

PILOT PROGRAM FOR CLIMATE RESILIENCE
Summary - Project/Program Approval Request

1. Country/Region:	Cambodia/ Asia	2. CIF Project ID#:	(Trustee will assign ID)
3. Project/Program Title:	Cambodia: GMS Southern Economic Corridor Towns Development Project ¹		
4. Type of PPCR Investment	Private:	Public:100%	Mixed:
5. Funding Request (in USDmillion total) for Project/Program:	Grant: \$4.4 million		Loan: \$5 million
6. Approved Preparation Grant	Amount (USD): \$600,000		Date: 29 June 2011
7. Implementing MDB:	Asian Development Bank		
8. Other MDB Involvement	MDB: None		Type of Involvement: None
9. National Project Focal Point:	Ministry of Public Works and Transport (MPWT), with an administrative oversight from Ministry of Economy and Finance (MEF) and National Climate Change Committee (NCCC)		
10. National Implementing Agencies for project/program:	The Provincial Departments of Public Works and Transport (PDPWT) in Svay Rieng, Banteay Meanchay, Battambang, and Prey Veng Provinces		
11. MDB PPCR Focal Point and Project/Program Task Team Leader (TTL):	Headquarters-PPCR Focal Point: Charles Rodgers crodgers@adb.org		TTL: Florian Steinberg fsteinberg@adb.org

12. Project/Program Description:

The project is designed to enhance the competitiveness of towns along the Southern Economic Corridor (SEC). The project will transform the corridor towns of Battambang, Bavet, Neak Loeung, and Poipet in Cambodia into economic hubs by improving urban-environmental infrastructure and strengthening institutional capacities of provincial and local authorities. The productivity of economic enterprises in these towns will be significantly improved since there will be increased climate resilience through flood control measures.

Special Features with regard to Climate Resilience: The project has two special features:

- The project supports climate resilience of towns through adaptation initiatives aimed to reduce the adverse impact of climate risk on infrastructure investment, with cofinancing from the Strategic Climate Fund under its Pilot Program for Climate Resilience (PPCR). It supports five subprojects with clearly defined climate resilience investments, namely (i) Battambang Wastewater Treatment; (ii) Battambang Flood Control; (iii) Bavet Wastewater Treatment; (iv) Neak Loeung Flood Protection; and (v) Poipet Wastewater Treatment.
- The project supports decentralization of urban infrastructure and agencies to the local level and their capacity building to manage and maintain urban infrastructure, enhance climate resilience and ensure sustainability.

¹ Formerly known as 'Component III: Improving Climate-Resilient Infrastructure Project 2: Climate Proofing Infrastructure in the Southern Economic Corridor (SEC) towns', as part of ADB-funded GMS Corridor Towns Development Project.

- The project represents a blending of ADB's concessionary Asian Development Fund (ADF) resources with PPCR funding to enhance climate resilience.

Sectors: Water supply and other municipal infrastructure and services – water supply and sanitation, urban sector development, and waste management.

Themes: Economic growth (widening access to markets and economic opportunities), environmental sustainability (urban environmental improvement), regional cooperation and integration (trade and investments), and capacity development (institutional development).

The priority subprojects were selected based on criteria such as (i) consistency with the project's overall goals and objectives; (ii) potential impact in contributing to economic growth and level of competitiveness; and (iii) the expressed interest and commitment of the executing agency to provide necessary resources in support of enhanced climate resilience.

The PPCR-funded subprojects of the project will enhance climate resilience of the towns by ensuring safe and climate-resilient infrastructure providing all-year access and services by protecting the roads, wastewater systems, flood control systems, and other infrastructure from the impacts of climate change and climate variability, and piloting adaptation measures to protect the wastewater and flood protection facilities against long-term risks posed by climate change. Through its capacity development measures, the project will improve the project management capacity of the local implementing agencies (IAs) to manage and maintain the subprojects in a sustainable manner.

On Cooperation/Coordination:

- During project formulation coordination and cooperation has been done with institutions involved in climate resilience initiatives, particular is the Mekong River Commission (MRC). Studies from other GMS projects on climate resilience also supplemented the project preparation such as those prepared under the Cities Development Initiatives for Asia (CDIA).
- During project implementation, it is expected that there will be consultations with local experts (i.e. academe, professional organizations) in the process of preparing the detailed engineering designs of the subprojects, to ensure that the appropriate design parameters and specifications (i.e. design flood level, local available materials) are properly integrated.
- Cooperation with World Bank (WB) at project level is not possible sought this time, as WB currently does not have any existing urban sector project portfolio in the proposed towns. On the other hand, possible synergies with urban development programs from other donors like the German GIZ and KfW in Cambodia will be explored².

