PROJECT DOCUMENT

SECTION 1: PROJECT IDENTIFICATION

1.1	**Project title:**	Vulnerability Assessment and Adaptation Programme for Climate Change within the Coastal Zone of Cambodia Considering Livelihood Improvement and Ecosystems
1.2	**Project number:**	LDL/ PMS: 3890
1.3	**Project type:**	MSP
1.4	**Trust Fund:**	LDCF
1.5	**Strategic objectives:**	
	GEF strategic long-term objective:	Climate change adaptation
1.6	**UNEP priority:**	Climate Change, Ecosystem Management
1.7	**Geographical scope:**	National Cambodia
1.8	**Mode of execution:**	National Execution (External)
1.9	**Project executing organization:**	Ministry of Environment of Cambodia
1.10	**Duration of project:**	48 months Commencing: 03/01/2011 Completion: 31/12/2014

1.11	**Cost of project**	**US$**	**%**
	Cost to the LDCF	**1,798,500**	**30**
	Co-financing		
	Cash		
	Cambodia Climate Change Alliance (CCCA)	**2,200,000**	**36.7**
	Ministry of Water Resources and Meteorology (MoWRAM)	**1,400,000**	**23.4**
	Ministry of Agriculture, Forestry and Fisheries (MAFF)	**400,000**	**6.7**
	Sub-total	*4,000,000*	*66.74*
	In-kind		
	Ministry of Environment (MOE)	**195,000**	**3.2**
	Sub-total	*195,000*	*3.2*
	Total	**5,993,500**	**100**

1.12 Project summary

In line with guidance for the Least Developed Countries Fund (LDCF), this proposal seeks LDCF funding for a Medium-Size Project in Cambodia to implement the adaptation priorities "rehabilitation of coastal protection infrastructure" and "community mangrove restoration and sustainable use of natural resources", and contribute to adaptation priority "assessment of needs for setbacks, vegetation buffers and protection structures in coastal zones", all of which were identified during the Cambodian National Adaptation Programme of Action process. In addition to LDCF funding, funds for the implementation of the project are being mobilized through the Cambodia Climate Change Alliance (CCCA), which will serve as parallel co-financing for the project. The two funding sources will cover specific activities whilst contributing to the same objective ("*to reduce the vulnerability of coastal communities to the impacts of climate change by strengthening policy and science, and demonstrating targeted local interventions to increase ecosystem resilience*") and goal ("*to reduce coastal vulnerability to climate change impacts on agricultural systems and natural ecosystems within the coastal zone*").

The Cambodian coastal zone comprises four provinces (namely Sihanoukville, Kampot, Koh Kong, and Kep) and plays an increasingly important role in the country's development whilst continuing to provide vital environmental services. Approximately 45% of the population in Koh Kong and Sihanoukville and 80% in Kampot are engaged in agricultural activities. Natural ecosystems, infrastructure and agriculture within the coastal zone are presently threatened by several natural hazards such as storm surges, cyclonic activity, beach erosion and saline intrusion. Additionally, successions and combinations of droughts and floods have already resulted in a significant number of fatalities and considerable economic losses. Climate change is likely to adversely affect the natural ecosystems, infrastructure, agriculture and, indeed, community livelihoods within the coastal zone by resulting in: i) an increase in mean annual rainfall and rainfall intensity and a concomitant increase in episodes of flooding; ii) an increase in mean annual temperature; and iii) sea level rise. Sea level rise, for example, will increase the impact of cyclonic activity and storm surges and result in greater incidences of saline intrusion. Agricultural activities are largely concentrated in low-lying areas of the coastal zone due to the fertility of such areas, rendering agriculture particularly vulnerable to climate change impacts and risks.

The main climate change-induced problem facing Cambodian communities along the coast to be addressed by the project is firstly that climate change is likely to further reduce agricultural productivity, hamper livelihoods and degrade productive and protective ecosystems and secondly that coastal communities, district leaders, provincial leaders and national government presently lack the technical capacity, climate change knowledge, management capacity as well as the physical and financial resources to overcome and withstand the anticipated climate change-related threats. This capacity deficit and underlying vulnerability to climate change impacts are attributable to the following underlying non-climate change-driven causes: i) high poverty levels; ii) dependence on rain-fed agriculture; iii) unsustainable use of natural resources; iv) weak coordination of coastal development activities; and v) weak enforcement of policies.

Following principles of Ecosystem-Based Adaptation, the project will work to increase the resilience of natural ecosystems, such as mangrove forests, along the coast (as well as their functioning as buffer systems) and reduce the vulnerability of coastal communities to climate change impacts and risks. To achieve this, the project will *inter alia* rehabilitate degraded mangrove forests, introduce alternative livelihoods, protect agricultural production systems and raise awareness regarding climate change, its impacts and appropriate adaptation mechanisms. As well as implementing on-the-ground investments in vulnerable areas (i.e. Peam Krasaop district in Koh Kong and Prey Nup district in Sihanoukville), the project will create an enabling environment for effective adaptation in the coastal zone by providing policy advice and scientific tools for adaptation planning at the national and local levels. This will be realised through the achievement of the following outcomes:

1. Institutional capacity to assess climate change risks and integrate them into national development policies strengthened**.**
2. Adaptation planning in the coastal zone improved.
3. Vulnerability of productive systems to increased floods reduced.
4. Resilience of coastal buffers to climate change increased and livelihoods improved.

