

PILOT PROGRAM FOR CLIMATE RESILIENCE			
• SUMMARY PROJECT/PROGRAM APPROVAL REQUEST			
1. Country/Region:	Cambodia	2. CIF Project ID#:	XPCRKH011A
3. Project Name:	Promoting Climate-Resilient Agriculture in Koh Kong and Monduliri Provinces as part of the Greater Mekong Subregion Biodiversity Conservation Corridors Project		
4. Type of PPCR Investment	<i>Private</i>	<i>Public 100%</i>	<i>Mixed</i>
5. Funding Request (in USD million total) for Project/Program:	<i>Grant: \$7.4 million</i>		<i>Loan:</i>
6. Approved Preparation Grant (in USD million):	<i>\$0.6 million</i>		<i>Date: 29 June 2011</i>
7. Implementing MDB	<i>Asian Development Bank</i>		
8. Other MDB Involvement	<i>None</i>		<i>Type of Involvement: None</i>
9. National Project Focal Point:	<i>Ministry of Economy and Finance (MEF)</i>		
10. National Implementing Agency (project/program):	<i>Ministry of Agriculture, Forestry, and Fishery (MAFF) Ministry of Environment (MOE)</i>		
11. MDB PPCR Focal Point and Project/Program Task Team Leader (TTL):	<i>ADB PPCR Focal Point: Cinzia Losenno, Senior Environment Specialist (Climate Change Adaptation) Regional and Sustainable Development Department</i>		<i>TTL: Thuy Trang Dang, Environment Specialist South East Asia Department</i>

12. Project Description

The Royal Government of Cambodia (RGC) seeks approval of \$7.4 million in grant resources from the Strategic Climate Fund under the Pilot Program for Climate Resilience (PPCR) for the *Promoting Climate-Resilient Agriculture in Koh Kong and Monduliri Provinces as part of the Greater Mekong Subregion Biodiversity Conservation Corridors (BCC) Project*¹.

The Cambodia Strategic Program for Climate Resilience (SPCR) was endorsed by the PPCR Sub Committee on 29 June 2011 in its original version, and on 13 January 2014 in its revised version. The SPCR indicates that agriculture and water resources are the most important sectors for the Cambodian economy, with around 57.6% of the population relying on agriculture for their livelihood. The National Adaptation Program of Action (NAPA)² determined that both sectors are highly vulnerable to climate change. Increased rainfall variability impacts surface and ground water availability and may have negative effects on potable water supply, flood protection and irrigation.

In December 2010, ADB approved a grant of \$19 million from ADB's Special Fund resources to the Kingdom of Cambodia for the Greater Mekong Subregion BCC Project.³ The impact of the BCC Project is climate-resilient sustainable forest ecosystems benefiting local livelihoods. The outcome is sustainably managed biodiversity corridors in Koh Kong and Monduliri provinces. The outputs include:

- (i) institutions and communities strengthened for biodiversity corridor management;
- (ii) biodiversity corridors restored, protected, and maintained;
- (iii) livelihoods improved and small-scale infrastructure support provided in target villages and communes; and
- (iv) project management and support services operationalized.

The Ministry of Environment (MOE) and the Ministry of Agriculture, Forestry and Fisheries (MAFF) of the Government of Cambodia (Government) are the executing agencies (EAs) of the BCC Project. Each EA has an implementing agency (IA) in each of the BCC Project provinces. The IAs for MAFF are the Koh Kong and Monduliri Forestry Administration cantonment offices, responsible for communities managing the Community Forests in the provinces. The IAs for MOE are the Koh Kong and Monduliri Protected Area divisions. The MOE EA and its associated IAs work in communities managing the Community Protected Areas in each province.

As stated in the SPCR, PPCR funding will be used to strengthen the climate change adaptation measures of the BCC Project. The *"Promoting Climate-Resilient Agriculture in Koh Kong and Monduliri Provinces as part of the Greater Mekong Subregion Biodiversity Conservation Corridors Project"* Project aims at strengthening adaptive capacity and reducing climate vulnerability of ecosystems and communities in the Koh Kong and Monduliri provinces.⁴

¹ This is Project 1 of Component II of the Cambodia Strategic Program for Climate Resilience.

² The main goal of the Cambodian NAPA is to provide a framework to guide the coordination and implementation of adaptation initiatives through a participatory approach, and to build synergies with other relevant environment and development programs. Cambodia's NAPA presents priority projects to address the urgent and immediate needs and concerns of people at the grassroots level for adaptation to the adverse effects of climate change in key sectors such as agriculture, water resources, coastal zone and human health.

³ ADB. 2010. Report and Recommendation of the President to the Board of Directors. Proposed Loan and Grants Kingdom of Cambodia, Lao Peoples Democratic Republic, and Socialist Republic of Viet Nam: Greater Mekong Subregion Biodiversity Conservation Corridors Project.

⁴ The ADB Board Paper for the Project is referred to as Additional Financing: Proposed Administration of Grant Kingdom of Cambodia: Greater Mekong Subregion Biodiversity Conservation Corridors Project.

The proposed PPCR interventions are consistent with the BCC Project's impact, the country operations business plan (2014-2016), and government priorities, including the NAPA in agriculture and water resources.

Climate Risk and Vulnerability Assessment. The communities and the ecosystems in Koh Kong and Mondulakiri provinces are at risk from anticipated climate change impacts. Ten out of twelve BCC Project communes in Mondulakiri and five out of ten BCC communes in coastal Koh Kong are highly vulnerable to climate change. Table 1 shows the exposure, sensitivity and adaptive capacity of the communities in Koh Kong and Mondulakiri provinces.