On Participation:

- During project formulation, various consultation workshops and activities were done with the project stakeholders. These include household surveys for the preparation of the Project's Poverty and Social Analysis (PSA), consultation workshops for the preparation of Strategic Local Economic Development Plans (SLEDPs), conduct of Key Informant Interviews (KIIs) and focus group discussions (FGDs) for safeguards assessment and monitoring and evaluation, and discussion and validation of indicators used in the Design and Monitoring Framework (DMF).
- During project implementation, consultations will be done with project beneficiaries (including women and private sector) to ensure that all concerns related to previous impacts of flooding and disasters can be addressed by the climate resilience measures in the design of the structures.

² Among the interventions on climate resilience and urban development in the GMS supported by GIZ which may be synergized with this project include the Climate Change and Adaptation Initiative program and the Flood Management and Mitigation Program, both implemented by the Mekong River Commission.

- Other participatory methods during project implementation will also be considered like establishing venues for exchange of information. One such strategy is putting up of a billboard/project information board (or an exhibition) in a suitable area(s) within a specified period of time, with a description of the project and how it will help solve the problem of perennial flooding. A suggestion/comment box for the people to place their insights on the project will also be placed at the place of exhibition. This will generate inputs through community/stakeholder responses on the project design as it pertains to climate resilience. Other considerations for integrating economic activities, especially in the case of the river embankment subprojects, may also be generated through this exercise.

On Gender:

- During project formulation, consultative meetings and FGDs were conducted with women's groups in each town. These meetings were able to generate perceptions on the impacts of the proposed subprojects on their well-being including impacts of climate change to their daily activities.
- During project implementation, the involvement of women stakeholders (i.e. traders, housewives) will be sought in the planning and design through participation/consultation methodologies, particularly in areas affected by perennial flooding. This will also make them aware that their social and economic activities will no longer be interrupted in the future due to the enhanced flood protection investments, and that they are assured of a sustainably healthy and clean environment with a climate proofed wastewater treatment system.
- Another possible gender action is the involvement of local women technical professionals and "women in government" in cooperation/coordination activities with local experts in the preparation of the detailed engineering designs. This will also enable them to gain additional technical know-how on incorporating climate-proofing measures for infrastructures.
- The Gender Action Plan (GAP) shall be a priority reference document in the implementation of the infrastructure investments to ensure that relevant gender issues identified during the PPTA are addressed. Among the proposed actions and targets in the GAP that should be ensured are: (i) training for women (at least 500 per towns) to better position their entry in growing employment demands arising from project interventions such as construction; (ii) employment of 30% female workers during the construction phase; (iii) conduct of school awareness campaigns; and (iv) ensure that at least 30% of the composition of project management and implementation units are female. These GAP actions will enable women and girls not just to gain new employment and career development opportunities, but also gain knowledge on the aspects of climate change and climate resilience.

On Learning:

- The project preparation has been supplemented by good practices and examples from the technical assistance provided by the German Development Service (DED) in the preparation of the Technical Report for Battambang Land Use Plan. The Report provided guidelines for the long term spatial development taking into consideration anticipated growth of urban areas as a result of improved trade and traffic along the transport corridors. Lessons learned from the ADB-GTZ-supported Cities Development Initiative for Asia (CDIA) report on Pre-feasibility Study for Urban Environment Infrastructure Improvement Project in Battambang contributed substantive insights in terms of future infrastructure demands. The ADB Urban Sector Assessment, Strategy and Roadmap provided relevant inputs on urban development and physical conditions and trends of essential urban infrastructure including the good practices on community based environmental projects with strategic investment linked to capacity building of core institutions in Cambodia.
- Best practices and learning experiences will also be drawn from other ADB projects and joint multi-lateral initiatives like the Clean Air Initiatives for Asian Cities (CAI-Asia) which can be used to give the stakeholders a better understanding about integrating climate resilience into policy making, and planning infrastructure investments for climate change adaptation.

- During project implementation, There will be two consultancy packages to support the project activities - one for Project Implementation Support and another for Capacity Development and Training to support the capacity building and training activities of the project. Several trainings that will be supported with a given focus on knowledge management, among these are: Training on Website Management, which will involve developing an on-line information resource on the Project's accomplishments; Training on Data Generation, which will involve training on collection and analysis of data for producing information databases which can be used to produce project-related publications besides monitoring purposes; and Training on Climate Resilience Measures, which will involve knowledge sharing exchanges and experiential sharing on adaptation measures appropriate to the context of Cambodia and the GMS.
- The project will be implemented in parallel with a Nordic Development Fund (NDF) supported TA – Climate Resilience in GMS Cities, which is piggy-backed to the Southern Economic Corridor Towns Development Project (SECTDP), and is focused on building capacities of GMS secondary towns and cities on climate resilience. This SECTDP's outputs and pilot initiatives will also serve as a benchmark or lesson for this NDF-supported TA in enhancing the climate resilience of GMS towns and cities.