Apart from the NAPA priorities mentioned above, the project will also contribute to the attainment of Millennium Development Goals 1 and 7, and UNDAF's Outcome 2 for Cambodia as well as to the achievement of the objectives

of *inter alia*: i) Cambodia's Strategy for Agriculture and Water,; ii) the Cambodian National Biodiversity Strategy and Action Plan; iii) the National Strategic Development Policy; iv) The Agricultural Sector Strategic Development Plan; v) the National Programme for Sub-National Democratic Development; vi) the National Poverty Reduction; vii) and the National Water Resources Policy.

The project will be implemented by the United Nations Environment Programme and executed by the Cambodian Ministry of Environment in close cooperation with sectoral ministries as well as sub-national and local leaders.

TABLE OF CONTENTS

SECTION 1: PROJECT IDENTIFICATION 1
SECTION 2: BACKGROUND AND SITUATION ANALYSIS 7
2.1. Background and context 7
2.2. Threats, root causes and barrier analysis 21
2.3. Demonstration sites 26
2.4. Global significance 27
2.5. Institutional, sectoral and policy context 28
2.6. Stakeholder mapping and analysis 36
2.7. Baseline analysis and gaps 37
2.8. Linkages with other GEF and non-GEF interventions 40
SECTION 3: INTERVENTION STRATEGY (ALTERNATIVE) 45
3.1. Project rationale, policy conformity and expected global environmental benefits 45
3.2. Project goal and objective 48
3.3. Project components and expected outputs 48
3.4. Intervention logic and key assumptions 59
3.5. Risk analysis and risk management measures 61
3.6. Consistency with national priorities or plans 63
3.7. Additional cost reasoning 64
3.8. Sustainability 71
3.9. Replicability 71
3.10. Public awareness, communications and mainstreaming strategy 72
3.11. Environmental and social safeguards 73
SECTION 4: INSTITUTIONAL FRAMEWORK AND IMPLEMENTATION ARRANGEMENTS 73
SECTION 5: STAKEHOLDER PARTICIPATION 76
SECTION 6: MONITORING AND EVALUATION PLAN 78
SECTION 7: PROJECT FINANCING AND BUDGET 79
7.1. Overall project budget 79
7.2. Project co-financing 80
7.3. Project cost-effectiveness 80
Appendix 1: Budget by project components and UNEP budget lines 82
Appendix 2: Co-financing by source and UNEP budget lines 92
Appendix 3: Incremental cost analysis 98
Appendix 4: Results Framework 99
Appendix 5: Workplan and timetable 104
Appendix 6: Key deliverables and benchmarks 106
Appendix 7: Costed M&E plan 107
Appendix 8: Summary of reporting requirements and responsibilities 108
Appendix 9: Standard Terminal Evaluation TOR 109
Appendix 10: Decision-making flowchart and organisational chart 110
Appendix 11: Terms of Reference for key project groups, staff and sub-contractors 111
Appendix 12: Co-financing commitment letters from project partners 116
Appendix 14: Draft procurement plan 120
Appendix 15: Tracking Tools 125
Appendix 16: Danida project Environmental Management within the coastal zone 129
Appendix 17: Dynamic systems modelling 134
Appendix 18: Details regarding the demonstration sites 135
Appendix 19: Summary of consultations held 143
Appendix 20: Information related to the CCCA Coastal Component 172
Appendix 21: UNEP's comparative advantage 179

ACRONYMS AND ABBREVIATIONS

ADB	Asian Development Bank
AFD	Agence Française pour Développement
ADPC	Asian Disaster Preparedness Centre
AIT	Asian Institute of Technology
APR	Annual Project Review
AusAID	Australia Assistance for International Development
AWP	Annual Work Plan
CBNRM	Community Based Natural Resources Management
CCA	Climate Change Adaptation
CCC	Coastal Component Coordinator
CCCA	Cambodia Climate Change Alliance
CCD	Climate Change Department
CCU	Coastal Coordination Unit
CDC	Council for the Development of Cambodia
CDCF	Cambodia Development Cooperation Forum
CDM	Clean Development Mechanism
CEDAC	Cambodian Centre for Study and Development in Agriculture
CIDA	Canada International Development Agency
CMDGs	Cambodia Millennium Development Goals
CSC	Component Steering Committee
Danida	Danish International Development Agency
DFID	UK Department for International Development
DoF	Department of Fisheries
DNA	Designated National Authority
DRR	Disaster Risk Reduction
EA	Executing Agency
EBA	Ecosystems-based Adaptation
EC	European Commission
EEZ	Exclusive Economic Zone
EU	European Union
EXCOM	Provincial Executing Committees
FAO	Food and Agriculture Organisation
FiA	Fisheries Administration
FMMP	Flood Management Mitigation Programme
FWUC	Farmer Water User's Community
GCCA	Global Climate Change Alliance
GDCC	Government-Donor Coordination Committee
GEF	Global Environment Facility
GIS	Geographical Information System
GTZ	German Development Agency
IA	Implementing Agency
IC	International Consultant
ICM	Integrated Coastal Management
IDRC	International Research Centre-Canada
IFAD	International Fund for Agricultural Development
IGES	Institute for Global Environmental Strategies
IMT	Irrigation Management Transfer
INC	Initial National Communication
IPCC	International Panel on Climate Change
ISDR	International Strategy for Disaster Reduction
IWRM	Integrated Water Resource Management
JICA	Japanese International Cooperation Agency
LDCF	Least Developed Countries Fund
LoA	Letter of Agreement
M&E	Monitoring and Evaluation
MAFF	Ministry of Agriculture, Forestry and Fisheries
MDG	Millennium Development Goal
MIME	Ministry of Industry, Mines and Energy
MLMUPC	Ministry of Land Management, Urban Planning and Construction
MoE	Ministry of Environment
MoF	Ministry of Finance
MoH	Ministry of Health
MoT	Ministry of Tourism
MoU	Memorandum of Understanding
MoWRAM	Ministry of Water Resources and Meteorology
MPWT	Ministry of Public Works and Transport
MRCS	Mekong River Committee Secretariat
MRD	Ministry of Rural Development
MSP	Medium-Size Project
NAPA	National Adaptation Programme of Action
NC	National Consultant
NCCC	National Climate Change Committee
NCDD	National Committee for Sub-National Democratic Development
NCDM	National Committee for Disaster Management
NCSC	National Coastal Steering Committee
NGOs	Non-Governmental Organisation
NPC	National Project Coordinator
NPD	National Programme Director
NPRS	National Poverty Reduction Strategy
NP-SNDD	National Programme for Sub-National Democratic Development
NSDP	National Strategic Development Plan
NWRP	National Water Resources Policy
PEMSEA	Partnership in Environmental Management of the Seas of South-East Asia
PDA	Provincial Department of Agriculture
PDE	Provincial Department of Environment
PDFiA	Provincial Department of Fisheries Administration
PDWRAM	Provincial Department of Water Resources and Meteorology

