assist the project management unit (PMU), and the provincial project implementation units (PPIU) in the preparation of feasibility study and detailed engineering design of each subprojects. The project implementation consultants (PIC-CS1) will review FSDD in coordination with MOWRAM / MRD prior to submission to ADB.

116. To ensure that the subprojects are designed in a logical and efficient manner, these will be grouped and packaged. The FSDD firm will start feasibility study and design work on a package by package basis and will allocate resources as required for these to be completed. Given the time needed to undertake feasibility studies and detailed engineering design for each package, as well as preparing tender documents (approximately six months), packages will likely have to be undertaken one after the other. However, there may be some overlap depending on the speed and resources of the FSDD firm. It is recommended that grouping of packages will be done based on location (with subprojects grouped according to province to the extent possible), as well as total estimated works contract size. Viable subprojects will then be approved by the Project Steering Committee (PSC) after submission and following recommendations from PMU. Prioritizing of the subprojects within each province should be agreed upon in consultation with PPIU and local authorities.

I. FOR IRRIGATION SUBPROJECTS

117. Activities shall include, but not be limited to the following:

Step 1. Reconnaissance and feasibility. The contractor needs to determine that the subproject is technically, environmentally, socially and economically feasible:

- (i) Detailed field surveys and analysis will be undertaken to determine that the sub-project: (a) is pro-poor (i.e. benefits will mainly accrue to poor farming households); (b) for irrigation projects, there is demonstrated water availability in sufficient quantity and quality to ensure the intended benefits of the project can be achieved; (c) works are technically feasible; (d) has demonstrated commitment from local government authorities; (e) has commitment from cooperatives and or water users to operate and maintain structures post project and to distribute water and resources in an equitable manner; and (f) is economically feasible (EIRR >12%). For estimation of EIRR, farm budgets will need to be estimated. The methodology used during project preparation for the representative subproject can be used.
- (ii) Hold meetings and discussions with community groups, commune leaders and potential cooperatives and water users, to understand the issues and expectation of local people.
- (iii) Socioeconomic data will be collected on each subproject site. If required, land acquisition and resettlement plans (LARPs), initial environmental examination (IEEs) and environment management plans (EMP) will be prepared. These should follow the project's land acquisition and resettlement framework (LARF) and

environment assessment and review framework (EARF). Due diligence report (DDR) and IEE for the representative subprojects were prepared in PPTA stage and can be followed. Due regard will also be given to the Summary Poverty Reduction and Social Strategy (SPRSS).

- (iv) Submit documents to PIC.

Step 2. Topographic survey. Involve PMU and PPIU staff in the surveys for on the job capacity building:

- (i) Using well qualified and experience surveying staff and professional survey equipment conduct detailed topographic survey for the full length of the irrigation. It is recommended that the FSDD uses its own staff or subcontracts a national private firm. The same is true when additional data are required.
- (ii) Undertake hydrological surveys if secondary data does not exist.
- (iii) Prepare the survey drawings and maps in CAD format.

Step 3. Detailed engineering design.

- (i) Consult PPIUs, local district officials, communes, existing or potential cooperatives and water users;
- (ii) Take due account of projected climate change impacts and incorporate design features that enhance resilience;
- (iii) Existing design procedures practice under national standards will be used. However, where innovative climate resilient improvements can be used, FSDD consultants will incorporate such innovations in the design providing sufficient justification for such additional costs, structures or practices can be proven.
- (iv) Update LARP, DDR, IEE, EMP and environmental code of conduct as necessary upon finalization of design.
- (v) Submit to PIC for review with relevant line agencies to ensure compliance with standards and regulations of the government.
- (vi) Submit to PMU for approval

Step 4. Tendering document.

- (i) Following approval of PMU of the detailed engineering design, FSDD will assist the national technical department of MOWRAM in PMU in the preparation of the tender documents and contracts for the construction of the subproject following international competitive bidding or national competitive bidding depending on the estimated value of the package.
- (ii) Tender documents should follow standard formats prepared during project preparation, unless modifications are required by PMU.
- (iii) Submit documents to PIC.

II. FOR FARM AND MARKET ROADS SUBPROJECTS

118. **Scope of work.** Activities required will include a detailed topographic survey of the full length of the road and preparation of a complete set of road design drawings with required supporting documents, calculations and specifications.

119. Design of the road and structures should conform to the Commune/Sangkat Fund Technical Manual (2009), Volume II: Specification for Construction Materials and Works and any other relevant guidelines and specifications. ADB's safeguards on environmental impact, land acquisition and DRR must be considered. Also, the practicalities of public access and safety must be considered. Activities shall include, but not be limited to the following:

Step 1. Reconnaissance and feasibility

- (i) Undertake a reconnaissance visit to the proposed road to investigate the existing condition of the road and structures, its history, present maintenance arrangements and funding.
- (ii) Hold meetings and discussions with community groups and commune leaders in order to understand the issues and expectations of local people.
- (iii) Carry out traffic count surveys and estimate the type and quantities of goods that may be exported along the road once it has been rehabilitated (e.g., agricultural produce based on the cropped area served by the road).
- (iv) Investigate the local geology and soils and possible sources of construction materials (local quarry site, borrow pit area, etc.).
- (v) Consider and collect information on issues such as flooding, traffic, resettlement needs, environmental concerns, and particular problems such as use by heavy vehicles.
- (vi) Submit documents to PIC for endorsement to PMU, PSC and ADB.

Step 2. Topographic survey. Following clearance of Step 1 documents by PSC:

- (i) Prior to carrying out the topographical surveys, establish permanent control points for both horizontal and vertical control along the full length of the road.
- (ii) Using well qualified and experienced surveying staff and professional survey equipment, conduct a detailed topographic survey for the full length of the road. All topographical details such as existing roads, tracks, drainage structures, buildings, walls, existing road furniture and services/utilities (electric, telephone and water lines) shall be surveyed. At the location of bridges and other structures a wider area shall be surveyed, and the position of all features will be recorded.
- (iii) Prepare the survey drawings and maps in CAD format.
- (iv) Where necessary, site specific geotechnical information for the design and construction of the road and structures will be collected through appropriate field and laboratory investigations and supporting calculations.

Step 3. Detailed Engineering Design

- (i) Analyze the information collected and, consider alternative designs to overcome the issues for each road section before deciding on the best solution (low cost with a good quality laterite surface and higher cost with alternative road surfaces - different sections of the road may have different surfaces depending on the likelihood of floods, potential daily traffic and reducing dust through villages).
- (ii) For sections of the road that flood, prepare designs for raised embankments to take the road surface above flood levels four years out of five years.
- (iii) Consider the need for and dimensions of bridges, concrete causeways and culverts to allow floods to pass.
- (iv) Identify sources of suitable materials for road construction and their costs.

- (v) Prepare the detailed engineering designs, drawings and costs of the road and road structures. The engineering design should provide the following details:
 - a. Earthworks - cut and fill;
 - b. Drainage – side ditches, and pipe and box culverts;
 - c. Bridges – structural calculations for the substructure (foundations and abutments) and superstructure;
 - d. Pavement – surface, wearing course, base course, sub-base and shoulders;
 - e. Road safety facilities – road signs, road markings, speed bumps outside schools, etc. The design drawings accompanied by supporting documents and calculations, should include longitudinal sections and cross sections of proposed road and structures, indicating the high flood marks. Standard road surface width will be 5.0meters, but it may be necessary or desirable to reduce the widths of some road sections and provide passing places.
- (vi) Submit all reports and drawings (three hard copies and one soft copy) to PIC for provincial level approval. The soft copies will include the CAD files and pdf versions to enable access by staff who do not have the CAD programs. The PIC will forward copies to the PMU and ADB.