Summary of Climate Resilience Measures under the Project:

Climate Change and Urbanization of Secondary Towns in Cambodia:

According to the latest technical assessment, Cambodia's temperature has been rising steadily over the past 50 years. The average temperature has increased since 1960 by 0.8°C, and the frequency of unusually hot days and nights has increased. A further 0.3-0.6°C increase is expected by 2025, and some studies suggest temperatures may increase from 0.7°C to 2.7°C by the 2060s. All climate change models agree that average rainfall in Cambodia will increase, but the magnitude of change is uncertain. Estimates of the increase vary from as little as 3 % to as much as 35 % by the year 2100³. Mean annual rainfall is predicted to increase, with the most significant increase in the wet season. In contrast, water flows in the dry season are predicted to decrease.

Cambodia's National Adaptation Program of Action to Climate Change (NAPA), 2006, has identified the provinces of Battambang (location of Battambang town) and Banteay Meanchey (location of Poipet town) as vulnerable to floods. The province of Prey Veng (location of Neak Loeung) is indicated as the most vulnerable to flooding among the provinces of Cambodia. The province of Svay Reing (location of Bavet town) is identified as "quite" vulnerable to flooding. Historical data on the occurrence of natural disasters in Cambodia from 1991 to 2002 showed that the provinces of Battambang and Prey Veng have experienced severe flooding in the years 1991 and 1997 that affected a total of 1.95 million people. The town of Battambang has experienced perennial flooding to as high as 0.5 meters in certain areas lasting between 2 to 7 days. The 363-hectare area covered by the Project in the town of Neak Loeung has experienced perennial flooding lasting for several days affecting 7,418 inhabitants in the area. Although no data on the specific number of days were recorded on the occurrence of flood in the town, during the preparation of the feasibility study for the Flood Protection Subproject, the survey team arrived on the site flooded and it took about three weeks for the flood water to subside. About 30% of town of Poipet experience perennial flooding lasting up to 15 days. The town of Bavet rarely gets flooded as dikes were established as part of the town's drainage system⁴.

The worldwide phenomenon of urbanization is expected to cause more climate change impacts with the expansion of the built environment causing an increase in urban heat islands and surface water run offs with the decreasing areas of pervious surfaces to absorb rainwater. These urban heat islands create micro-climate conditions in urbanized cities that cause warmer temperatures and burst of heavy rains called "cloudbursts" where the accumulated heat of a city's built environment produces an extreme amount of precipitation which lasts from a couple of minutes to a few hours, and are capable of creating floods.

³ Source: Asian Development Bank. 2011. *Strategic Program for Climate Resilience (SPCR), prepared for the Pilot Program for Climate Resilience, Royal Government of Cambodia.* Manila.

The secondary towns of Battambang, Bavet, Neak Loeung and Poipet are undergoing a process of urbanization which is expected to accelerate with the increasing trade and traffic flows in the GMS Southern Economic Corridor (SEC). The inability of the carrying capacity of the present storm drainage systems coupled with future climatic events such as increased precipitation during the rainy season and possible occurrence of cloudbursts due to increased urban heat islands in these towns would cause sudden heavy rainfall which if not foreseen in the design and construction of urban infrastructures would lead to severe flooding in just a short time causing physical and economic losses. In addition, the absence of allowances for climate resilience measures for flooding in other urban infrastructure such as flood control and wastewater treatment would also cause these facilities to discontinue their operation and/or function and would hamper the services they are supposed to render to the local inhabitants. The climate resilience measures of the proposed infrastructure investments under the SECTDP, which are to be funded through the PPCR are intended to ensure resilience against these possible future climate related events.

Detailed Engineering Design aspects:

The main measures for climate resilience of urban infrastructure is to ensure that they are secure against flooding due to future increase of flood levels. The following criteria were used in conceptualizing the climate resilience measures for the infrastructure investments under the project:

- An average precipitation increase of 5% up to 2050 (this is still a low estimate based on NAPA and MRC projections).
- An increase of annual peak flows in Mekong between Phnom Penh and Neak Loeung of at least 5% up to 2050 (no change during the wet season and 20-40 % increase during the dry season).
- Changes to the water level at individual locations have to be estimated based on local conditions

The factors considered in design adjustments include cost-effectiveness, current climate variability and potential future risk⁵. A margin of safety risk as an extra height on the freeboard will be applied in the design of the structures. The freeboard is an additional height to be added to the structure from the top of the projected design flood level (water level at the 50-year return period plus the possible additional water level height due to the 5% increase in precipitation) to the top of the structure. The additional freeboard will be 30 to 50 cm (please see Section 15 for description of freeboard range for each subproject), which is proposed is a realistic safety margin at the concept stage. These climate resilience design features are based on the suggested measures by the World Roads Association⁶. These design measures are intended to address the anticipated impacts of future flood scenarios to protect life and property, and thereby rid or reduce government budget re-alignments to help finance un-programmed post-disaster rehabilitation activities. This fiscal benefit will enable both lawmakers and local engineers to appreciate such measures.