Table 1: Exposure, Sensitivity and Adaptive Capacity

Province	Climate Risk	Exposure	Sensitivity	Adaptive Capacity
Koh Kong (in communes along the coast)	Saltwater intrusion and high tide	High	High	Low
	Drought	Medium to High	High	Low
	Storm / heavy rain	Medium	High – Medium	Medium
	Storm Surge	High	High	Low
	Flash Floods	High	High	Low
Mondulakiri	Delayed / shortened rainy season with dry spells	Medium	Medium	Medium
	Drought	High	High	Low
	Storms	High	High	Low
	Heavy rain / flash flooding	Medium to High	High	Medium

Source: PPCR project preparation (Supplementary Appendix M to the Board Paper – Climate Change Impact Modeling and Vulnerability Assessment)

Climate change assessment for the two provinces shows that temperatures are expected to increase between 0.7°C (RCP4.5) and 1.0°C (RCP8.5)⁵ by 2025. The trend to greater frequency of long-term droughts could be the feature of climate change that may have the most severe impact for the next 20 years. This might lead to less groundwater due to less recharge and greater extraction. Percentage of precipitation (rainfall) in Koh Kong is expected to decline and sea levels are projected to rise above the 1986-2005 baseline by 10cm by 2025. The number of hot days and heat wave duration (HWD) are set to increase in both provinces compared to 1990. In Mondulakiri, projected increases in extreme rainfall amounts also suggest more likely risk of floods. In Koh Kong, more frequent and longer droughts may lead to more saltwater intrusion and sea-level rise, likely to be more important in winter when annual sea level is highest.

⁵ Supplementary Appendix - Climate Change Impact Modeling and Vulnerability Assessment - Using the simulations driven by Representative Concentration Pathways (RCPs), which describe a wide range of potential futures for the main drivers of climate change - greenhouse gas and air pollutant emissions and land use - two emissions scenarios were considered: RCP 4.5 (lower greenhouse gas concentrations) and RCP 8.5 (higher greenhouse gas concentrations).

Annual Changes by 2025	Koh Kong		Mondulkiri	
	RCP4.5	RCP8.5	RCP4.5	RCP8.5
Temperature (mean) C degrees	0.7	1.0	0.8	1.0
Precipitation (mean) %	-1	-2.5	0	0
No. of Hot days 1990/2025	5/13		7/14	
HWD (mean) 1990/2025	8.7/9.6		9.4/10.1	
Sea level rise (cm) 2025	10		-----	

Note: Relative to 1990 for RCP 4.5 and RCP 8.5 based upon 20 year averages; HWD= Heat Wave Duration

Source: PPCR project preparation (Supplementary Appendix M to the Board Paper – Climate Change Impact Modeling and Vulnerability Assessment)

Based on a climate change modeling, vulnerability assessment and stakeholders' consultations, the following priority interventions were identified:

Mondulkiri	Koh Kong
Improved access to water during drought by providing rainwater harvesting ponds for affected communes. Model subproject in Romonea commune is to be replicated in other communes vulnerable to drought.	Improved access to water during drought by providing rainwater harvesting ponds for coastal communes that are vulnerable to drought, based on experience in model subproject in Romonea commune
Water conservation and productivity enhancement techniques for fruit and vegetables; income improvement through facilitation of local trading of fruit and vegetables in villages where rainwater harvesting ponds are to be provided	Water conservation and productivity enhancement techniques for fruit and vegetables; income improvement through facilitation of local trading of fruit and vegetables in villages where rainwater harvesting ponds are to be provided
Climate-proof irrigation scheme and introduce Cambodian System of Rice Intensification (SRI) ⁶ model in Srae Chrey sub-village, Nang Khi Lik commune, to alleviate increased drought risk	Salinity reduction measures through sea barriers in Andeung Tuek and Kandol communes
Ecosystem-based adaptation through improved forest cover, soil and water management and planning in two catchments in Mondulkiri	Training on saline resilient crops in Andeung Tuek and Kandol communes

PPCR interventions. The PPCR funds will be used to enhance climate resilience of an additional 4,300 households in the BCC Project area and support diversified livelihoods and income generating opportunities. The design and monitoring framework of the BCC Project has been revised to reflect the additional results to be achieved with the PPCR funds under outputs 3 and 4 (Appendix to the ADB Board Paper). The overall impact of the BCC Project, which is 'climate-resilient sustainable forest ecosystems benefiting local livelihoods', is expected to be highly strengthened by PPCR funded interventions. In order to ensure complementarity and additionality to the BCC project, the following criteria were used to prioritize the PPCR interventions: (i) improve

⁶ SRI is a methodology for increasing the productivity of irrigated rice by changing the management of plants, soil, water and nutrients. Healthier soil and plants, reduced water use, and higher yield are some of the advantages of SRI.

climate resilience in the BCC communes and ecosystems most vulnerable to climate variability and change; (ii) feasibility of implementation within BCC project implementing structure; (iii) potential for scaling up interventions and integrating climate resilience into development policies; (iv) building on the BCC project and other ongoing initiatives, and avoiding duplication of effort; and (v) potential for knowledge sharing.