Step 4. Tendering of subproject construction

- (i) Following approval of the documents by PSC and ADB, the FSDD consultants will assist preparation of the tender documents and contracts for construction of the subproject.

120. **Team Leader/Irrigation Design Engineer** (international, 20 person-months). Will be responsible for overall team coordination, and delivery of quality and timely outputs. S/he will be a qualified engineer (preferably civil engineer) with adequate experience (at least 10 years) in the design of irrigation rehabilitation and upgrading works, the tasks to undertake will be:

- (i) Be responsible for overall direction of the consultant team, and coordination and management of inputs;
- (ii) Manage the FSDD team relationships with the government, PIC, ADB and other stakeholders;
- (iii) Identify tasks on the critical path, and ensure that implementation schedules are followed;
- (iv) Take the lead in the feasibility and detailed design of structures, and outsource specific studies as required (e.g. topographic studies); and
- (v) Take the lead in the preparation of the initial work plan and personnel schedule (including determining resource needs), monthly reports, feasibility study reports and technical sections of the tender documents.

121. **Deputy Team Leader/Irrigation Design Engineer** (national, 20 person-months) The deputy team leader/irrigation design engineer will be a qualified engineer (preferably civil engineer) with adequate experience (at least five years) in the detailed design of irrigation rehabilitation and upgrading works. S/he should be highly proficient in MS Excel and knowledge and experience in using AutoCAD is preferable. S/he will:

- (i) Prepare plans of the subprojects, showing where selected hydraulic structures are located, including reservoirs, main canals and the positioning of secondary and tertiary canals. The latter may require ground truthing using GPS.
- (ii) Assist the team leader in the feasibility and detailed design of structures (including the preparation of drawings and bill of quantities), including the supervision of any engineering surveys (e.g. topographic surveys). Undertake field visits as required to gather data and be involved in public disclosure meetings (with the environmental and social safeguards teams).
- (iii) In collaboration with the Agricultural Economist / Agriculturalist, assist in the assessment of the crop water requirement for design and scheme water distribution purposes.
- (vi) In collaboration with the Hydrologist, assist in the preparation of the rating curves at canal headwork levels.
- (iv) Assist in the preparation of the Water Requirements and Availability annex at irrigation scheme level (main canal) of the feasibility reports, including a proposal of water distribution from the main irrigation canal to branching or secondary canals.
- (v) Provide inputs to reports as required.

122. **Road Design Engineer** (national, 20 person-months). Bachelor's degree or higher in road engineering, civil engineering or equivalent qualifications from a recognized institution. At least 5 years' experience in designing rural roads and road structures. Experience in alternative road surfaces would be an advantage. Knowledgeable in using CAD facilities in the preparation of designs and drawings. In coordination with MRD and PRD, s/he will report to the Team Leader and will be responsible for:

- (i) Assist in the identification, screening of subprojects.
- (ii) Undertake feasibility studies. Investigate existing road conditions and structures, its current maintenance arrangements and funding. Collect information on issues such as road traffic, flooding, resettlement needs and environmental concerns and be involved in public disclosure meetings with the social and safeguards teams.
- (iii) Supervise survey.
- (iv) Assist the team leader in the preparation of feasibility studies and detailed design of structures including the preparation of drawings and bill of quantities.
- (v) Ensure that designs are consistent with engineering standards and specifications for such works in Cambodia and incorporate measures to enhance climate change resilience and disaster risk reduction. Review the need for road safety measures and design road safety features appropriately.
- (vi) Ensures that resettlement and environmental issues are reviewed by relevant project staff, and if necessary, by the General Resettlement Department and that safeguard measures are incorporated.
- (vii) In coordination with the procurement specialist, assist the civil engineer from the national technical department of MRD in PMU and the provincial PRD staff, in preparing tender documents and construction contracts.
- (viii) Provide inputs to reports as required.

123. **AutoCAD Specialists** (national, 42 person-months, four individuals). The AutoCAD specialists will be qualified engineers (preferably civil engineers) with over 3 years' experience in the use of AutoCAD, and with experience in the design of rural infrastructure, irrigation rehabilitation and upgrading works, they will:

- (i) Prepare detailed design drawings using AutoCAD, based on detailed designs prepared by the irrigation engineers.
- (ii) Link the design drawings to the calculation of bill of quantities.

124. **Hydrologists** (international, 2 person-months) and (national, 4 person-months). The hydrologist will have a relevant educational background with at least ten years' experience in hydrology, including in rural infrastructure, irrigation rehabilitation and upgrading design. They should be highly proficient in MS Excel (including the use of pivot tables) and MS Access. They will report to the team leader and will be responsible for:

- (i) Assessing the watershed, ground water and or river hydrology in the area of the intake of selected schemes (using secondary or primary data); and
- (ii) Preparing the Water Requirements and Availability annex from the water sources into the irrigation schemes.

125. **Agricultural Economist** (international, 5 person-months). The agricultural economist will have a relevant educational background (preferably in economics) with at least ten years' experience in undertaking economic analysis of agricultural projects, preferably irrigation rehabilitation projects. Experience of undertaking EIRRs according to ADB or World Bank guidelines will be an advantage. S/he will report to the team leader and will be responsible for:

- (i) Preparing farm budgets (with and without project) for the subprojects. This will include organizing a farm survey to determine farm size, current cropping type and patterns, crop yields, cropping intensities, and cropped areas.
- (ii) Prepare EIRRs for the subprojects and write the economic and financial analysis annex and economic analysis section of the feasibility reports. This will require undertaking sensitivity analysis and determining subproject benefit distribution, poverty impact and household financial returns. The economic and financial analysis reports and Excel files prepared at PPTA stage can be used as templates.

126. **Agriculturalist** (national, 6 person-months). The agriculturalist will have a relevant educational background (preferably in irrigated agriculture or agronomy) with at least five years' experience in agricultural development. The expert should have experience in undertaking agricultural surveys. S/he will report to the international agricultural economist, and in his/her absence the team leader and will be responsible for:

- (i) Under the guidance of the agricultural economist, undertake farm surveys to collect necessary information for the agricultural economist to prepare farm budgets (with and without project) for the subprojects. This will include collecting information to determine farm size, current cropping type and patterns, crop yields, cropping intensities, and cropped areas (preferably subdivided between head, middle and tail reaches).
- (ii) The potential to changing the cropping calendar on the basis of improved water availability and less impact damage to produce with rural road improvement should be determined.
- (iii) Collect market prices for agricultural products and for inputs, as required by the agricultural economist.

127. **Social Safeguards Specialist** (international, 2 person-months). The social safeguards specialist will have a relevant educational background (preferably in a social science) with adequate experience in resettlement, social development and gender safeguard procedures for donor organizations such as the ADB or World Bank. S/he will report to the team leader and will:

- (i) Organize socioeconomic surveys in the subproject areas in order to prepare the socioeconomic survey and analysis annex of the feasibility reports.
- (ii) Take the lead in organizing public disclosure meetings in order to present the project and determine stakeholder concerns and ensure that the engineering team are aware of these.
- (iii) Once sites for structures have been identified, undertake an involuntary resettlement screening to determine if there are any resettlement impacts (see template in the Land Acquisition and Resettlement Framework (LARF)).
- (iv) If there are impacts, then organize a census of affected households and determine any impact.
- (v) Prepare a land acquisition and resettlement plan (LARP) (if Cat B) including a public disclosure plan as an annex, and details on mitigation measures. The LARPs produced in the PPTA stage can be used as templates, and procedures outlined in the LARF should be followed.
- (vi) Once finalized and approved, assist the PMU to ensure that details of the LARP are disclosed to affected households and that the public disclosure plan is disseminated as required.