Recommended Design Standards and Guidelines:

In the preparation of the detailed engineering designs, applicable national building codes and standards and international standards shall be followed in the design of the civil works. Provided that national building codes lack the necessary standards for coming up with climate resilient designed infrastructures, international standards shall be used.

⁴ Source: 2012. ADB. *Corridor Towns Development Project, Linked Document G – Guidelines for Climate Proofing Infrastructure*. Manila (TA-7644 REG).

⁵ Source: 2012. ADB. *Corridor Towns Development Project, Linked Document G – Guidelines for Climate Proofing Infrastructure*. Manila (TA-7644 REG).

⁶ Adaptation measures suggested by the World Roads Association are: (a) applying a safety factor; (b) considering a longer return period for exceptional events when designing hydraulic structures; (c) considering storm water volumes over a longer period; (d) reducing the gradients of slopes and taking into account the materials used; (e) protecting the base of fills and discharge structures; (f) enclosing the materials; (g) using waterproof materials or treat them to make them so; (h) checking the condition of slopes regularly; (i) regularly checking the condition and function of the drainage system and hydraulic structures; and, (j) improving the implementation of alternative routes in the event of a road closure.

These standards include guidelines and laws on the design of road drainage systems, riprap structures for flood control, guidelines for estimating water flows in water bodies, land use considerations, and standards for water pollution control and design of wastewater treatment facilities. Discussed below are the recommended standards and guidelines to be used as reference for each subproject as stated in the feasibility studies.

1. *Battambang, Bavet, and Poipet Wastewater Treatment Subprojects.* The main consideration in the design of the wastewater treatment system is the *Sub-decree on Water Pollution Control*, 1999 issued by the government of the Kingdom of Cambodia. This will guide the preparation of the final design of the treatment process based on the existing quality of the town's wastewater and the effluent standards of the sub-decree (i.e. pH, BOD, DO). In addition, other applicable guidelines like the *Highway Drainage Guidelines of the American Association of State Highway and Transportation Officials (AASHTO)* will also be used as a reference in the design of the separate storm drainage systems under the three subprojects. Recommended freeboard ranges prescribed are based on the criteria set by the *World Roads Organization*.
2. *Battambang Flood Control and Neak Loeung Flood Protection Subprojects.* Recommended standards and guidelines include those for the design of riprap structures for flood control such as the *Hydraulics Engineering Circular No. 11 - Guideline for Riprap: Design of Riprap Revetment published by the Federal Highway Administration* by the U.S. Department of Transportation, and the *Guide for Dimensioning of Riprap*, 2009 by the Norwegian Water Resources and Energy Directorate. Other standards and guidelines include those on assessing project location and appropriate measures with respect to land use and location (i.e. *Flooding and Danger of Landslide in Plans for Land Use*, 2011 by the Norwegian Water Resources and Energy Directorate), and guidelines for flow calculations of surface water bodies which will be used as reference for designing the resilience features of the flood control structures to varying water flow volumes and velocities to prevent them from eroding (i.e. *Guideline on Flow Calculations*, 2011 by the Norwegian Water Resources and Energy Directorate). Recommended freeboard ranges prescribed are based on the criteria set by the *World Roads Organization*.

The design flood level for each subproject will be verified during the preparation of the detailed engineering designs where in-depth analysis of actual site conditions will be done to determine the most appropriate structural requirements that will make the subprojects climate resilient. It is expected that these interventions for making climate resilient urban infrastructure will eventually lead to adoption of such measures in designing future public infrastructures and possible integration into the building codes and standards of Cambodia and is expected to positively impact the socio-economic conditions of the benefitting communities. Taking the case of Neak Loeung where the town's rate of urban expansion is considered as a positive development. The proposed flood protection measures will help this town to grow and to become more relevant as the land will become safe from flooding, will likewise increase in value, making it suitable for urbanization. Since the location of the town at the shore of the Mekong is a given fact, urban development measures need to address how to mitigate and ultimately eliminate flooding and climate impacts. In this regard, PPCR is supporting the strategic transformation of Neak Loeung, and this transformation means that it will stimulate urbanization and growth of the town beyond its current possibilities. Thus the proposed intervention is relevant beyond climate "proofing" since it increases the buildable urban land and offers new investment opportunities in land development which did not exist prior to the project.