PDLMUPC	Provincial Department of Land Management, Urban Planning and Construction
PIMD	Participatory Irrigation Management and Development
PIR	Project Implementation Review
PMMR	Participatory Management of Mangrove Resources
PPCR	Pilot Programme for Climate Resilience
PPG	Project Preparation Grant
PSB	Programme Support Board
PSC	Project Steering Committee
REDD	Reducing Emissions from Deforestation and Forest Degradation
RGC	Royal Government of Cambodia
RRC-AP	Regional Resource Centre for Asia and the Pacific
RS	Rectangular Strategy
SDS	Sustainable Development Strategy
SDS-SEA	Sustainable Development Strategy for the Seas of East Asia
SDP-WS	Strategic Development Plan for Water Sector
SEDA	Socio-Economic Development Plan
SEI	Stockholm Environment Institute
SENSA	Swedish Environmental Secretariat for Asia
SIDA	Sweden International Development Agency
SLR	Sea Level Rise
SNC	Second National Communication
STA	Senior Technical Advisor
T21	Threshold 21
TA	Technical Assistance
TM	Task Manager
TNA	Training Needs Assessment
ToR	Terms of Reference
TWG	Technical Working Groups
TWGAW	Technical Working Group on Agriculture and Water
TWGFE	Technical Working Group on Forestry and Environment
UNDP	United Nation Development Programme
UNEP	United Nation Environment Programme
UNEP-ROAP	UNEP Regional Office for Asia and the Pacific
UNFCCC	United Nations Framework Convention on Climate Change
VRA	Vulnerability Risk Assessment
WB	World Bank
WHO	World Health Organisation

SECTION 2: BACKGROUND AND SITUATION ANALYSIS

2.1. Background and context

1. This proposal seeks Least Developed Countries Fund (LDCF) funding for the Medium-Size Project (MSP) "Vulnerability Assessment and Adaptation Programme for Climate Change within the Coastal Zone of Cambodia Considering Livelihood Improvement and Ecosystems". The aim of this LDCF project is to reduce the vulnerability of coastal communities (and their agricultural activities and infrastructure, in particular) within the coastal zone to climate change impacts and future climate change risks arising from changes in rainfall and temperature regimes as well as in the frequency and intensity of climatic hazards (such as floods and droughts). To achieve this, the LDCF project (hereafter referred to as "the project") will: i) strengthen adaptive capacity at the national-, provincial- and local-levels; ii) create an enabling policy environment for adaptation within the coastal zone; and iii) improve climate change-related knowledge related to the coastal zone. In so doing, the project will ensure effective adaptation planning within the coastal zone. In addition, the project will pilot small-scale demonstration adaptation measures within the coastal zone to demonstrate ways to protect agricultural productivity and to improve the functioning of ecosystem buffer systems despite climate change impacts. In so doing, the project will implement the following high priority adaptation projects identified during the National Adaptation Programme of Action (NAPA) process: 3G ("rehabilitation of coastal protection infrastructure") and 4B ("community mangrove restoration and sustainable use of natural resources"). Additionally, the project will contribute to the achievement of project 2 ("assessment of needs for setbacks, vegetation buffers and protection structures in coastal zones"), a low priority adaptation project identified through the NAPA process[1].

2. Besides the funding received from the LDCF, the project will also be receiving parallel co-financing from the Cambodia Climate Change Alliance (CCCA). The two funding sources will be allocated towards complementary activities which will reduce the vulnerability of ecosystems and communities to climate change within the Cambodia coastal zone. Details regarding the relationship between this project and the CCCA are explained in Appendix 20.

Geographical context

3. Cambodia is a tropical country situated in South-East Asia with a total area of 181,035 km^2 (see Figure 1). The country has claimed its Exclusive Economic Zone (EEZ) of 200 nautical miles from the coastline to cover approximately 62,515 km^2 of the Gulf of Thailand. The Cambodian coastline extends along the north-eastern shore of the shallow Gulf of Thailand between the Thai and Vietnamese borders for approximately 435 km and consists of estuaries, bays, and some 64 islands. Four provinces are situated within the coastal zone, namely Sihanoukville, Kampot, Koh Kong, and Kep[2].