129. **Social Development and Gender Safeguard Specialist** (national, 4 person-months). The specialist will have a relevant educational background (preferably in a social science) with adequate experience in carrying out gender and social surveys. S/he will work with the international social safeguards specialist and will:

- (i) undertake socioeconomic surveys in the subproject areas in order to prepare the socio-economic survey and analysis annex of the feasibility reports; and
- (ii) undertake public disclosure meetings to present the project and determine stakeholder concerns – and ensure that the engineering team is aware of such concerns.

130. **Resettlement Specialist** (national, 6 person-months). The resettlement specialist will have a relevant educational background (preferably in a social science) with adequate experience in carrying out resettlement surveys, for ADB or World Bank. S/he will work closely with the international social safeguards specialist and will:

- (i) Undertake public disclosure meetings in order to present the project and determine stakeholder concerns – and ensure that the engineering team is aware of such concerns;
- (ii) Once sites for structures have been identified, assist the social safeguards specialist (with field visits if necessary) to undertake an involuntary resettlement screening to determine if there are any resettlement impacts (see template in the LARF);
- (iii) If there are impacts then, with the international social safeguards specialist, undertake a census of affected households and determine any impact;
- (iv) Assist the international social safeguards specialist in the preparation of the due diligence report (DDR), land acquisition and resettlement plan (LARP) as required; and

- (v) Once finalized and approved, assist the PMU to ensure that details of the DDR or LARP are disclosed to affected households and that the public disclosure plan is disseminated as required. This may require field visits to disclose details.

131. **Environmental Safeguards Specialists** (international, 2 person-months) (national, 10 person-months). The environmental safeguards specialists will have a relevant educational background with adequate experience in environmental safeguard procedures for donor organizations such as the ADB or World Bank. They will report to the team leader and will:

- (i) With the social safeguards team, jointly organize consultation meetings to present the project and determine stakeholder concerns – and ensure that the engineering team is aware of such concerns;
- (ii) Once sites for structures have been identified, undertake an environmental screening to determine if there are any environmental impacts, and thus determine the environmental category (see template in the Environmental Assessment and Review Framework (EARF));
- (iii) If the subproject is classified as category B (potential adverse environmental impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects) then prepare an initial environmental examination (IEE), including an environmental management plan (EMP). The procedures set-out in the EARF should be followed, and the IEE prepared during project preparation stage can be used as a template; and
- (iv) If the subproject is classed as category C (a proposed project is likely to have minimal or no adverse environmental impacts) then review environmental implication and provide a write up for insertion in the feasibility study report.

132. **Procurement Specialist** (national, 4 person-months). The procurement specialist will have a relevant educational background with adequate experience in ADB procurement procedures, including the preparation of civil works tender documents. S/he will report to the team leader and will be responsible for:

- (i) The preparation of tender documents for civil works contracts for the subprojects in accordance with ADB guidelines taking into account the national procurement guidelines. A master bidding document prepared for the project should be used as a model;
- (ii) Prepare the subproject procurement section of the feasibility reports; and
- (iii) Coordinate with the procurement specialists/officers in PIC and in PMU.

133. **Deliverables.** For each package the following reports will be prepared:

- A work plan and personnel schedule should be submitted no later than two weeks after mobilization.
- Short monthly reports (no more than 1 page per sub-project in a format to be agreed with the PMU).
- A draft feasibility report (for each subproject) should be submitted no later than three months after mobilization. See Annex 7 for a draft contents list. IEE, if required, should be translated into Khmer, as should the public disclosure plan (an annex to the LARP).
- Tender documents for work packages (including detailed engineering design drawings) should be submitted no later than six months after mobilization.

134. The reports will be submitted in electronic copy and hard copy (three copies) to the PMU Project Manager. The reports must be written in English. The PMU will provide comments to the reports within 30 days. The reports should then be updated by the FSDD firm. In the absence of comments or approval within the set deadline, the reports are deemed to be approved.

PROJECT PERFORMANCE MONITORING SYSTEM

1. This document presents the project performance monitoring system (PPMS) for the Cambodia: Climate-friendly Agribusiness Value Chain Sector funded by the Asian Development Bank (ADB) and the Government of Cambodia. The PPMS is developed for monitoring the indicators and targets for outcome and outputs outlined in the project design and monitoring framework (DMF) and against those targets and indicators in the Gender Action Plan, social development and safeguards and those covenants as detailed in the loan agreement.

2. **Output 1: Critical agribusiness value chain infrastructure improved and made climate resilient.** This output addresses infrastructure gaps to enhance competitiveness of the value chains of rice, maize, cassava and mango in target provinces. It involves rehabilitation and modernization of rural infrastructure to increase production and resource efficiency, reduce post-harvest losses, and enhance quality and value chain links while reducing GHG emissions and increasing climate resilience. Key activities include: (i) rehabilitating irrigation and water management infrastructure (off-farm irrigation systems, on-farm rainwater harvesting ponds, and drip irrigation) to climate resilient condition; (ii) upgrading agricultural cooperative value chain infrastructure (drying, processing and storage facilities); (iii) improving connectivity of farms to cooperatives and markets through climate resilient farm road networks; (iv) strengthening infrastructure for agricultural quality and safety testing at the National Agricultural Laboratory; and (v) promoting renewable energy (biogas and use of solar energy in target cooperative areas) for value chain improvement.

3. The project will rehabilitate water management infrastructure through de-silting works and upgrading design standards to withstand climate variability and projected climate changes and install drip irrigation systems to improve yields and deliver exportable mango fruit. The project will support construction of climate-proofed post-harvest units for cleaning, drying and storage at farm cooperatives. It will improve climate resilience of farm to market roads through measures such as increasing height of embankments, promoting cross drainage and selecting permeable materials.

4. **Output 2: Climate smart agriculture and agribusiness promoted.** Key activities under this output include (i) deploying climate resilient varieties; (ii) strengthening capacity in climate friendly production practices and technologies; and (iii) promoting farm mechanization and extension. The project will support the Cambodian Agricultural Research and Development Institute to produce, multiply and distribute climate resilient varieties of rice and maize and to improve weaning and acclimatization of mango and cassava germplasm. The project will train at least 40,000 farmers (16,000 women) on climate smart agriculture practices. It will demonstrate laser land levelling to improve water use efficiency and enhance capacity of farmer water user groups to operate and manage irrigation schemes. The project will construct and upgrade four farm mechanization workshops and four agribusiness training facilities to train farmer water user communities, women farmer networks and agricultural cooperatives in operation and maintenance of infrastructure and farm machinery.

5. **Output 3: Enabling environment for climate friendly agribusiness enhanced.** The project will assist the Ministry of Agriculture, Forestry and Fisheries (MAFF) and the Ministry of Commerce in creating an appropriate enabling policy environment for agribusinesses. Key activities include: (i) formulating climate friendly agribusiness policies and standards; (ii) promoting green finance and risk sharing mechanisms; and (iii) supporting climate risk management through information and communication technologies. The project will provide support for agricultural product certification, quality and resilience standards, including Cambodia Good Agricultural Practice (CAMGAP) and organic fertilizer standards. The project will support

cooperatives in becoming sustainable agribusiness ventures by linking up with the private sector and by establishing crop-centric public private partnership forums for each commodity value chain. The project will raise financial institutions' awareness on green finance and integration of environmental and climate risk screening criteria into credit application and reporting procedures. Using information and communication technologies, the project will provide weather, market and agronomic information with a view to create an enabling environment for more effective climate risk management.