As of this time, a longer flood scenario would entail additional measures which would increase the project cost and would not be financially feasible. This has been evaluated during the preparation of the feasibility studies of the proposed subprojects, and the aforementioned proposed measures are found to be the most cost-effective. A team of consultants was also mobilized during the feasibility stage using \$600,000 from the PPCR budget to ensure that climate resilience measures are considered in the designs of the subprojects and that the most cost-effective measures will be incorporated so as not to detriment the financial and economic viability of each subproject.

Description of Subprojects:

The five subprojects to be co-financed by PPCR with a summary of their basic infrastructure components and funding source allocations are provided below⁷.

1. Battambang Flood Control⁸

- Total estimated cost is \$2.28 million to be funded by ADF - \$1.37 million, PPCR - \$0.65 million, and Government equity - \$0.27 million.
- A 200 m (L) x 30 m (W) structure will be built in Wat Sophy Sangkat, and a 100 m (L) x 30 m (W) structure in Svay Por Sangkat. These structures up to the design flood level will be funded through the ADF loan from ADB. The PPCR funding of \$0.65 million will be used to finance the construction of the additional 50 cm. freeboard height from the top of the design flood level height as a climate resilience measure, including consulting services, and training on the management and maintenance of these structures for the stakeholders.

2. Battambang Wastewater Treatment⁹

- Total cost is estimated to be \$16.41 million to be funded by ADF - \$10.25 million, PPCR - \$3.53 million, and Government equity - \$2.63 million.
- This will involve the rehabilitation of an existing plant (eastern part of towns) and construction of a new wastewater treatment facility (western part of town), construction of a total of 60.7 km. of separate storm drainage canals, 62.8 km of sewage piping network, lift/pump stations, and rehabilitation of existing open canals to be funded through the ADF loan.
- The PPCR funding of \$3.53 million will be used for providing surge prevention systems for manholes and overflow chambers, erosion protections structures for 6.36 km of storm drainage network, additional 50 cm freeboard height for the four pump/lift stations, and 4000 m perimeter flood protection barrier dike for the two WWTPs as a climate resilience measures, including consulting services, and training on the management and maintenance of these structures for the stakeholders

3. Bavet Wastewater Treatment¹⁰

- Total estimated cost is \$3.56 million to be funded by ADF - \$2.18 million, PPCR - \$1.03 million, and Government equity - \$0.36 million.
- The subproject will involve the construction of a separate sewage interceptors and pipelines, and a new WWTP, upgrading of storm drainage structures which will involve the construction of 3.28 km of open concrete canals, and 1.5 km of closed storm drainage canals from the town center to the catchment area, which will be funded by the ADF loan.
- The PPCR funding of \$1.03 million will be used for providing surge prevention systems for manholes and overflow chambers, erosion protections structures for 60.7 km of storm drainage network, additional 30 cm. freeboard height for the nine pump/lift stations, and 3600 m perimeter flood protection barrier for the WWTP as a climate resilience measures, including consulting services, and training on the management and maintenance of these structures for the stakeholders

4. Neak Loeng Flood Protection¹¹.

- Total estimated cost is \$4.56 million to be funded by ADF - \$2.61 million, PPCR - \$1.23 million, and Government equity - \$0.72 million.
- The subproject will involve the construction of a 4.5 km perimeter dike-cum road to be funded by the ADF loan.
- The PPCR funding of \$1.23 million will be used to finance the construction of the additional 50 cm freeboard height from the top of the design flood level height as a climate resilience measure, including consulting services, and training on the management and maintenance of these structures for the stakeholders.

⁷ The indicated costs and financing excludes contingency.

5. Poipet Wastewater Treatment¹².

- Total estimated cost is \$4.31 million to be funded by ADF - \$2.60 million, PPCR - \$1.23 million, and Government equity - \$0.49 million.
- The subproject will improve and upgrade 6 km of storm water drainage canals from the town center to the catchment area at the WWTP, construction of 26 km of separate sewage pipes and lift stations, new WWTP, and upgrading of WWTP access road. These components will be funded by the ADF loan.
- The PPCR funding of \$1.23 million will be used for providing surge prevention systems for manholes and overflow chambers, erosion protection structures for 6 km of storm drainage network, additional 50 cm freeboard height for one pump/lift station, and 4000 m perimeter flood protection barrier for the WWTP as a climate resilience measure, including consulting services, and training on the management and maintenance of these structures for the stakeholders.

Construction Methodologies and Materials. Construction methods such as the use of tested local materials shall be used to ensure cost effectiveness. Further study will be done to identify areas where appropriate local materials can be sourced. Erosion prevention methods in the construction of dikes and flood protection systems shall also be applied. The construction of drainage systems according to the detailed engineering designs and technical specifications will also be closely monitored.