[1] The NAPA was developed to prepare a realistically achievable country-driven programme of action and to identify priority activities necessary to allow vulnerable Cambodians to adapt to the adverse impacts of climate change.

[2] Prior to December 2008 Kep and Sihanoukville were considered municipalities. On 22 December 2008, King Sihamoni signed a Royal Decree to make this official.

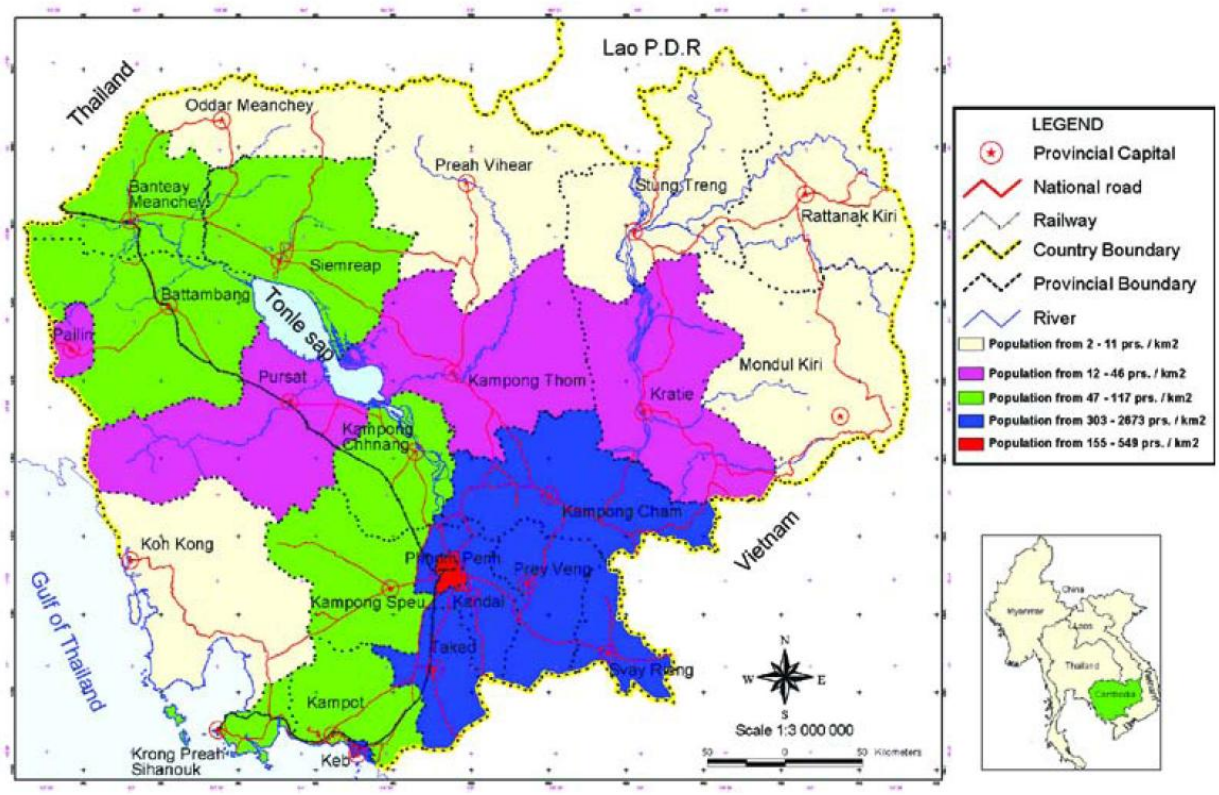


Figure 1. Administrative boundaries of provinces and population density (MoE, State of Environment Report 2004).

Socio-economical context

4. The total population in Cambodia is presently estimated at over 14 million people[3] with an annual growth rate of 1.78%[4]. The population within the coastal zone has been increasing steadily since 1981. Statistics collected by the Ministry of Planning, for example, indicate that the population within the coastal zone has increased from 673,000 in 1994 to 921,000 in 2005[5].

5. Cambodia has shown significant development since 1991, when more than two decades of isolation and conflict ended. Since then, priorities have turned to ensuring peace and security, rebuilding institutions, establishing a stable macro-economic environment, and putting in place a liberal investment regime. Gross domestic product (GDP) growth had been stable at nearly 9% over the last decade until 2008, when it dropped to below 7%. Presently, GDP growth is estimated to be approximately -0.9%, largely attributable to the global economic decline[6]. The incidence of poverty[7] remains high despite a decline from 34.7% in 2004 to approximately 30% in 2007[8]. Approximately 84% of the Cambodian population resides within rural areas[9].

[3] www.cia.gov/ (2010 estimate).
[4] www.cia.gov/ (2010 estimate).
[5] Source: Commune Database.
[6] www.cia.gov/ (2009 estimate).
[7] Defined as less than US$ 0.63/day in 2002 (NPRS, 2002).
[8] Updated NSDP, 2009 – 2013.
[9] Climate change country profile: Cambodia http://www.wpro.who.int/NR/rdonlyres/EF203FE3-0C6F-475F-B9C7-5C67364910E3/0/CAM2.pdf.

6. The economic growth prior to 2009, which was narrowly concentrated on the garment, tourism, and construction industries, was urban-focused with limited linkage to the rural economy. Over the past decade, this led to a rapid increase in inequality between rural and urban populations. Continuing weaknesses in the garment, tourism, and construction industries considerably reduced GDP in 2009[10]. This continues to undermine the steady gains made to reduce poverty, and may result in additional pressure being placed on vulnerable areas such as the coastal zone.