6. **Project Area of Influence.** In line with the principle of promoting regional cooperation, integration, and trade, the proposed project will focus on strengthening agribusiness value chains in Kampong Cham and Tboung Khmum provinces along the GMS southern economic corridor and Kampot and Takeo provinces along the GMS southern coastal economic corridor.

7. **Project Costing.** The project cost is estimated at \$141.04 million. (i) ADB will provide \$90 million in loan (ii) \$40 million from GCF (\$10 million loan and \$30 million grant), (iii) \$ 3.66 million from beneficiaries and (iv) \$7.38 million from the Government of Cambodia. Both (iii) and (iv) can be in cash or in-kind.

8. **Project Implementation Arrangements.** The national level coordination will be provided by a Project Steering Committee (PSC) which will be chaired by MAFF (Secretary of State), vice chaired by the Ministry of Economy and Finance (MEF) with representatives from MOWRAM, Ministry of Industry and Handicraft (MIH), Ministry of Rural Development (MRD), Ministry of Environment (MOE) and Ministry of Commerce (MOC). In order that decisions are made quickly, it is recommended that the various steering committee members will be at least the rank of Director General.

9. MAFF will be the executing agency (EA) and will be responsible for overall project management, coordination and reporting and will host the PMU. The PMU will have the responsibility for the day to day management, coordination and supervision of the project, as well as consultant recruitment, financing and fund flow, and the oversight of safeguard issues and measures. The PMU organization will house the project implementation consultants (PIC) and will have a full-time project manager and staff with responsibilities for finance, procurement, safeguards and monitoring and evaluation.

10. Specific MAFF implementation departments will include those within the General Directorate of Agriculture (GDA): National Agricultural Laboratory, Department of Agricultural Engineering (DAEng), and Department of Agricultural Cooperative Promotion (DACP). The General Directorate of Animal Health and Production (GDAHP) will have a role at central level. Support from GDA departments such as the Department of Rice, Department of Industrial Crops and Department of Agroindustry will also be critical. All these departments will serve as resource providers to the provincial activities, primarily within the remit of PDAFF sub-output responsibilities.

11. Although MAFF is the EA for the project, land acquisition and resettlement is mandated to the Inter-Ministerial Resettlement Committee/General Department of Resettlement (IRC/GDR) except for the preparation of LARF during the feasibility study. IRC has the mandate to review and evaluate the resettlement impact and land acquisition for public physical infrastructure development projects in the Kingdom of Cambodia. IRC is a collective entity, permanently chaired and led by MEF, with members from different line ministries. IRC will carry out its roles through a Working Group (IRC-WG) which will be established by MEF for this project. IRC is the approving authority for all RFs, RPs and DRPs prior to submission to the ADB for its approval. The General

Department of Resettlement (GDR) is the permanent Secretariat of the IRC and the General Department of the MEF and is the lead agency for the preparation, implementation, monitoring and reporting of land acquisition and resettlement. GDR will be responsible for all land acquisition and resettlement activities, including grievance redress mechanism (maintenance of the Grievance Database, update and reporting) and preparing LARP Compliance report upon completing compensation payment/RP implementation for this project.

12. The IRC-WG will carry out the day to day land acquisition and resettlement activities under the project and led by the Deputy Director/Chief of the GDR and comprise of technical staff from PMU, GDR, the Ministry of Land Management, Urban Planning and Construction. The IRC-WG will be responsible for all the field work under the supervision of the Director of the GDR and overall guidance and direction of the Director General of the GDR

13. CARDI and IRRI will be responsible for the climate resilient variety development activities, but field demonstrations and trials will include full coordination with the PDAFF.

14. MOWRAM and MRD will be represented in PMU which will be staffed by project director, civil or irrigation engineers, financial officer, procurement officer and administrative officer, that can provide and coordinate national technical department (NTD) as well as financial and procurement activities and have a central level coordinating role. The PMU will provide the necessary technical expertise relevant to that ministry's activities within the scope of the project.

15. A PPP Inter-Ministerial Committee (IMC) will be formed and chaired by MEF and will have a maximum ten representatives purely to review potential PPP agribusiness projects and will meet once every two months. The private sector related to the value chains will have an input through the business forums, federations and associations that will provide feedback and information to the proposed PPP IMC and on to the steering committee. The forums, federations and associations can circumvent the IMC for non-PPP initiatives.

16. The climate smart agribusiness policy activity will be led by the working group that comprises representatives from the MAFF, MEF, MOC, MIH and MOE. As MEF is the EA of the ADB Rice Commercialization project which has sponsored a feasibility study on how best to approach and implement crop insurance activities, MEF will provide assistance to the crop insurance initiative and green financing. MEF is also working on and being supported by ADB on PPP initiatives.

17. Provincial technical support will be provided by the provincial project implementation units (PPIU) in each of the four provinces. The PPIU will be led by PDAFF Director and will be supported by the Deputy Directors of PDWRAM and PDRD, as well as officers in PDAFF related to Cooperative support and Provincial Agricultural Extension and GDAHP being responsible for all activities related to biodigesters and bio-slurry activities. Administration support and drivers will also complement the PPIU.

Table A3.1: Implementation Progress Startup Activities Table

Activity	Deadline	Status
Open advance account & subaccounts		
PIC recruitment		
Advanced implementation award of subproject contracts		
Advanced procurement of goods		

A. KEY ACTIVITIES AND MILESTONES

18. Output 1: Critical agribusiness value chain infrastructure improved and made climate resilient.

- (i) Construct representative subproject for irrigation and confirm implementation plans for rehabilitating and/or developing critical infrastructure for priority value chains (Q1–Q4 2019);
- (ii) Confirm land availability, locations, suitability, and connectivity for siting processing, storage, marketing and logistics infrastructure (Q1 2019 –Q4 2020);
- (iii) Undertake detailed engineering design, tender and construct critical production and post-harvest infrastructure to climate-resilient condition (Q2 2019–Q3 2024); and
- (iv) Establish management systems for operation and maintenance of infrastructure (Q1 2022–Q3 2023).

19. Output 2: Climate smart agriculture and agribusiness promoted.

- (i) Deploy climate resilient varieties of rice and maize (Q2 2019–Q2 2024);
- (ii) Conduct training for farmers, SMEs and private sector on CSA, (Q2 2019–Q2 2024); and
- (iii) Establish or upgrade mechanical workshops and training facilities (Q3 2019–Q2 2024).