13. Objective

The objective of the project is to enhance the climate resilience of the towns of Battambang, Bavet, Neak Loeung, and Poipet to become centers of economic activity in the SEC through enhanced resilience or urban infrastructure and enhance capacities at local levels. By becoming climate resilient and economically consolidated, these towns will contribute to the transformation of transport corridors to economic corridors within the GMS. The environmental infrastructure investments and capacity building activities will enhance accessibility and climate resilience of each town/city.

14. Expected Outcomes:

The expected outcome is enhanced climate resilience through improved urban infrastructure.

Construction of climate-resilient infrastructure will have multiple impacts:

- **Wastewater treatment plants.** Safe, cost-effective, year-round operational, and flood resilient wastewater systems, with treatment plants and upgraded or newly constructed storm drainage systems in Battambang, Bavet, and Poipet. Flood free facilities will help to increase public health levels, and environmental quality of towns; and
- **Flood dikes.** Areas protected against flooding and erosion, and safe access through the flood control projects in Battambang and Neak Loeung. Battambang's city centre will become a safer place to do business and reside in.

Enhanced institutional and technical capacities for mainstreaming climate resilience, in project implementation, operation and maintenance.

- Efficient project management support to the EA during project implementation; and
- Capacity building for facilities maintenance and asset management of climate resilient infrastructure.

15. Key Results and Indicators for Success (consistent with PPCR results framework):

Result	Indicator
1. Climate resilient and improved	<ul style="list-style-type: none">• Urban areas affected by perennial flooding reduced by up to 30%

⁸ ADB. 2012. *Feasibility Study, Battambang Flood Control Subproject*. Manila (TA 7644-REG).

⁹ ADB. 2012. *Feasibility Study, Battambang Wastewater Treatment Subproject*. Manila (TA 7644-REG).

¹⁰ ADB. 2012. *Feasibility Study, Bavet Wastewater Treatment Subproject*. Manila (TA 7644-REG).

¹¹ ADB. 2012. *Feasibility Study, Neak Loeung Flood Protection Subproject*. Manila (TA 7644-REG).

¹² ADB. 2012. *Feasibility Study, Poipet Wastewater Treatment Subproject*. Manila (TA 7644-REG).

<p>environmental infrastructure in the towns of Battambang, Bavet, Neak Loeung, and Poipet ensuring year-round accessibility for economic and residential activities.</p>	<p>by 2018 (Indirect beneficiaries are the three Sangkats in Battambang which will benefit 5,956 of its 51,476 inhabitants, and in Neak Loeung where 7,418 of its 24,726 inhabitants are residing in the 363-ha project area). The impact of the subproject will be that the population will increase rapidly as the land will become attractive for building.</p> <ul style="list-style-type: none"> • A total of 526,000 inhabitants of the four towns have benefitted from the improved services and impacts of climate resilience measures of the subprojects by 2018. • Flood-affected persons in Battambang and Neak Loeung reduced by 15,120 persons (= 30%) of regularly affected population (50,400 = 30%) by 2023. • No interruption of economic activities. GDP shares of various economic activities in the four towns have increased by 2023: trade services from 8.4% in 2007 to 18.4%; hotels, restaurants and other tourism services from 4.3% in 2007 to 14.3%; and transportation and communication services from 6.9% in 2007 to 16.9%.
<p>2. Intergation Climate Resilience in Strategic Local Economic Development Plans (SLEDPs) in Battambang, Bavet, Neak Loeung, and Poipet.</p>	<ul style="list-style-type: none"> • Climate resilience measures reflected in four SLEDPs. SLEDPs adopted by the local governments by 2014.
<p>3. Climate-resilient urban infrastructure investments implemented and completed in Battambang, Bavet, Neak Loeung and Poipet¹³.</p>	<p>By 2016:</p> <ul style="list-style-type: none"> • Battambang Flood Control Subproject. <ul style="list-style-type: none"> - A 200 m (L) x 30 m (W) river embankment and flood control structure in Wat Sophy in Rottanak Sangkat built with an additional freeboard of 50 cm. from the top of the design flood level to the top of the dike as a climate resilience measure. - A 100 m (L) x 30 m (W) river embankment and flood control structure in Svay Por Sangkat built with an additional freeboard height of 50 cm from the top of the design flood level to the top of the dike as a climate resilience measure. • Battambang Wastewater Treatment Subproject. <ul style="list-style-type: none"> - Storm drainage canals constructed in Rottanak and Preah Preah Sdach Sangkats with manholes and overflow chambers constructed with <i>Surge Prevention Systems</i> to prevent storm water backflow into the settlement areas. - 60.7 km of erosion protection structures built to protect the drainage canals from damages. - 50 cm additional freeboard height based on design flood level built/added for the four lift and pump station structures. - 4000 m of perimeter flood protection barrier structure built for the WWTP incorporating a 50 cm additional freeboard height based on the design flood level in the area. • Bavet Wastewater Treatment Subproject. <ul style="list-style-type: none"> - Storm drainage manholes and overflow chambers constructed

¹³ Additional freeboard design height determined based on historical flooding in each town, with Bavet the only town with consideration for a 30 cm freeboard height being a less vulnerable town to flooding.