7. The coastal zone plays an important role in Cambodia's development and provides essential ecosystem services. In particular, the Cambodian coastal zone supports the industrial, agriculture, fisheries and transport sectors; offers recreational activities and attracts tourism. Figure 2 below depicts the percentage of the population within the coastal provinces engaged in the industrial, agriculture and services sectors. As a result of the limited employment opportunities in the industrial and service sectors, the majority of the population is engaged in the agriculture sector. This is particularly so for the poor population living in the rural areas, who have low levels of education; limited access to productive land, other assets, modern amenities and services; and are largely involved in low-paying and physically demanding occupations.

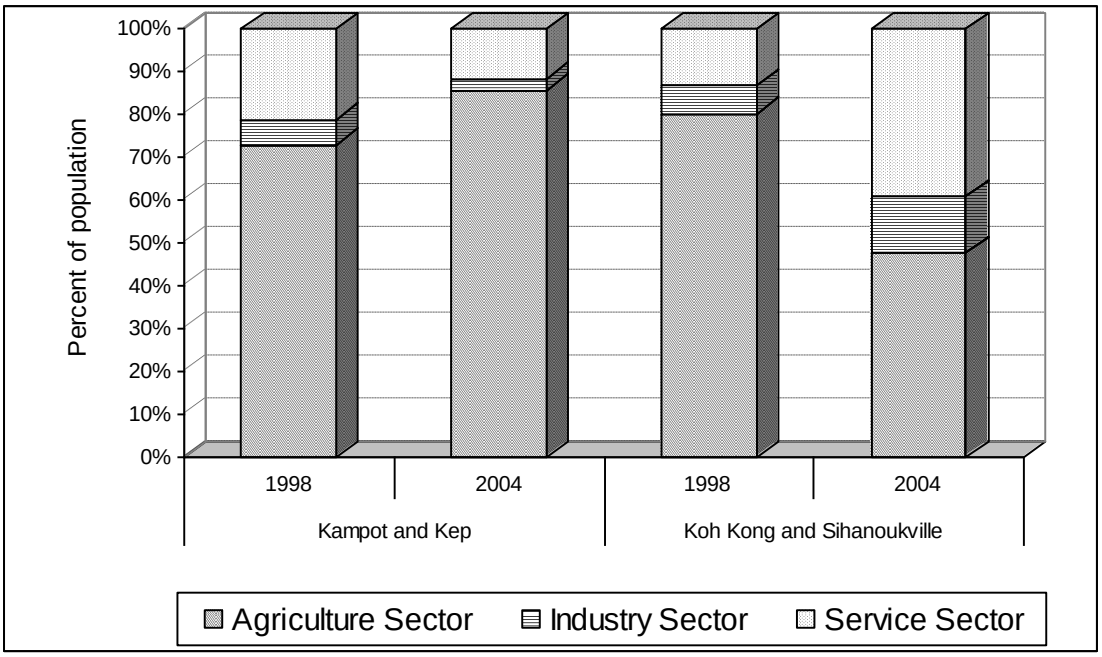


Figure 2: The employed population by the sector in coastal provinces 1998 and 2004. Source: State of the Environment Report, 2004).

Agriculture in the Cambodian economy

8. Agriculture in Cambodia remains the most important sector of the economy. Although total agricultural production has an annual average growth of 7.9%, its share of the GDP is decreasing due to the growth of the industrial sector. The agriculture sector's contribution to GDP has decreased from 90% of the GDP in 1985 to an average 42% during the period 1998 to 2003, and further declined to 31% in 2006[11]. However, Cambodia is largely still an agrarian society, with the majority

[10] ADB 2010. Cambodia Fact Sheet

[11] Agrifood Consulting International and CamConsult (2006) Diagnostic Study, Phase 1 of Design, Agricultural Program, Cambodia, 2007-12 – Program Concept Document Final Report. Prepared for AusAID by Agrifood Consulting International. Bethesda, Maryland.

of the population (approximately 84%) living in rural areas and depending mostly in agriculture for their livelihoods. Rice-based farming systems are the backbone of Cambodia's agriculture, occupying 84% of the total cultivated land area and providing 68-70% of the population's caloric requirements[12]. Other food crops are maize, cassava, sweet potato and other vegetables, which cover approximately 8% of the total cultivated area. Livestock and animal production is the main source of protein and also a source of income for Cambodian people. Fishery production is similarly an important food source in Cambodia and is concentrated predominantly in freshwater areas, where live catch fishing methods are mainly employed.

9. In spite of Cambodia producing enough rice to be self sufficient and even having an exportable surplus, the rice-based farming systems in the country are characterized by low productivity due to adverse weather conditions, insufficient technology, insufficient numbers of draft animals, inexperienced and incompetent personnel and security problems. Rice production is generally rain-fed with an average yield of less than two tonnes per hectare. Only 23% of the total rice area is irrigated. With an average landholding size of one hectare, and little diversification into other crops and agricultural activities, 70% of rural households growing paddy rice make an income per hectare of between US$ 100 and US$ 200 per annum. Poverty is therefore pervasive in rural Cambodia. Indeed, according to the UNDAF report (2006 - 2010[13]), chronic food insecurity is recurrent in Cambodia, affecting subsistence farmers, landless or marginal farmers and other vulnerable groups, such as indigenous people and women. This situation is exacerbated by frequent and unpredictable floods and droughts that have resulted in considerable rice production losses. For example, between 1998 and 2002, floods accounted for 70% losses in rice production, while drought accounted for 20% of the losses[14]. With climate change expected to increase the frequency of such extreme weathers events, there is a concern regarding the sustainability of the agriculture sector, in particular the impacts on rural poor households whose livelihoods are entirely based on rice production. Agricultural performance, predominantly rice production, is an important vehicle for sustainable economic growth, poverty reduction and rural economy development.