20. Output 3: Enabling environment for climate smart agri-business enhanced.

- (i) Assist in formulating climate smart agribusiness support including policy and regulations, and advice on agronomy, markets, and links between farmers and the private sector (Q2 2019–Q4 2022);
- (ii) Conduct training on climate risk management and green finance, including structuring of public private partnerships in agribusiness (Q2 2019–Q1 2024); and
- (iii) Establish ICT platform for climate risk management (Q3 2020–Q2 2024).

a. Safeguards

Subproject/Contract	Social safeguard assessment	Social Safeguard screening	Resettlement Plan		Environment assessment	
			Completed	Ongoing	Completed	Ongoing
Subproject 1 – name	completed	Yes	Yes, no or NA		Yes or no	
Subproject 2 – name	completed	yes				
Subproject 3	Under review	In progress				
Subproject 4						

b. Procurement

21. A brief write-up and review of the 18-month procurement plan.

Procurement of Goods and Equipment

Package	Estimated Amount (\$)	Award Date	Contract Amount (\$)
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Package 1	Insert amount	Insert date	Insert amount
Package 2			
Package 3			

c. Works contract progress

Subproject/contract	Scheduled Completion	Time elapsed	Physical progress (%)
Contract one	Insert date	Months	Percent
Contract 2			
Contract 3			

d. Disbursements

Loan Category	Allocation (\$)	Amount disbursed	Percentage	Target
ADB	90 million	Insert amount		
Government of Cambodia	7.4 million			

e. Financial Progress

Item	Amount allocated (\$)	Amount committed (\$)	Paid (\$)
Goods			
Contract 1			
Contract 2			
Consulting Services			
Contract 1			
Contract 2			
Works			
Contract 1			
Contract 2			

B. PROJECT PERFORMANCE

22. The project's performance against the targets set out in the DMF for outcome, outputs and inputs is reported in the table below:

Table A3.2: DMF Targets vs. Achievements

Results Chain	Performance Indicators with Targets and Baselines	Achievements
Outcome Productive and resource efficient agribusiness value chains developed in project areas	By 2026 a. At least 15% increase in yields (2017 baseline: rice 2.7 tons, maize 4 tons, cassava 20 tons and mango 15 tons/ha). b. GHG emissions reduced by 240,000 tons of CO ₂ (2017 baseline: 0 tons reduced due to the project). c. At least 50 agribusinesses become more resource efficient in terms of water savings (5-10% efficiencies); energy savings (20%); and reduction in post-harvest losses (10%) (2017 baseline: 0).	
Outputs 1. Critical agribusiness	By 2024 1a. 27 irrigation and water management systems targeting 15,000 ha and 25,000 households (with at least 50,000	

Results Chain	Performance Indicators with Targets and Baselines	Achievements
value chain infrastructure improved and made climate resilient	<p>women) rehabilitated and made climate resilient (2017 baseline: 0).</p> <p>1b. 800 on-farm rainwater harvesting ponds commissioned (2017 baseline: 0).</p> <p>1c. At least 250 km of farm road networks upgraded to climate standards to improve connectivity of farms to cooperatives and markets (2017 baseline: 0).</p> <p>1d. 80 agricultural cooperatives integrated adaptation measures in post-harvest infrastructure investments (2017 baseline: 5).</p> <p>1e. Crop product quality and safety testing infrastructure in National Agricultural Laboratory upgraded to test 1500 samples (2017 baseline: 700) and generate service income of more than \$75,000 (2017 baseline: \$0).</p> <p>1f. 12,000 additional biodigesters and 6,000 compost huts made operational benefitting at least 80,000 persons, including at least 50% women beneficiaries, due to improved household air quality (2017 baseline: 11,468 persons, including 5,721 women).</p>	
2. Climate smart agriculture and agribusiness promoted	<p>2a. Three additional climate resilient varieties of rice and maize released (2017 baseline: 0).</p> <p>2b. 40,000 farmers (of whom 16,000 are women) trained in CSA and agribusiness development skills, of which 50% are SRP compliant with direct links to millers and exporters (2017 baseline for SRP compliance: 0).</p> <p>2c. 27 FWUCs/FWUGs made operational and 500 FWUC members (of which 30% women) developed capacity to operate and maintain their irrigation schemes (2017 baseline: 0).</p> <p>2d. 4 provincial agricultural development centers and 4 engineering workshops made fully operational to provide agribusiness services and strengthen farmer value chain linkages (2017 baseline: 0).</p>	

Results Chain	Performance Indicators with Targets and Baselines	Achievements
3. Enabling environment for climate friendly agribusiness enhanced	<p>3a. Climate-smart and gender-responsive agribusiness policy for target commodities, including a PPP framework focusing on agribusinesses formulated (2017 baseline: 0).</p> <p>3b. CAMGAP for tropical fruit and organic fertilizers endorsed as national standard for tropical fruit and organic fertilizers (2017 baseline: 0).</p> <p>3c. 50 staff, including 30% women, from financial institutions trained in CSA and green finance (2017 baseline: 0).</p> <p>3d. 30 agribusinesses, including 30% women-led and/or owned, trained on green finance and CSA (2017 baseline: 0).</p> <p>3e. 20,000 households, including 20,000 women, provided with information on climate risk sharing instruments (2017 baseline: 0).</p> <p>3f. ICT platform for climate friendly agribusiness established in Kampong Cham province (2017 baseline: 0).</p>	

22. Use the Annex 4 template in monitoring the project's progress in terms of gender action plan.

23. **Data Management.** The process of data management consists of data collection, data communication, analysis and reporting. Data will be collected on all the indicators defined in the DMF by PIC, PMU and the implementing agencies. It shall be reported to the M&E officer of the PMU which will be supported by the PMU Project Manager and the relevant PIC team members particularly those that relate to management, procurement and infrastructure/subproject implementation. This will include data on water management and irrigation infrastructure, cooperative agribusiness development and value chain linkages. Human resource development is important to record; the capacity of government officers to support the project, gender mainstreaming, the operation and management of cooperatives FWUCs and their training absorption capacity.

24. The PIC, PMU, MRD and PDWRAM will compile the information in respect of the individual subprojects carried out by the project and the PMU will collate the data after having ensured the necessary details and data are relevant to verify performance to evaluate the output of the activities. The PMU will subsequently update the PPMS with support of PIC.

25. Data on indicators related to off farm water management and FWUC capacity building will be the responsibility of MOWRAM; rural roads of MRD and on-farm irrigation and cooperative storage unit development of MAFF. All concerned ministries will monitor gender, social safeguards and development and the capacity building activities linked to the project activities. The PPIUs will play an important role in the collection of data during the subproject implementation process and capacity building activities

26. **Status of Compliance with Loan Covenants.** There are a number of loan covenants, out of which the PPMS will indicate and report the number where compliance has been achieved,

partly complied and are ongoing and are still not met or are not yet due. The list of covenants under relevant categories and their status of compliance as of a certain date are provided in the table below.

Status of Compliance with Loan Covenants

No:	Covenant	Loan Agreement Reference	Compliance status	Remarks
	Financial			
1				
2				
	Safeguards			
1				
2				
	Social Development			
1				
2				
	Economic			
1				
2				
	Others			
1				

27. **Problems and Issues during Implementation.** The final section of the PPMS report will describe any problems caused by delayed project implementation over the last 6 months. The list of actions taken, and the status of proposed actions are recorded.

28. **Reporting.** The PPMS will be updated every 6 months from the start to end of the project. It will be sent to ADB by 30 January and 30 July every year.

GENDER ACTION PLAN (GAP) MONITORING TABLE

Date of update:

Project Title:

Country:

Project No.:

Type of Project (Loan/Grant/TA):

Approval and Timeline:

Gender Category:

Mission Leader:

Project Impact:

Project Outcome:

Gender Action Plan (GAP Activities, Indicators and Targets, Timeframe and Responsibility)	Progress to date (as of _____) (This should include information on period of actual implementation, sex-disaggregated quantitative updated (e.g. number of participating women, women beneficiaries of services, etc.), and qualitative information. However, some would be on-going - so explain what has happened so far towards meeting the target.	Issues and Challenges (Please include reasons why an activity was not fully implemented, or if targets fall short, or reasons for delay, etc., and provide recommendations on ways to address issues and challenges)
Output 1: XXX		
1. Human capacity strengthening for female scholars: at least 10% of the total trainees (55 persons) will be women	Achieved: 13 out of 55 staff (24%) were appointed to study abroad for Masters, PhD or postdoctoral degrees	
2.		
3.		
Output 2:		
1.		
2.		
3.		
Output 3:		

Comments/ Remarks:

Accomplished by: _____

Date Accomplished: _____

PROGRESS REPORT OUTLINE

A. Introduction and Basic Data

1. Provide the following:

- ADB loan number, project title, borrower, executing agency(ies), implementing agency(ies);
- total estimated project cost and financing plan;
- status of project financing including availability of counterpart funds and cofinancing;
- dates of approval, signing, and effectiveness of ADB loan;
- original and revised (if applicable) ADB loan closing date and elapsed loan period based on original and revised (if applicable) loan closing dates; and
- date of last ADB review mission.