On this basis, **output 3** of the ongoing BCC Project will be expanded to include the following interventions:⁷

- (i) Rainwater harvesting ponds and drip irrigation for increased climate resilient high value crop productivity in Mondulkiri and Koh Kong;⁸
- (ii) Climate resilient irrigation and SRI in Mondulkiri;⁹
- (iii) Bioengineered sea barriers¹⁰ reducing saltwater intrusion in Koh Kong and adoption of salinity resistant crops;¹¹ and
- (iv) Ecosystem based adaptation to improve forest cover, soil and water management through catchment development planning and investment in Mondulkiri.¹²

Under output 3, extensive training and capacity building will be provided to the communities on the following: (i) best SRI practices in Cambodia, including water conservation techniques, pest management, fertilizer application, land preparation; (ii) branding schemes for high value rice and non-rice products; (iii) rice seed production cooperative organization; (iv) best practices of production of saline-resilient and drought resilient crops in Cambodia, including drip irrigation, water conservation techniques, use of micro-irrigation, raised beds, crop-rotation, plastic and vegetative mulching, green manures, and composting as appropriate; (v) operation and management (O&M) of the water-harvesting ponds, the irrigation scheme and the sea-barriers; (vi) best practices of community fish production in the rainwater harvesting ponds; (vii) storage plans for household consumption and marketing plans for surplus of home garden products; (viii) infant and family nutrition, the link between infant weight and adult health and home garden products linking to provision of rainwater harvesting ponds and horticultural production; (ix) mangrove nursery establishment and maintenance and mangrove planting; and (x) forest conservation planning and implementation of measures aimed at ensuring habitat restoration through reforestation and forest conservation, such as inventory, GIS-based patrolling, and planting. This output will include also sustainable use of forest resources to promote economic diversification. All training materials will be gender and indigenous peoples friendly.

Capacity of the EAs, implementing agencies and relevant agencies such as the Ministry of Water Resources and Meteorology and their provincial offices will also be developed on (i) selection of crops based on climate resiliency, value chain analysis, maximized returns to labor, and potential for production in the target communities in Koh Kong and Mondulkiri; (ii) market opportunities for horticultural production in Koh Kong and Mondulkiri; (iii) community-based and ecosystem-based adaptation; (iv) climate proofing of sea barriers and irrigation schemes based on climate parameters; and (v) and integration of climate integrate climate change concerns into development planning and budgeting.

Output 4 of the ongoing BCC Project will be expanded to include the following: (i) consulting services which covers incremental increase in inputs from several positions in the existing consultant team to help manage the PPCR-funded activities such as team leader, safeguards and

⁷ See Board Paper and its Appendix – project design and monitoring framework.

⁸ Feasibility Study of the intervention can be found in Supplementary Appendix P to the Board Paper.

⁹ Feasibility Study of the intervention can be found in Supplementary Appendix Q to the Board Paper.

¹⁰ Earthen dikes which are planted with mangroves.

¹¹ Feasibility Study of the intervention can be found in Supplementary Appendix R to the Board Paper.

¹² Framework for the intervention can be found in Supplementary Appendix S to the Board Paper.

gender specialists, engineers and procurement specialist, as well as a number of positions to support new areas of work including ecosystem-based adaptation, catchment planning and climate-resilient crops; and (ii) incremental project implementation management costs that include (a) project monitoring and reporting, including PPCR core indicators, knowledge documentation and sharing; (b) procurement, incremental operations costs; and (c) incremental safeguard monitoring costs. A Project Administration Manual (Supplementary Appendix B to the Board Paper) has been updated to guide the implementation of the additional activities funded by the PPCR.

Additional Output 3 interventions supported by PPCR financing are detailed in supplementary appendices P, Q, R and S, respectively and summarized below:

Intervention 1 - Rainwater harvesting ponds and drip irrigation for increased climate resilient high value crop productivity.

This intervention aims to reduce vulnerability to longer dry season drought. A model subproject will construct rainwater harvesting pond in Srea I to provide sufficient water for intensive dry season cropping for 50 households, including (i) water for cattle drinking, (ii) supplementary water for household use; and (iii) irrigation of 300m² per household of intensive horticultural production of, but not limited to, maize, cucumber, bean, cabbage, and tomato¹³. This model subproject will be expanded to approximately 14 villages vulnerable to prolonged droughts benefitting a total of 2,000 households or 10,000 beneficiaries (on average each village has 150 households and ponds will be constructed in each target village to supply all households). The first pond will be built in 2015 and subsequent ponds from 2015 to 2017, with capacity support provided throughout the project life. The subprojects will also (i) develop skills of the water user groups (WUG) in operation and maintenance (O&M); (ii) develop use and application of water conservation techniques and techniques to improve productivity; (iii) facilitate local trading of fruit and vegetables; and (iv) train farmers on drip irrigation, vegetable production models and demonstrations, fingerling stocking and feeding. See Supplementary Appendix P to the Board Paper for details.

Intervention 2 – Climate Resilient Irrigation and Cambodian SRI in Mondulkiri.

This intervention will support high priority investments in major rice-producing district of Mondulkiri: the Koh Nhaek district. The intervention will be developed on a small scheme with 65 farming households (325 individual direct beneficiaries) and will further benefit about 1,000 households through training of SRI. It will introduce provincial authorities to design of climate-proof irrigation schemes and to Cambodian SRI techniques. The intervention will: (i) rehabilitate and climate proof an irrigation system for a command area of 250 ha in Kaoh Nheaek district in Mondulkiri; (ii) mobilize Water User Groups (WUGs) and develop skills in operation and maintenance (O&M); and (iii) introduce Cambodian SRI. Irrigation rehabilitation and climate proofing will help increase productivity and cropping intensities. See Supplementary Appendix Q to the Board Paper for details.