Natural resources within the coastal zone

Forests

10. Along the extensive coastline the land cover is predominately forests (e.g. dense forest and deciduous mosaic) (see Figure 3). The highest forest cover occurs in the Koh Kong province (83% or 1,002,721 ha), followed by the Sihanoukville province (54% or 81,539 ha) and the Kampot province (48% or 224,730 ha)[15]. The lowest forest cover is found in the Kep province (21% or 3,733 ha) (see Figure 4). Between 1993 and 2005, coastal forest cover has declined from 84% to 71% largely as a result of deforestation to aid agricultural expansion.

[12] Soeun, P. 2004. Country paper on Food safety overview in Cambodia. Paper for Global Food Safety Forum, November 18-19 2004, Beijing, China, *Ministry of Agriculture Forestry and Fisheries*. Available at: http://siteresources.worldbank.org/INTRANETTRADE/Resources/Topics/Standards/standards_training_challenges_cambodia.pdf [Accessed 05 October 2010].

[13] United Nations (2006). United Nations Development Assistance Framework 2006 – 2010.

[14] INC, 2002.

[15] State of the Coastal Environment Report, 2007, MoE.

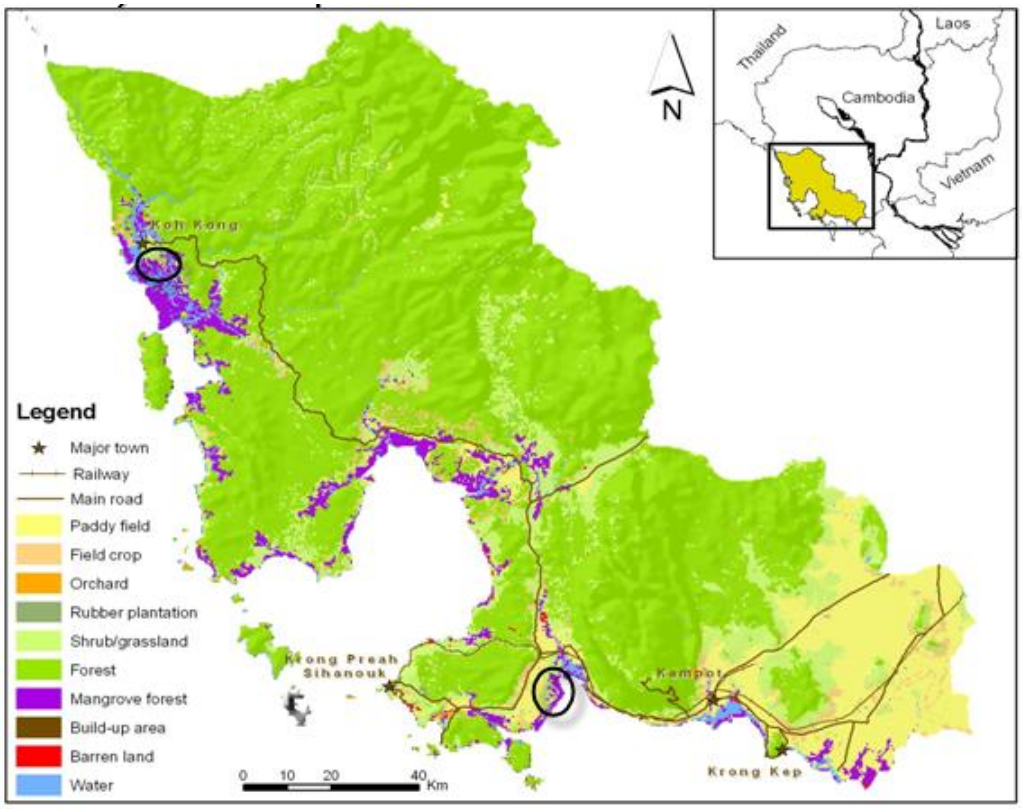
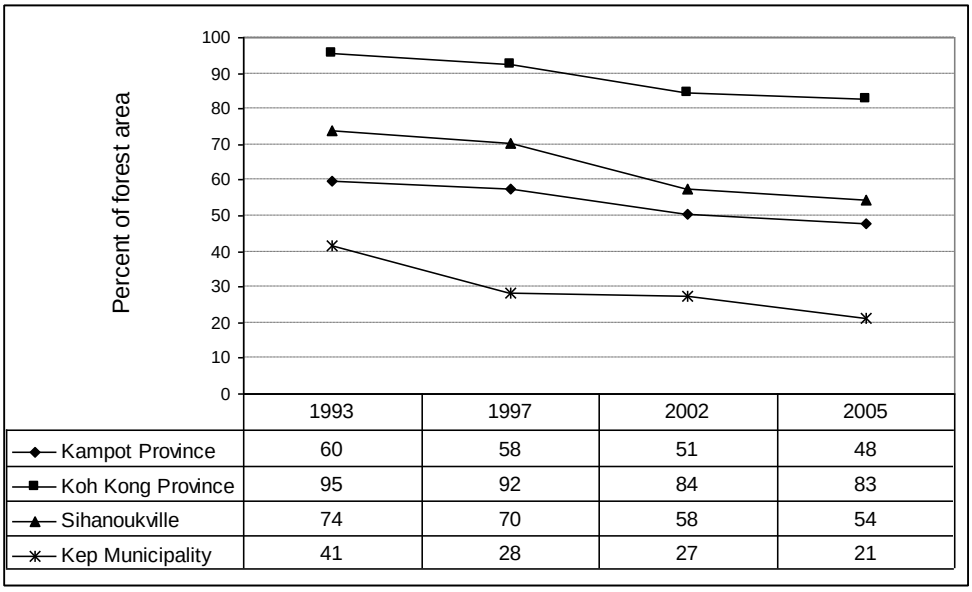


Figure 3: Land uses within the coastal zone.