	<p>with <i>Surge Prevention Systems</i> to prevent storm water backflow into the settlement areas.</p> <ul style="list-style-type: none"> - 6.36 km of erosion protection structures built to protect the storm drainage canals from damages. - 30 cm additional freeboard height based on design flood level built/added for the nine lift and pump station structures. - 3600 m of perimeter flood protection barrier structure built for the WWTP incorporating a 30 cm additional freeboard height based on the design flood level in the area. <ul style="list-style-type: none"> • Neak Loeung Flood Protection Subproject <ul style="list-style-type: none"> - 4.5 km of river embankment constructed in the east side of Neak Loeung along the Mekong River built with an additional freeboard height of 50 cm from the top of the design flood level to the top of the dike as a climate resilience measure. • Poipet Wastewater Treatment Subproject. <ul style="list-style-type: none"> - Storm drainage manholes and overflow chambers constructed with <i>Surge Prevention Systems</i> to prevent storm water backflow into the settlement areas. - 6 km of erosion protection structures built to protect the closed storm drainage canals from damages. - 50 cm additional freeboard height based on design flood level built/added for one lift and pump station structure. - 4000 m of perimeter flood protection barrier structure built for the WWTP incorporating a 50 cm additional freeboard height based on the design flood level in the area.
<p>4. Enhanced institutional and technical capacities of government officials at the national, provincial and district/town levels for managing, implementing, operating and maintaining climate resilient infrastructures.</p>	<ul style="list-style-type: none"> • Capacity and training needs assessment and capacity development plan completed by Q3 of 2013 • Public awareness and information campaign program completed by Q2 of 2014 • Preparation of 36 capacity building modules and training manuals for project management, procurement, disbursement, operation and maintenance, and monitoring and evaluation completed by Q2 of 2014. • Thirty-six seminar-workshops and on-the-job training sessions on the management, implementation, operation and maintenance of climate resilient infrastructures conducted between 2014 to 2016 in Battambang, Bavet, Neak Loeung and Poipet. • Two thousand persons trained in project management and implementation, and operation and maintenance of climate resilient infrastructures by 2016. • Five MOAs between IAs and District/Town authorities on the operation and maintenance of the climate resilient infrastructures signed by 2016.
<p>16. Budget:</p>	
<p>Expenditures¹⁴</p>	<p>Amount (USD) – estimates (\$'000)</p>
<p>1. Civil works</p> <ul style="list-style-type: none"> • Battambang Flood Control 	<p style="text-align: right;">7.66</p> <p style="text-align: right;">0.65</p>

¹⁴ Expenditure categories should be provided by the MDBs based on own procedures.

<ul style="list-style-type: none"> • Battambang Wastewater • Bavet Wastewater • Neak Loeung Flood Protection • Poipet Wastewater 		3.53
		1.03
		1.23
		1.23
2. Consultants		
i. International consultants		0.24
ii. National consultants		0.06
3. International and local travel		
4. Reports and Communications		0.10
5. Equipment¹⁵		
6. Training, Workshops, Seminars, Meetings and Conferences ¹⁶		0.09
7. Urban infrastructure resource center ¹⁷		0.26
8. Miscellaneous Administration and Support Costs ¹⁸		0.13
9. Contract Negotiations		
10. Contingencies ¹⁹		0.85
11. Service Charge ²⁰		0.01
Total Cost		\$ 9.40 million
Co-Financing²¹:	Amount (USD million):	Type of contribution:
Government	\$5.22 million \$1.65 million	Taxes and duties Involuntary resettlement and land acquisition
MDB	\$37.00 million	Loan
Others: Urban Environmental Infrastructure Fund (UEIF) of ADB	\$1.50 million	Grant
Co-Financing Total	\$45.37 million	
Grand Total	\$54.77 million	
17. Project/Program Timeframe		
Expected Board/MDB Management approval date: November 2012		
Expected Mid-Term review date: January 2016		
Expected Project/Program closure date: December 2018		
18. Role of other Partners involved in project/program²²: --		
19. Implementation Arrangements (incl. procurement of goods and services):		
The loan investment project will be implemented for 6 years from 1 January 2013 to 31 December 2018. The executing agency (EA) for this project is the Ministry of Public Works and Transport (MPWT). The		

¹⁵ Includes the cost of computers, printers and geographic information system software; All items procured under the TA will be turned over to EA upon TA completion.

¹⁶ Includes participation to local and regional climate change related events for information exchanges and sharing. Funds will be expended in ADB member countries only.