Intervention 3 – Bioengineered Sea Barriers and Coastal Climate Change Adaptation to Reduce Saltwater Intrusion.

This intervention will improve incomes from rice and various other crops and will protect coastal communities from saltwater incursion during high tides in December to February. The intervention will directly assist 400 households. This intervention will (i) construct 15 km of bioengineered sea barriers in Andeung Teuk and Kandol communes; (ii) introduce salinity-resilient crops through demonstration farms and training; and (iii) provide capacity building on O&M of the sea barriers. See Supplementary Appendix R to the Board Paper for details.

Intervention 4 – Ecosystem-based adaptation in two catchments in Mondulkiri.

This intervention will reduce vulnerability of rural communities living in and near protected areas and protected forests in Mondulkiri. These communities are the most vulnerable to climate change

¹³ Considering the climate, these crops have been taken as the basis for estimating the crop water requirement for system design. During implementation crops will be selected based on (i) nutrition needs, (ii) market analysis in case there is surplus, (iii) higher number of species and diversity including herbs and spices

because of their dependence on ecosystem services and a lack of alternative, climate-resilient livelihoods. As a result of changes in rainfall and consequent decreasing agricultural productivity, these communities are increasingly reliant on forest ecosystems to provide supplementary food sources and income. Widespread degradation of forest ecosystems, however, is reducing the efficacy of this adaptation response. Building on the BCC project activities in establishing and managing community forests and community protected areas, this intervention will reduce flood risk, sustain agricultural/food production, improve soil quality and provide safety net to the communities during drought, conserve biodiversity and ecosystems and support local livelihoods through sustainable use¹⁴ of forest resources in two catchments in Monduliri.

This intervention will seek to achieve coordinated planning and management of catchment resources through a catchment governance committee where decisions can be taken across a range of sectors in the catchment and existing sector managers can be involved in the catchment decisions. Catchments will be selected by the EAs in consultation with the communities living in the catchments, who are participating in the management of forests and protected areas under the BCC project. While the exact number of households to benefit from the intervention is unknown before all the catchments are identified, given the population in Monduliri, it is estimated that at least 900 households will benefit from this pilot.

In this intervention, communities will (i) identify criteria to screen and prioritize activities in water management, agriculture, forestry, and livelihood options; (ii) formulate and implement forest conservation plans including reforestation for habitat restoration, forest conservation and sustainable use of forest resources; and (iii) plan for investments in the catchment that will improve climate resilience including catchment risk mapping and monitoring, flood proofing, and forest-based livelihoods or alternative climate resilient livelihoods such as intensifying/diversifying existing agricultural areas and introducing conservation agriculture practices. With support from the catchment planners to be funded under the PPCR grant, the EAs will (i) develop guidelines and rules for a catchment governance committee based on review of experience in Cambodia and other countries; (ii) coordinate the establishment of governance committees; (iii) evaluate the effectiveness of selected activities and investments for improving climate resilience; and (iv) identify issues and provide recommendations if a catchment landscape approach is to be adopted more widely in Cambodia.

A possible catchment for inclusion in this intervention in Srea Preah commune in the O Por catchment in Monduliri. The three villages of Pu Char, Pu Kong and Ou Char with a total population of 174 households in this commune are extremely vulnerable to the expected increases in prolonged drought, number of hot days and heat waves, enhanced evaporation and the resulting increase in pest and pathogen populations. An opportunity arises to further enhance the resilience of the ecosystems and the communities in Srea Preah where the Seima Protection Forest and its surroundings are located, due to the long engagement by ADB in the first phase of the Biodiversity Conservation Corridors Initiative (2006-2010), and followed up activities supported by the ongoing BCC Project. A strong presence of an international conservation organization, Wildlife Conservation Society, in the area has been helpful in promoting a community and ecosystem based approach towards climate change resilience. Activities are proposed to be in an area of approximately 9,000ha in the buffer zone¹⁵ of the Seima Protection Forest in Srae Preah commune. This

¹⁴ A recent guideline developed by WWF, World Bank and the government of Viet Nam support sustainable use of ecosystem products and services as an important component of ecosystem-based adaptation: http://awsassets.panda.org/downloads/wwf_wb_eba_project_2014_gms_ecosystem_based_adaptation_general_framework.pdf

¹⁵ This buffer zone is peripheral to the Seima protected forest. It is equivalent to category VI of the IUCN, which is defined as 'areas that conserve ecosystems and habitats, together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in a natural condition,

intervention would aim to conserve forests and ecosystem services, including protection of the watershed, protection against landslides, erosion and land degradation, protection of habitats of aquatic and terrestrial animals, and sustainable use of forest resources to buffer the impacts of climate change on water users and provide safety nets for local communities when agricultural crops fail .