	1993	1997	2002	2005
Kampot Province	60	58	51	48
Koh Kong Province	95	92	84	83
Sihanoukville	74	70	58	54
Kep Municipality	41	28	27	21

Figure 4: Forest cover in the coastal provinces as a percentage of land area and as an average of the coastal zone. (Source: Forest Administration, Forest Statistics, Cambodia, 2002 and 2004. - GIS Unit, Ministry of Environment (MoE), 2005).

11. In regions with low population density, mangrove cover remains relatively intact. However, in areas of high population density, the mangrove forests are degraded or completely destroyed. The total area

in Cambodia covered with mangrove forests[16] amounted to 55,419 ha in 2005. Mangrove forests declined by 7735 ha (or 12%) between 1997 and 2005 (see Table 1). Other studies estimate the decline to be approximately 25% between 1993 and 2005[17]. Mangrove clearing is undertaken illegally for use as firewood or for charcoal production. Additionally, clearing is often as a result of investment activities, such as saltpans, land reclamations and intensive shrimp aquaculture. Mangrove clearing is a significant concern because mangrove ecosystems are highly productive and play an essential role in the survival of numerous fish species and other marine organisms. For example, they serve as spawning or nursery grounds for several commercially important fish species. Mangroves also play an essential role in protecting the coastline in that they act as a resilient buffer zone against tropical cyclones, strong winds, storm surges and tidal activity and thereby reduce coastal erosion[18]. Additionally, intact mangrove forests are recognised as providing an effective buffer against climate change-related sea level rise (SLR), cyclonic activity and storm surges.

Table 1: Change in Mangrove Distribution from 1997 to 2005.

Province/District	Area in 1997 (ha)	Area in 2002 (ha)	Area in 2005 (ha)	Change 1997-2002	Change 2002-2005
Kampot Province					
Kampong Trach	3854	319	334	-3535	15
Kampot	1179	660	672	-519	12
Kampong Bay	585	408	432	-177	24
Koh Kong Province					
Botum Sakor	12889	11216	11516	-1673	300
Kiri Sakor	4360	4203	4439	-157	236
Koh Kong	11150	11044	10437	80	-607
Smach Meanchey	2085	2265	2109	180	-156
Mondul Seima	6027	6889	6124	862	-765
Srae Ambel	11112	10452	10684	-661	232
Kampong Seila	818	0	0	-818	0
Sihanoukville Province					
Mittakpheap	146	45	45	-101	0
Prey Nup	7402	7479	7308	77	-171
Stueng Hav	352	490	487	-160	-3
Kep Province					
Damnak Chang'aeur	952	666	676	-286	10
Kep	130	165	157	35	-8
Total	**63039**	**56301**	**55419**	**-6853**	**-882**

Source: JICA 1997 Land Use Data; MoE 2002 and 2005 Interpretation.

Seagrasses

12. Significant areas of Cambodia's shallow, protected coastal waters provide a suitable habitat for seagrasses, which provide cover for juvenile fish and are consequently used as nursery grounds for many different fishes, crustaceans, and invertebrates. Indeed, Cambodia's coastal zone houses one of the world's largest seagrass areas[19], which consists of eight seagrass species. Although little evidence

[16] The term 'mangrove' applies to those species of plants that are adapted to saline conditions in tropical inter-tidal zones.
[17] JICA 1997 Land Use Data; MoE 2002 and 2005 Interpretation.
[18] F. Blasco, P. Saenger & E. Janodet, 1996. Mangroves as indicators of coastal change. Catena 27, 167-178.
[19] Marine Conservation Cambodia, 2010. Available from: http://www.marineconservationcambodia.org [Accessed 1 July 2010].

is available regarding the extent of seagrass beds, it is documented that they cover approximately 25,240 ha in the Kampot province[20]. Seagrass beds are also important from a conservation perspective because of the number of species they support, which include the particularly vulnerable dugong (which feed almost exclusively on seagrass) and seahorses (which are associated with seagrasses for most, if not all, of their lives)[21]. Additionally, seagrass beds act as a surge break and are an important first line of defence against climate-change induced SLR and thus are an effective means of reducing coastal erosion. Seagrass beds are vulnerable to impacts resulting from two main sources, namely: i) degradation of water quality; and ii) destructive fishing practices, such as push nets and trawling in the seagrass beds. Degradation of water quality results primarily from logging, sand mining and coastal reclamation activities, which reduce the transparency of water and thereby the depths to which the seagrasses can grow.

Coral reefs

13. Coral reefs exist in almost all areas around islands off the coast of Cambodia. However, little is known about the distribution, composition or health of the reefs. Coral reef coverage is estimated to be 2,700 ha along the Cambodian coastline, with the most extensive coverage occurring in Kampot and Sihanoukville[22]. Coral reefs are presently threatened by over-fishing, harvesting of the corals for trade, degradation of the water quality and the use of destructive fishing practices (such as dynamite or 'blast fishing'[23]). Approximately 70 coral species are found within Cambodia's coastal zone. Coral reefs also act as important surge breaks and also form the first line of defence against tropical cyclones, storm surges and tidal activity along the coast and thus serve as a protective barrier preventing high levels of coastal erosion.