B. Utilization of Funds (ADB Loan, Cofinancing, and Counterpart Funds)

2. Provide the following:

- cumulative contract awards financed by the ADB loan, cofinancing, and counterpart funds (commitment of funds to date), and comparison with time-bound projections (targets);
- cumulative disbursements from the ADB loan, cofinancing, and counterpart funds (expenditure to date), and comparison with time-bound projections (targets); and
- re-estimated costs to completion, need for reallocation within ADB loan categories, and whether an overall project cost overrun is likely.

C. Project Purpose

3. Provide the following:

- status of project scope/implementation arrangements compared with those in the report and recommendation of the President (RRP), and whether major changes have occurred or will need to be made;
- an assessment of the likelihood that the immediate development objectives (project purpose) will be met in part or in full, and whether remedial measures are required based on the current project scope and implementation arrangements;
- an assessment of changes to the key assumptions and risks that affect attainment of the development objectives; and
- other project developments, including monitoring and reporting on environmental and social requirements that might adversely affect the project's viability or accomplishment of immediate objectives.














D. Implementation Progress

4. Provide the following:

- assessment of project implementation arrangements such as establishment, staffing, and funding of the PMO or PIU;
- information relating to other aspects of the EA's internal operations that may impact on the implementation arrangements or project progress;
- progress or achievements in implementation since the last progress report;

- assessment of the progress of each project component, such as,
- recruitment of consultants and their performance;
- procurement of goods and works (from preparation of detailed designs and bidding documents to contract awards); and
- the performance of suppliers, manufacturers, and contractors for goods and works contracts;
- assessment of progress in implementing the overall project to date in comparison with the original implementation schedule—quantifiable and monitorable target, (include simple charts such as bar or milestone to illustrate progress, a chart showing actual versus planned expenditure, S-curve graph showing the relationship between physical and financial performance, and actual progress in comparison with the original schedules and budgets, the reference framework or guidelines in calculating the project progress including examples are shown in Appendix 2); and
- an assessment of the validity of key assumptions and risks in achieving the quantifiable implementation targets.

Sample Implementation Schedule

Activities	Year 1	Year 2	Year 3	Year 4	(a) Assigned Weight	(b) Actual Progress	(a) x (b) Weighted Progress
Establish PIU					5%	100%	6%
Establish Accreditation Board, etc.					5%	0%	0%
Appoint Staff and Budget					4%	75%	3%
Adopt Architecture Plans					2%	100%	2%
Shortlist Consulting Firms					6%	100%	6%
Prepare Fellowship Program					6%	76%	4%
Prepare Civil Works Tendering					30%	0%	0%
Civil Works: Classrooms, Dorms, etc.					6%	0%	0%
Procurement of Furniture and Equipment					16%	10%	2%
Field Work of Consultants					7%	0%	0%
Provide Fellowships					6%	0%	0%
Conduct Study Tours					6%	0%	0%
Provide Curriculum Standards					6%	0%	0%
				Total Weight Imp. Progress	100%		24%

(a) Assigned weight for each activity

(b) Actual progress of each activity

(a) x (b) weighted progress for each activity

Project progress = sum of all weighted progress for each activity

E. Compliance with Covenants

5. Provide the following:

- the borrower's compliance with policy loan covenants such as sector reform initiatives and EA reforms, and the reasons for any noncompliance or delay in compliance;
- the borrower's and EA's compliance with financial loan covenants including the EA's financial management, and the provision of audited project accounts or audited agency financial statements; and

- the borrower's and EA's compliance with project-specific loan covenants associated with implementation, environment, and social dimensions.

F. Major Project Issues and Problems

6. Summarize the major problems and issues affecting or likely to affect implementation progress, compliance with covenants, and achievement of immediate development objectives. Recommend actions to overcome these problems and issues (e.g., changes in scope, changes in implementation arrangements, and reallocation of loan proceeds).

TERMS OF REFERENCE FOR THE PROJECT MANAGEMENT UNIT AND THE PROVINCIAL PROJECT IMPLEMENTATION UNITS

Table A6.1: Project Management Unit

Position	Job Description	Requirements
Ministry of Agriculture, Forestry and Fisheries		
National Coordinating Project Director (part time)	The PMU Coordinating Project Director reports to the PSC on the overall supervision and implementation of the project and ensures that the PSC and ADB are kept informed of project developments, issues and progress. The Director oversees and coordinates the work of PMU staff, and the recruitment and performance of international and national consultants, ensuring budgets and work plans are approved and executed on time and on target. The Director supervises and approves all project activities and expenditures.	A senior government official with at least 12 years' project management experience with preference to ADB project implementation. Master's degree or equivalent and competence in spoken and written English.
National Project Manager	The National Project Manager reports to the Coordinating Project Director, ensuring effective coordination among project stakeholders on implementation, administrative and finance aspects. The main duties involve preparing and implementing detailed annual work plans and budgets, coordinating all administrative/finance/procurement matters, managing project account to ensure timely disbursement for project activities, managing consultant recruitment and procurement, managing project fixed assets, and oversee implementation of the Project Performance Management System (PPMS). S/he reviews and endorses budget requests of Provincial Project Implementation Units (PPIUs) for onward submission for approval of the Project Director and will liaise with the National Technical Departments/Focal points of MOWRAM and MRD and will be supported by PIC.	A senior government official with at least 10 years project management experience A Master's degree or equivalent and competence in spoken and written English.
Financial Officer	The PMU Financial Officer will report to the Project Manager, overseeing the day-to-day financial management of the project and will be supported by the procurement officers and National Finance consultant. S/he will (i) facilitate the establishment of the necessary accounts at the PMU, MOWRAM, MRD and the PPIUs; (ii) establish the required accounting, withdrawal approval and audit systems and procedures; (iii) set up accounting software in line with project requirements; (iv) establish a system for safekeeping of tender documents, minutes of committee meetings, contracts and financial and audit reports; (v) prepare financial projections against the work plans; (vi) carry out a financial management training program for relevant PPIU staff; (vii) provide ongoing training and coaching to PPIUs as needed; and (viii) supervise the preparation of regular financial reports for transmission to the EA and the ADB.	A government official with formal accounting qualifications and at least 5 years previous experience in financial management of internationally financed projects, preferably projects financed by ADB or World Bank. Bachelor's degree or equivalent. Competence in spoken and written English.
Procurement Officer	The Procurement Officer reports to the Project Manager and work closely with the National Procurement Consultant ensuring all project procurement activities are undertaken in accordance with ADB's Procurement Guidelines. The procurement officer will be supported by a procurement assistant.	At least 5 years previous experience as procurement officer on ADB or internationally financed projects and good command of spoken and written English.
Safeguards Officer	The Environment, Safeguards, and Gender Officer reports to the Project manager and works closely with the PIC, ensuring implementation and monitoring of gender, social and environmental safeguards in accordance with ADB's SPS 2009. The Safeguards Officer will work closely with the international and national safeguards consultants on institutional strengthening and capacity building, updating IEEs/EMPs, RPs, IPP, and GAP	A degree in environment / social science and at least 3 years work experience in related field, preferably on internationally supported projects. Good command of spoken and written English.

preparing quarterly reports on safeguards compliance. Preparing quarterly reports on safeguards compliance.