Sustainability of this intervention will be ensured by: (i) collaborating with communities, fostered by the consultative and participatory approach under the PPCR grant; (ii) training of local communities on climate change adaptation responses; (iii) establishing multi and sustainable use of forests based on forest inventory that will incentivize protection of the forests because of the value of the productive landscape; (iv) drawing lessons and recommending revisions to policy and legislation on community forests especially on sustainable use and tenure; (v) reforestation of degraded land; and (vi) training communities on business plan development to ensure that alternative livelihoods are successfully implemented. See Supplementary Appendix S to the Board Paper for details. This intervention will complement activities planned in a proposed ADB/GEF project in the upper Prek Thnot watershed of Cambodia, which aims to improve on-farm soil and water management practices and promote forest ecosystem restoration in a community forest in the province of Phnum Sruoch.¹⁶

13. Objective

The objective of the PPCR funds is to increase climate resilience of the communities and reduce vulnerability of the ecosystems supported by the ongoing BCC Project.

14. Expected Outcome

The PPCR funds will contribute to the outcome of the ongoing BCC Project, which is sustainably managed biodiversity corridors in Cambodia with enhanced climate resilience.

15. Main Interventions and Indicators for Success (consistent with PPCR Core Indicators):

Results	Indicators/Targets
1. Strengthened climate responsive development planning	<p>Core indicator 1: Degree of integration of climate change into national, including sector planning, as reflected by:</p> <ul style="list-style-type: none"> Three case studies on integration of climate change in design of water infrastructures such as sea barriers, irrigation, and rainwater harvesting ponds developed, documented and discussed within MOE and MAFF, and with relevant ministries such as Ministry of Water Resources and Meteorology in at least 3

where a proportion is under sustainable natural resource management and where low-level non-industrial use of natural resources compatible with nature conservation is seen as one of the main aims of the area.

¹⁶ Collaborative Management for Watershed Ecosystem Service Protection and Rehabilitation in the Cardamom Mountains, Upper Prek Thnot River Basin

	<p>workshops</p> <ul style="list-style-type: none"> • One policy¹⁷ improvement on community forestry as an ecosystem-based adaptation measure, through empowerment of communities in forest conservation to improve climate resilience • Policy recommendations for climate proofing of sea barriers and irrigation infrastructure developed and discussed with MOE, MAFF and Ministry of Water Resources and Meteorology
2. Improved institutional framework in place	<p>Core indicator 2: Evidence of strengthened government capacity and coordination mechanism to mainstream climate resilience, as reflected by:</p> <ul style="list-style-type: none"> • 65 provincial and district officials acquire capacity to integrate climate change concerns into development planning and budgeting • Capacity of provincial officials developed on catchment planning and investments in Mondulkiri • Provincial officials in Koh Kong update standards for climate proofing of sea barriers
3. Climate responsive investment approaches identified and implemented	<p>Core Indicator 3: Quality and extent to which climate responsive instruments / investment models are developed and tested, as reflected by:</p> <ul style="list-style-type: none"> • 15 km of bioengineered sea barriers with self-closing culverts preventing incursion of saline water during winter high tides benefiting 750 ha • 40 rainwater harvesting ponds for 60 ha of home garden crop production • One climate resilient irrigation scheme rehabilitated with a command area of 250 ha • 9000-ha of forest sustainably managed for ecosystem-based adaptation • Climate resilient construction standards for irrigation, rainwater harvesting ponds, and sea dykes are tested in the PPCR-funded project area
4. Strengthened adaptive capacities	<p>Core indicator 4: Extent to which vulnerable households and communities use improved PPCR supported tools, instruments, strategies and activities</p>

¹⁷ Targeting Sub-decree on Community Forestry (2003) and Community Forestry Guidelines (Prakas) issued by MAFF in 2006

	<p>to respond to climate variability and climate change, as reflected by:</p> <ul style="list-style-type: none"> • 1,000 households adopt climate resilient Cambodian SRI • 400 households benefit from reduced seawater intrusion with enhanced productivity from salinity-resistant crops • 2,000 households have reliable water for cattle and home gardens • 900 households benefit from reduced flood risk, improved soil quality, and reduced impact from drought by diversifying income and climate resilient livelihoods through ecosystem based adaptation in two catchments
<p>5. Increased resilience of households, communities, businesses, sectors and society to climate variability and climate change</p>	<p>Core Indicator 5: Number of people supported by the PPCR to cope with climate change and climate variability: About 4,300 households to benefit from project interventions, in which:</p> <ul style="list-style-type: none"> • 80% women trainees on training to improve home garden productivity and water conservation; • 40% women trainees on system of rice intensification; • 50% women farmers involved in mangrove planting • 25-30% women farmers for demonstration plots for salinity-resilient crops; • 30% women in management positions in water users groups and forest conservation groups; and • 30% of water users groups women members to be trained in operation and maintenance

16. Budget (indicative):

Expenditure	PPCR Grant Amount (US\$'000)
A. Investment Costs	
1. Civil Works	3,166
2. Vehicles and Equipment	87
3. Goods and services	56
4. Capacity Building, Training, Workshops	1,045
5. Consulting Services	1,970
International Consultants	1,457
National Consultants	513
6. Project Implementation Management	338
Subtotal (A)	6,661
B. Recurrent Costs	134
Subtotal (B)	134

Total Base Cost (A+B)	6,795
C. Contingencies	605
Total Cost	7,400

17. Timeframe (tentative)

- Expected Board/MDB Management approval date: December 2014
- Expected effectiveness date: March 2015
- Expected Project/Program closure date: September 2019

18. Other Partners involved in Project Design and Implementation:

During project formulation, coordination and cooperation was achieved through a series of consultation workshops, joint field visits, and meetings conducted by various members of the design team to discuss climate resilience and other aspects of the PPCR support. A number of NGOs were consulted, including the International Union for Conservation of Nature (IUCN), the World Wildlife Fund for Nature (WWF) and the Wildlife Conservation Society (WCS), especially with regards to their efforts on community-based conservation in the project areas.