¹⁷ Includes construction and establishment of a resource center.

¹⁸ Includes priority operating costs, if any, to cover salary supplements and allowance for seconded technical staff.

¹⁹ Contingency is equivalent to 10% of base costs.

²⁰ SCF will have a service charge of 0.1% per annum on the disbursed and outstanding loan amount.

²¹ This includes: in-kind contributions (monetary value), MDB loan or grant, parallel financing, etc.

²² Other local, national and international partners to be involved in implementation of the project/program.

project management unit (PMU) of the MPWT will coordinate implementation. The Provincial Department of Public Works and Transport (PDPWT) will establish project implementation units (PIUs) in the provinces of Svay Rieng, Banteay Meanchay, Battambang, and Prey Veng. The concerned provincial or district office of the Public Works and Transport (PWT) will be responsible for O&M after project completion. The EA will implement this output through the project implementation units (PIUs) in each town. A supervising adaptation manager will be hired through a consulting package and will work in the Detailed Engineering Design (DED) Team to develop the technical solutions and bidding documents for the defined civil works. The sustainability of the project will be secured by providing training to the IAs, by integrating climate change adaptation into engineering tools and guidelines.

Procurement of Consulting Services:

The PPCR-financed components of the project will require consultancy support to be provided by a firm. An estimated 37 person-months involving 13 person-months for international and 24 person-months for national consultants are required to provide implementation support and advisory services on climate resilience measures for the infrastructure investments. A Team Leader cum Adaptation Specialist will oversee the work of all experts hired under this consulting service. The team leader will work closely with the PMUs and the Project DED consultants for those activities financed under the PPCR. The team leader will be responsible for coordination of all activities and with other ADB- and PPCR-financed components, through the PMUs. Procurement of consultancy services shall be done in accordance with ADB's *Guidelines on the Use of Consultants by ADB and its Borrowers (2010, as amended from time to time)*. The quality and cost-based selection method (QCBS) will be used using a 90:10 technical-financial ratio. The higher quality-cost ratio is proposed due to the complexity of Project implementation arrangements where four PIUs work under the coordination and oversight of four implementing agencies, and the limited institutional capacities of district and corridor town authorities in managing and implementing urban sector development loan project.

Procurement of Goods and Civil Works:

All procurement of goods, works and consulting services will be in accordance with *ADB's Procurement Guidelines (2010, as amended from time to time)*. International competitive bidding (ICB) will be applied for civil works packages exceeding \$5,000,000 equivalent. Within a year of Loan effectiveness, the EA shall submit a revised procurement plan to ADB for approval. This revised plan contains all ongoing procurement activities and those that are planned for the succeeding 18 months. The plan shall be updated annually or as required after every loan review mission or after award of each major ICB contract.

For changes in the procurement arrangements involving threshold, procurement methods and review requirements and contract packaging during Project implementation, the EA shall present its justification for the changes and submit an updated procurement plan for ADB approval. ADB will be responsible for posting the initial procurement plan and subsequent updates on the ADB website.

For any contract variation that would be in aggregate increase from the original contract amount by more than 15%, the EA shall provide detailed justification and seek no objection from ADB on the proposed contract variation. If the proposed variation is inconsistent with the procurement plan and the provision of the financing agreement, the ADB shall promptly advise the EA stating the reasons for its position. The EA shall furnish the ADB all amendments to the contracts for civil works for legal and record purposes.

Reporting and Monitoring:

The PMU will be responsible for all aspects of monitoring and evaluation through a Project Performance Management System (PPMS) which will be designed for the project based on the targets, indicators, assumptions and risks indicated in the DMF. The PMU will be supported by the project implementation support consultants in project monitoring. A separate organization will support the PMU in compliance monitoring with regards to issues on land acquisition and resettlement.

With support from consulting entities, the EA will submit quarterly progress reports to ADB. Progress will be monitored using intended outcomes and outputs described in the design and monitoring framework (DMF) of the RRP²³. The EA will monitor project progress in accordance with the project implementation schedule, and will keep ADB informed of any significant deviations from the schedule. Within three months of the project's completion, the EA will submit to ADB a project completion report. The form and content of the reports will be agreed with ADB and during the project inception mission.

The PMU will submit monthly financial reports in prescribed formats to the EA and ADB. The financial report will be audited annually by qualified auditors approved by the government and ADB. The audited financial report, which contains the measures on action being undertaken, shall be submitted by the EA to ADB.

²³ The DMF was designed with reference to the PPCR Results Framework and SPCR. The project is expected to result to improvements such as: transformative impacts on the socio-economic conditions of the beneficiary communities; enhanced capacities on integrating climate resilience into local development strategies and plans; and scaled up investments in climate resilience which are replicable in other GMS corridor towns and cities.