M&E Officer	The M&E Officer reports to Project Manager ensuring the project M&E system is established, updated, monitored, and reported.	At least 3 years previous experience working as M&E officer on ADB or internationally financed projects. Ability to use Microsoft programs and good English ability.
Administrative Officer	The Office Assistant provides logistical support to the senior staff as needed. Frequently interacting with senior government officials, PPIU staff members and the consultants and acts as P.A. to the Project Manager.	At least 3 years previous experience working on ADB or internationally financed projects. Ability to use Microsoft programs and good English language ability.
Ministry of Water Resources and Meteorology (MOWRAM) – General Directorate of Technical Affairs		
MOWRAM Project Director	The MOWRAM Director will ensure effective coordination among project stakeholders on implementation, administrative and finance aspects. The main duties involve preparing and implementing detailed annual work plans and budgets, coordinating all engineering/admin/finance/ procurement, managing the project account to ensure timely disbursement for project activities, managing project fixed assets, and oversee implementation of the Project Performance Management System (PPMS). S/he reviews and endorses budget requests of Provincial Project Implementation Units (PPIUs) for onward submission for approval and will liaise with the National Technical Departments of MAFF and MRD and will be supported by PIC.	A senior government official with at least 10 years project management experience A Master's degree or equivalent and competence in spoken and written English.
National Project Manager	The National Project Manager reports to the Project Director, ensuring effective coordination among project stakeholders on implementation, administrative and finance aspects. The main duties involve preparing and implementing detailed annual work plans and budgets, coordinating all administrative/finance/procurement matters, managing project account to ensure timely disbursement for project activities, managing consultant recruitment and procurement, managing project fixed assets, and oversee implementation of the Project Performance Management System (PPMS). S/he reviews and endorses budget requests of Provincial Project Implementation Units (PPIUs) for onward submission for approval of the Project Director and will liaise with the Coordinating Project Director under the MAFF and with the Project Director of the National Technical Department of MRD.	A senior government official with at least 10 years project management experience A Master's degree or equivalent and competence in spoken and written English.
Civil Engineer	Reporting to the MOWRAM Project Director and working closely with the finance and procurement officers, the engineer will review the concept designs for works and preliminary cost estimates for each irrigation project (based on the survey results; work with contracted engineers to prepare feasibility designs and drawings needed for draftsman/AutoCad operators' tasks. S/He will, review the bill of quantities, costings as well as the determination of minimum material standards/technical specs per government standards and supervise the work of contractors during infrastructure development. The Engineer will ensure that the FWUCs or FWUGs receive sufficient training for the O&M of the completed schemes.	The engineer will have at least 5 years previous experience in the design and monitoring of water management and irrigation systems on ADB or internationally financed projects and good command of spoken and written English

Financial Officer	The MOWRAM Financial Officer will report to the MOWRAM Project Director, overseeing the day-to-day financial management of the MOWRAM project activities and will be supported by the procurement officer and National Finance consultant S/he will (i) facilitate the establishment of the necessary account at the PMU and the PPIUs; (ii) establish the required accounting, withdrawal approval and audit systems and procedures; (iii) set up accounting software in line with project requirements; (iv) establish a system for safekeeping of tender documents, minutes of committee meetings, contracts and financial and audit reports; (v) prepare financial projections against the work plans; (vi) carry out a financial management training program for relevant PPIU staff; (vii) provide ongoing training and coaching to PPIU's as needed; and (viii) supervise the preparation of regular financial reports for transmission to the PMU EA and the ADB.	A government official with formal accounting qualifications and at least 5 years previous experience in financial management of internationally financed projects, preferably projects financed by ADB or World Bank. Bachelor's degree or equivalent. Competence in spoken and written English.
Procurement Officer	The Procurement Officer reports to the Project Director and work closely with the National Procurement Consultant ensuring all project procurement activities are undertaken in accordance with ADB's Procurement Guidelines.	At least 5 years previous experience as procurement officer on ADB or internationally financed projects and good command of spoken and written English
Administrative Officer	The Office Assistant provides logistical support to the senior staff as needed. Frequently interacting with senior government officials, PPIU staff members and the consultants and acts as P.A. to the Project Manager.	At least 3 years previous experience working on ADB or internationally financed projects. Ability to use Microsoft programs and good English language ability.
Ministry of Rural Development – General Directorate of Technical Affairs		
MRD Project Director	The National Project Manager reports to the Project Director, ensuring effective coordination among project stakeholders on implementation, administrative and finance aspects. The main duties involve preparing and implementing detailed annual work plans and budgets, coordinating all admin/finance/procurement, managing project account to ensure timely disbursement for project activities, managing consultant recruitment and procurement, managing project fixed assets, and oversee implementation of the Project Performance Management System (PPMS). S/he reviews and endorses budget requests of PPIUs for onward submission for approval of the Project Director and will liaise with the National Technical Departments/Focal points of MOWRAM and MAFF and will be supported by PIC.	A senior government official with at least 10 years project management experience A Master's degree or equivalent and competence in spoken and written English.
National Project Manager	The National Project Manager reports to the Project Director, ensuring effective coordination among project stakeholders on implementation, administrative and finance aspects. The main duties involve preparing and implementing detailed annual work plans and budgets, coordinating all administrative/finance/procurement matters, managing project account to ensure timely disbursement for project activities, managing consultant recruitment and procurement, managing project fixed assets, and oversee implementation of the Project Performance Management System (PPMS). S/he reviews and endorses budget requests of Provincial Project Implementation Units (PPIUs) for onward submission for approval of the Project Director and will liaise with the Coordinating Project Director under the MAFF and with the Project Director of the National Technical Department of MOWRAM.	A senior government official with at least 10 years project management experience A Master's degree or equivalent and competence in spoken and written English.

Civil Engineer	The civil/roads engineer will report to the PRD Project Director and work closely with the financial and procurement officers. In collaboration with commune and local authorities oversee the tender procedures for rural road rehabilitation and assist in the evaluation of tenders. S/He will work with the contractors to ensure full compliance with the proposed work and is according to schedule as per the work plan and elaborate progress reports. The engineer will ensure that the local community is trained in the repair and maintenance of the roads through the use of MRD staff or outsourcing.	The engineer will have at least 5 years previous experience in the design and monitoring of rural road planning and development on ADB or internationally financed projects and good command of spoken and written English.
Financial Officer	The Financial Officer will report to the PRD Project Director, overseeing the day-to-day financial management of the project and will be supported by the procurement officers and National Finance consultant. S/he will (i) facilitate the establishment of the necessary accounts at the MRD and the PPIUs; (ii) establish the required accounting, withdrawal approval and audit systems and procedures; (iii) set up accounting software in line with project requirements; (iv) establish a system for safekeeping of tender documents, minutes of committee meetings, contracts and financial and audit reports; (v) prepare financial projections against the work plans; (vi) carry out a financial management training program for relevant PPIU staff; (vii) provide ongoing training and coaching to PPIUs as needed; and (viii) supervise the preparation of regular financial reports for transmission to the EA and the ADB.	A government official with formal accounting qualifications and at least 5 years previous experience in financial management of internationally financed projects, preferably projects financed by ADB or World Bank. Bachelor's degree or equivalent. Competence in spoken and written English.
Procurement Officer	The Procurement Officer reports to the MRD Project Director and works closely with the National Procurement Consultant ensuring all project procurement activities are undertaken in accordance with ADB's Procurement Guidelines.	At least 5 years previous experience as procurement officer on ADB or internationally financed projects and good command of spoken and written English
Administrative Officer	The Office Assistant provides logistical support to the senior staff as needed. Frequently interacting with senior government officials, PPIU staff members and the consultants and acts as P.A. to the Project Manager.	At least 3 years previous experience working on ADB or internationally financed projects. Ability to use Microsoft programs and good English language ability.