Cooperation with the United States Agency for International Development (USAID), UNDP, the Danish International Development Agency (DANIDA), the Cambodia Climate Change Alliance (CCCA), the European Union (EU), and the United Nations Environment Programme (UNEP) at project level, where there are common objectives of developing climate resilience in the communities living in areas of high biodiversity value and vulnerability to climate change, was initiated during project preparation and will continue during implementation through informal meetings as well as through the Strategic Program for Climate Resilience (SPCR) Coordination Team and the CCCA, coordinated by the MOE and the United Nations Development Programme (UNDP). A description of the development coordination is provided in Appendix D to the Board Paper.

19. Implementation Arrangements (incl. procurement of goods and services):

MAFF and MOE will remain the Executing Agencies (EAs) and operate through their respective Central Project Coordinating Unit (CPCU), which will be responsible for the overall implementation of the project. The CPCUs will be responsible for recruitment of consultants; development of pilots and policy work; preparation of detailed designs for each of the interventions; overall supervision of each of the interventions; preparation and monitoring of safeguard measures; financial management, including withdrawal of funds, replenishment of imprest accounts and sub-accounts, disbursements, and reimbursements. The CPCUs will also provide oversight of the management, coordination and supervision of specific sub-project activities that are carried out by their relevant Implementing Agencies (IAs).

The following table shows responsibilities to implement the four interventions in the two provinces, to be undertaken by MOE and/or MAFF as the executing agencies and their relevant IAs. Roles and responsibilities of the EAs and IAs for the PPCR-funded interventions are clearly defined with an implementation arrangement organizational chart provided in the Project Administration Manual (PAM - Appendix B to the Board Paper). Financial management was assessed (Annex 10 to the PAM) with a proposed arrangement shown in a fund flow diagram. Implementation steps for each of the interventions are laid out; and costs by expenditure, intervention, and financier are provided in the PAM.

Intervention	MOE	MAFF
1. Rainwater harvesting ponds for	In community protected	In community forests in

increased climate resilient high value crop productivity	areas in both Koh Kong and Mondulkiri provinces	both Koh Kong and Mondulkiri provinces
2. Climate Resilient Irrigation and Cambodian SRI		In Mondulkiri province only
3. Bioengineered Sea Barriers and Coastal Climate Change Adaptation to Reduce Saltwater Intrusion	In Koh Kong province only	
4. Ecosystem-based adaptation in two pilot catchments	In Mondulkiri province only	In Mondulkiri province only

The National Biodiversity Steering Committee serves as the national steering committee for the project. The NBSC ensures overall coordination and efficient implementation of the Program through strategic guidance and monitoring of program implementation activities; interagency cooperation at national level; review and advice on policy issues and implementation constraints; and integration with other donors and government developmental activities.

Procurement capacity of the EA was assessed and a procurement plan for the PPCR funded activities was developed (Annex 11 and Section VI.D. of the PAM). Procurement will be undertaken by both EAs and where applicable packages managed by each EA were divided in the procurement plan. All significant procurement following international or national competitive bidding and local shopping procedures will be carried out in accordance with ADB's Procurement Guidelines (March 2013, as amended from time to time), ADB's Guideline on the use of Consultants (March 2013, as amended from time to time) and the Government's Standard Operation Procedures. A procurement review committee has been formed to review and approve all procurement action under the BCC Project.

The existing BCC Project implementation consultants' contract will be amended to cover support to the proposed PPCR activities. International and national consultants' inputs will be extended to cover the revised scope of work. This will ensure complete integration of the activities funded by the PPCR into the BCC Project, and improve efficiency of project implementation.

21. Other Information

Public Private Partnerships and Private Sector Participation

The activities funded by PPCR will promote public private partnerships and private sector participation in three areas: (i) cooperation with the NGO sector on community development and training; and (ii) development of a community forest enterprise.

- **Cooperation with the NGO sector on community development and training:** The PPCR project will work with the NGO sector to provide agricultural support services and community development, and aims to build sustainable capacity amongst NGOs with a long-term commitment to Cambodia. NGOs will be invited to bid to support activities under the interventions, and if successful, will be engaged as implementation contractors.
- **Development of a community-based forest enterprise/cooperative.** To strengthen the management of the forest in the buffer zone by the Seima protection forest, a community-based forest enterprise/cooperative will be established to empower the communities in forest protection and sustainable use. This organization is planned at commune-level and includes representatives of all the Forest Conservation Groups, as well as other important local stakeholders. Its primary roles will be to hold the management rights to the forest area, develop and execute forest conservation plans including protection and restoration activities, ensure sustainable use of forest resources as a climate-resilient livelihood option, and share benefits amongst the communities. A contract will be competitively awarded to undertake the work and provide the Forest Stewardship Council certification program.

Stakeholder Consultation and Participation during the preparation of the PPCR activities

Consultations with the communities. Consultations with stakeholders took place during preparation of the PPCR Project, including the conduct of socio-economic surveys and focus group discussions for the feasibility studies of the four interventions. Community members participated in the vulnerability and needs assessment, prioritized their preferred options and assisted the feasibility teams in providing useful insights and local information. They have expressed the wish to participate actively in the Water User Groups. A detailed consultation summary that provides information about the consultation team participants, dates of consultations, and key findings from consultations for each of the proposed four interventions can be found in Appendix 1 of Supplementary Appendices P, Q, R and S of the Board Paper.