Table A6.2: PPIU Job Descriptions

Position	Job Description	Requirements
Provincial Project Implementation Unit Director	The PPIU Director oversees implementation of project activities at provincial level. Main duties include leading preparation of the provincial project work plan and budget, coordinating with related government agencies and development partners in the implementation of civil works subprojects and capacity building activities, ensuring compliance with provincial policies and regulations, supervising and approving all project activities and PIU expenditures.	The Director PD AFF
PPIU Deputy Director Water Management Systems	The PPIU Deputy Director reports to PPIU Director ensuring effective implementation of project activities in relation to water management rehabilitation activities and FWUC capacity building. Main duties include assisting PPIU Director in coordinating development of provincial work plan and budget, coordinating with related government agencies and development partners in the implementation of civil works subprojects and capacity building activities, supervising and reviewing design engineers work and following up and monitoring field implementation, and consolidating and reporting project benefit monitoring and evaluation.	PDWRAM Government Official

Position	Job Description	Requirements	
	S/he will be responsible for the monitoring and evaluation within the water management systems for social safeguards and social development as well as gender.		
PPIU Deputy Director Farm and Rural Roads	<p>The PPIU Deputy Director reports to PPIU Director ensuring effective implementation of project activities in relation to rural farm roads and track and storage unit market connectivity.</p> <p>Main duties include assisting PPIU Director in coordinating development of provincial work plan and budget, coordinating with related government agencies and development partners in the implementation of civil works subprojects and capacity building activities particularly for O&M, supervising and reviewing design engineers work and following up and monitoring field implementation, and consolidating and reporting project benefit monitoring and evaluation.</p> <p>S/he will be responsible for the monitoring and evaluation within the rural roads network for social safeguards and social development as well as gender.</p>	PDRD Official	Government
PIU Cooperative Promotion and Development	<p>The officer reports to PPIU Director ensuring effective implementation of project activities in relation to agricultural promotion and storage unit implementation.</p> <p>Main duties include assisting PPIU Director in coordinating development of provincial work plan and budget, coordinating with contractors, related government agencies and development partners in the implementation of civil works subprojects and capacity building activities particularly for O&M, supervising and reviewing design engineers work and following up and monitoring field implementation, and consolidating and reporting project benefit monitoring and evaluation.</p> <p>The coordinator will also be responsible for the monitoring and evaluation within the agricultural cooperative activities for social safeguards and social development as well as gender.</p>	Provincial officer with agricultural cooperative development responsibilities	
PPIU Agricultural Extension	<p>The officer reports to PPIU Director ensuring effective implementation of project activities in relation to on-farm irrigation, extension and training activities.</p> <p>Main duties include assisting PPIU Director in coordinating development of provincial work plan and budget, coordinating with contractors, related government agencies and development partners in the implementation of civil works subprojects and capacity building activities particularly for O&M, CSA, and other standards as well as mechanization and use of agricultural machinery following up and monitoring field implementation, and consolidating and reporting project benefit monitoring and evaluation.</p> <p>The coordinator will also be responsible for the monitoring and evaluation within the on-farm irrigation and capacity building activities for social safeguards and social development as well as gender.</p>	Provincial officer with agricultural responsibilities, with experience in capacity building and on-farm irrigation technologies	
PPIU Animal Health and Production	<p>The officer will report to PPIU Director ensuring effective implementation of project activities in relation to biodigesters and bio-slurry and standards compliance.</p> <p>Main duties include assisting PPIU Director in coordinating development of provincial work plan and budget, coordinating with</p>	Provincial Officer with responsibility for biodigesters and bio-slurry use	

Position	Job Description	Requirements
	<p>related contractors/builders, government agencies and development partners in the implementation of civil works subprojects and capacity building activities particularly for O&M, biodigesters and use of compost huts, supervising and reviewing design engineers work and following up and monitoring field implementation, and consolidating and reporting project benefit monitoring and evaluation.</p> <p>The coordinator will also be responsible for the monitoring and evaluation within the remit of biodigesters and bio-gas for social safeguards and social development as well as gender.</p>	
Administration Officer	<p>The Administration Officer reports to the PPIU Director overseeing the establishment and monitoring the PPIUs accounting systems and procedures, tracks the use of project funds, and ensures accurate up-to-date financial accounting information is available to the PPIU</p>	<p>At least 3 years of experience as accountant on ADB or internationally financed projects. Ability to use accounting and word processing software. Working ability in English.</p>

ADB = Asian Development Bank; MAFF = Ministry of Agriculture, Forestry and Fisheries; MOWRAM = Ministry of Water Resources and Meteorology; PDAFF = Provincial Department of Agriculture, Forestry and Fisheries; PDRD = Provincial Department of Rural Development; PDWRAM Provincial Department of Water Resources and Meteorology; PMU = project management unit; MRD = Ministry of Rural Development; PPIU = provincial project management unit; PIC = project implementation consultants.

PRO-FORMA SUB-PROJECT FEASIBILITY STUDY REPORT

Acronyms

Map of Subproject Area

- I. Rationale for the Subproject
 - A. Need and Justification for the Investment
 - B. Related Development Initiatives
- II. Subproject Context
 - A. Natural Features
 - B. Social-economic and Cultural Conditions
 - C. Engineering Conditions and Requirements
 - 1. Description of the Irrigation Scheme
 - 2. General Description of Irrigation Network
 - 3. Main Constraints
- III. Subproject Objectives
 - A. Project Outcome and Impact
 - B. Project Outputs
- IV. Design and Due Diligence Process
 - A. Subproject Selection Process
 - B. Technical Design Methodology
 - 1. Irrigation Rehabilitation and Upgrading
 - 2. Other Investments
 - C. Economic Analysis
 - 1. Benefits
 - 2. Economic Returns
 - 3. Household Financial Returns
 - D. Environment and Social Safeguards
 - 1. Environment
 - 2. Indigenous Peoples
 - 3. Involuntary Resettlement
 - 4. Gender Mainstreaming
 - E. Monitoring, Reporting and Evaluation
 - 1. Performance Indicators
 - 2. Evaluation Arrangements
 - 3. Reporting Arrangements
 - F. Risks and Mitigating Measures
- V. Total Investment and Financing Plan
- VI. Subproject Implementation and Operating Arrangements
 - A. Execution and Implementation Agencies
 - B. Subproject Implementation Management
 - 1. Output 1
 - 2. Output 2
 - C. Subproject Implementation Schedule
 - D. Subproject Procurement

Annex 1 – Subproject Design and Monitoring Framework

Annex 2 – Subproject Socio Economic Survey and Analysis

Annex 3 – Subproject Economic and Financial Analysis

Annex 4 – Subproject Resettlement Plan
Annex 5 – Subproject Initial Environmental Examination
Annex 6 – Water Requirements and Availability
Annex 7 – Engineering Drawings
Annex 8 – Bills of Quantities Methodology
Annex 9 – Agricultural Survey Report