Consultations with other stakeholders including government, civil society organizations and development partners. During the preparation of the PPCR Project, coordination and cooperation was achieved through a series of consultation workshops, joint field visits, and meetings conducted by various members of the design team to discuss climate resilience and other aspects of the PPCR support. Different departments within MOE and MAFF, provincial governments of Koh Kong and Mondulhiri, provincial departments of water resources and meteorology, Forestry Administration cantonment, Provincial Protected Area Clusters in the two participating provinces were consulted both in separate meetings and in the formal inception, midterm and final workshops of the project preparation, as well as during the ADB fact finding mission to finalize the design of the PPCR Project. A number of NGOs were consulted, including the International Union for Conservation of Nature (IUCN), the World Wildlife Fund for Nature (WWF) and the Wildlife Conservation Society (WCS). Development partners such as United Nations Development Programme (UNDP), United States Agency for International Development (USAID), the Danish International Development Agency (DANIDA), the Cambodia Climate Change Alliance (CCCA), the European Union (EU), and L'Agence Française de Développement through their projects were also consulted. Their comments and inputs to the PPCR Project, to the extent possible, have been incorporated into the mid-term report

submitted by the project preparation team (available upon request), and finally incorporated into the final design of the PPCR Project.

Resettlement

The PPCR activities were classified as category B for resettlement in accordance with ADB Safeguard Policy Statement 2009. There is no significant involuntary resettlement envisaged since the screening process for interventions will eliminate those with significant resettlement impacts. No land acquisition (voluntary or involuntary) and no physical displacement are expected because the small-scale infrastructure will be improved along existing rights of way and/or existing alignments. Economic displacement is also not anticipated. The following measures will be applied to avoid land acquisition and resettlement: (i) for model interventions that have been identified, avoid all land acquisition at the detailed engineering stage; and (ii) future interventions which require land acquisition will not be eligible for funding. The Resettlement Framework for the ongoing BCC Project has been updated to include the scope of the PPCR activities and will guide mitigation of any insignificant involuntary resettlement impacts when they do occur (Supplementary Appendix J of the Board Paper).

Grievance Redress Mechanism. A grievance redress and resolution mechanism will be established to address affected household's grievances and complaints regarding land acquisition, compensation and resettlement (and other Project related incidents) in a timely and satisfactory manner. All affected households will be made fully aware of their rights, and the detailed procedures for filing grievances and an appeal process will be published through an effective public information campaign. The grievance redress mechanism and appeal procedures will also be explained in the project information booklet that will be distributed to all affected households. The grievance redress mechanism is detailed in the Resettlement Framework, Supplementary Appendix J of the Board Paper).

Indigenous Peoples

The project has been classified as category B for indigenous peoples in accordance with ADB Safeguard Policy Statement 2009. Indigenous Peoples comprise around 30% of project beneficiaries who will have greater food security, climate-resilient livelihoods, increased incomes from home gardens, and lesser vulnerability to climate change. IPs will also be able to legitimately utilize natural resources through community-based forest conservation. However, elite capture may exclude some members of IPs from sharing in project benefits. The draft Indigenous People Development Framework for the ongoing BCC Project has been updated to address these positive and negative impacts (Supplementary Appendix K of the Board Paper). Indigenous People Development Plans have been developed and included in Supplementary Appendices P, Q and S¹⁸.

Environmental safeguards

The activities funded by PPCR were classified as category B for environment in accordance with the ADB Safeguard Policy Statement 2009. The environmental assessment and review framework of the ongoing BCC Project has been updated to include the PPCR activities (Supplementary Appendix I of the Board Paper). In addition, initial environmental examinations of the four PPCR funded interventions have been prepared as part of the feasibility studies, where locations have been identified (Supplementary Appendices P, Q, R, and S).

Information Generation and Knowledge Management

During project implementation, technical specialists including catchment planners and

¹⁸ An indigenous people development plan was not developed for the bioengineered sea barriers intervention where only 3% of the population in the area is indigenous people.

engineers for sea barrier, irrigation and ponds will be engaged to focus on development of relevant knowledge products, including, among others, incorporation of higher risk parameters in infrastructure design due to climate change such as in sea barriers, irrigation and water harvesting ponds. Information generated as a consequence will be analyzed and used in informing infrastructure design which, in itself, will be a knowledge product for replication within and outside the country. An evaluation expert will be engaged specifically to complete case studies and lesson learned report for each subproject. Knowledge products for farmers will also be produced for the introduction of system of rice intensification, saline-resilient crops and drought-resilient crops by the consultants involved in training for these activities. Case study and policy workshops are planned to share experiences and lessons learnt from implementing different interventions in a catchment context. The total budget for knowledge products and knowledge management is estimated at \$195,000 and will be one of the outputs of the implementation contracts.

Stock taking meetings will be held regularly with the communities to ensure constant learning. Knowledge products for farmers will be produced as part of the training program. The website to be developed for the ongoing BCC Project will include information on the PPCR funded interventions in Khmer and in English for wider dissemination of information and knowledge generated from the Project, and to provide a feedback mechanism.

Furthermore, as the BCC Project is part of a Greater Mekong Subregion Project in Cambodia, Lao PDR and Viet Nam, the existing mechanism to ensure regional cooperation and learning which includes one meeting a year, possibly exchange site visits, and other regular events between project implementers in the three countries will be used also for the PPCR funded interventions. Both the projects in Lao PDR and Viet Nam have climate change mitigation and adaptation aspects and information exchange will be supported by the ongoing BCC Project.

Gender Dimensions

The PPCR interventions are classified as effective gender mainstreaming. They support women farmers' in accessing economic resources and provide opportunities for women's participation and voice in community water resources management. The PPCT interventions will also provide women in the target communities with improved infrastructure that will help to reduce work burdens. A gender action plan (Supplementary Appendix H of the Board Paper) has been developed and include the following targets:

- (i) 80% women trainees on training on nutrition, selection of crops for family nutrition and livelihood (cash crops), and on techniques to improve productivity and water conservation;
- (ii) 40% women trainees on Cambodian SRI, model trainers and members of seed production groups;
- (iii) 50% women involved in mangrove planting;
- (iv) 25-30% women farmers for "demonstration plots" for saline resilient crop varieties and production techniques;
- (v) 30% women in management positions in forest conservation groups and WUGs; and
- (vi) 30% of WUGs women members to be trained in operation and maintenance.

Monitoring, Evaluation and Reporting

Performance Monitoring: The PPCR core indicators as reflected in section 15 of this document - Main Interventions and Indicators for Success- have been incorporated into the Design and Monitoring Framework of the ongoing BCC Project (Appendix to the Board Paper). The M&E system for these indicators will follow the same system that has been set up for the ongoing BCC Project. A Project Performance Monitoring System (PPMS) has been developed for the BCC project to record the project's technical performance, assess achievement of the

project's objectives and measure the social, economic, financial and institutional impacts. The CPCUs will be responsible for developing and operating the PPMS with assistance from the Grant Implementation Consultants, and will report quarterly to ADB. Progress monitoring, safeguard monitoring and benefit monitoring and evaluation will be carried out regularly during program implementation. Post-evaluation will be carried out three years after project completion. A baseline survey covering both target and control groups, and periodic surveys will be carried out by collecting data disaggregated by income group, sex, and other characteristics as appropriate. The PPCR Results Framework and PPCR Monitoring and Reporting Toolkit are included in Annex 13 to the PAM to ensure that the PPCR M&R requirements are fully complied with. The CPCUs with support from the Grant Implementation Consultants will coordinate with the team of Technical Assistance (TA) 8179: *Mainstreaming Climate Resilience into Development Planning* for Cambodia funded under the PPCR on monitoring and reporting to ensure synergy and consistency.

Compliance Monitoring: A number of assurances have been given by the government to ensure the smooth implementation of the PPCR interventions. These will be subject to Grant covenants. The ADB will monitor compliance with those covenants throughout project effectiveness and implementation via regular review missions, quarterly progress reports submitted by the CPCUs, and review of project accounts and procurement procedures. ADB will conduct regular (twice per year) reviews throughout project implementation to review and assess implementation performance and achievement of project outcomes and objectives; examine financial progress; and identify issues and constraints affecting the project and work out time-bound action plans for their resolution.

Reporting. Quarterly progress reports will be submitted to MEF and ADB within 30 days of the end of each calendar quarter. Based on inputs provided by the PPMUs and CPCU-MOE, the CPCU- MAFF will consolidate quarterly progress reports in a format consistent with ADB's project performance reporting system, allowing ADB staff to readily capture key information to record in ADB's project reporting system. In addition to these quarterly progress reports, based on inputs provided by the PPMUs and CPCU-MOE, the CPCU- MAFF will prepare consolidated annual reports, which will include (i) progress achieved by output as measured through the indicator's performance targets, (ii) key implementation issues and solutions; (iii) an updated procurement plan; and (iv) an updated implementation plan for the next 12 months. To ensure the project continues to be both viable and sustainable, project accounts and the EAs annual financial statements, together with the associated auditor's report, should be adequately reviewed. Within six months of physical completion of the BCC Project including the PPCR Additional Financing, the CPCUs represented by MAFF with input from MOE will submit to ADB a completion report that describes the physical achievements of the Program, actual costs incurred in relation to cost estimates, the results of program activities, a preliminary assessment of achieved benefits, and other relevant program implementation matters requested by ADB.

Economic and Financial Analysis. Four representative investments were examined in an economic and financial analysis (Supplementary Appendix E of the Board Paper), including: (i) forest border irrigation and climate resilient rice production; (ii) rainwater harvesting and climate resilient home garden; (iii) ecosystem-based adaptation in two catchments ; and (iv) bioengineered sea barriers. Economic analysis of these investments generated economic internal rates of return in the range of 15.5-17.1% based on benefits that are readily quantifiable, compared to the threshold of 12%. Sensitivity analysis indicated that none of the risk factors appeared to place these interventions' economic viability in immediate jeopardy. Financial analysis indicated that household income (as measured by return to land and labor) would significantly increase as compared with the income levels in the without-project scenario due to increased cropping intensity and yields of existing crops and adoption of higher value

vegetable and fruit crops. On average, household income increment is in the range of 54-120% of the level in the without project scenario. This suggests that the proposed interventions will be essential in diversifying household livelihoods and income and hence reducing poverty. The PPCR interventions are also expected to generate significant social benefits that accrue to communities, local governments, and private and nongovernment organizations through stakeholder empowerment resulting from the institutional and capacity-building interventions. However, these benefits are not readily quantifiable.