14. Coastal erosion has been observed in a number of areas along the Cambodian coastline[24]. For example, a number of areas in Kep have been found to be suffering from moderate to severe erosion. Coastal defense structures, such as seawalls and groynes, have been constructed along some of the particularly badly eroded stretches. However, these structures may have impacts on the movement of water and sand in the coastal area and thus may be exacerbating the erosion problem.

15. Several areas along the Cambodian coastline are undergoing land reclamation[25]. This is occurring mainly around the relatively urbanised areas of Sihanoukville and Kep, or areas which are being newly developed, such as near the Naval base in Ream and the port of Oknha Mong at Keo Phos. These reclamations are generally of a small scale, the purpose primarily being to extend the land area for private plots of land. However, the impacts of land reclamation on the movement of water and sand remain significant, particularly for adjacent areas of the coastline which do not have any coastal protection. Additionally, some large-scale reclamation is taking place within the coastal zone around Kampot and Kampong Bay River.

[20] Seagrass in the South China Sea: Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand. UNEP/GEF Regional Working Group on Seagrass. 2004.
[21] Seagrass in the South China Sea: Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand. UNEP/GEF Regional Working Group on Seagrass. 2004.
[22] Department of Fisheries 2005, MAFF.
[23] Although illegal across most of the world, blast fishing is widespread in South-East Asia. Blast fishing involves using sticks of dynamite to stun fish, which often damages coral reefs in the process.
[24] Shoreline Management Investigation, MoE 2005.
[25] Shoreline Management Investigation, MoE 2005.

Water Resources

16. Cambodia has a unique hydrological system. The Mekong River and Lake Tonle Sap are connected by the Tonle Sap River which reverses its direction of flow twice a year. Approximately 86% of Cambodia's territory (156,000 km^2) is included in the Mekong River basin, the remaining 14% draining directly towards the Gulf of Thailand. On average, 471 km^3/year[(26)] flow out of the country in the Mekong channels and tributaries to Vietnam. The internal renewable surface water resources are estimated at 116 km^3. Groundwater resources are estimated at 18 km^3, most of which (an estimated 13 km^3/year) is drained by the rivers and cannot be considered as additional water resources. The total renewable water resources of Cambodia are therefore estimated to be 476,110 km^3/year. Water withdrawal was estimated at 520 million m^3 in 1987, of which 94% was for agricultural purposes. The capacity of existing dams is generally low and only an estimated 19% of the total population had access to water supply in 1992. Consequently, water shortages are common across Cambodia. For example, a survey undertaken under the NAPA process in 2006 highlighted that of the 684 households interviewed, 81% claimed to suffer from shortages of water for agricultural purposes and 54% responded that they suffered from shortages of water for household use. As a result of water shortages during the dry season, approximately 43% of households in Cambodia consume drinking water from non-improved sources, the quality of which is likely to be unsuitable for drinking[27].

17. The main sources of freshwater within the coastal zone are rivers, streams, and lakes. The coastal rivers and streams are normally short and start from hills of approximately 500 m to 600 m in altitude. During the rainy season, the rivers and streams are often in flood, which results in widespread destruction of crops in the low-lying areas. During the dry season, the lower reaches of the rivers fill up with seawater, thereby rendering the water unsuitable for irrigation purposes. The Cambodian coastal zone has large quantities of seasonal freshwater. However, the water resources have not yet been developed for agricultural, industrial or household use and many areas are lacking sufficient quantities of water during the dry season. The lack of development of water resources is largely due to the fact that the Ministry of Water Resources and Meteorology (MoWRAM) was first established in 1999 with limited funding available for the development of irrigation systems. Furthermore, existing irrigation systems are in significant disarray as a result of the Pol Pot era, and some of the irrigation systems were incorrectly constructed. Eighty percent of agricultural land has low yields due to the lack of irrigation systems. Indeed, the water shortage problem prevents farmers along the coast from harvesting more than one rice crop per year. In the near future, this problem is likely to become more severe as demand for water increases as a result of an increase in population size and corresponding agricultural and industrial activities.

General climatic conditions of Cambodia

18. Cambodia has a tropical monsoon climate. The climate is governed by monsoons and characterised by two major seasons: i) from mid-May to early October when strong prevailing winds from the southwest bring heavy rains and high humidity; and ii) from early November to mid-March when winds and humidity are low. The average annual rainfall is 1,400 mm in the central low land regions and may reach 5,000 mm within the coastal zone or in certain highland areas (Figure 5). The average annual temperature is 28 ºC, with a maximum monthly average of 38 ºC in April, and a minimum

[26] FAO (Content Source); Marty Matlock (Topic Editor) . "Water profile of Cambodia". In: Encyclopedia of Earth. Eds. Cutler J. Cleveland (Washington, D.C.: Environmental Information Coalition, National Council for Science and the Environment). [First published in the Encyclopedia of Earth September 30, 2008. Available from: http://www.eoearth.org/article/Water_profile_of_Cambodia.

[27] UNDP Climate Change Country Profiles Cambodia C. McSweeney, M. New & G. Lizcanol. Available from: http://country-profiles.geog.ox.ac.uk.

average of 17 ºC in January[28]. The extreme seasonality in rainfall results in corresponding variability in water supply with flooding in the wet season and water shortages in the dry season.

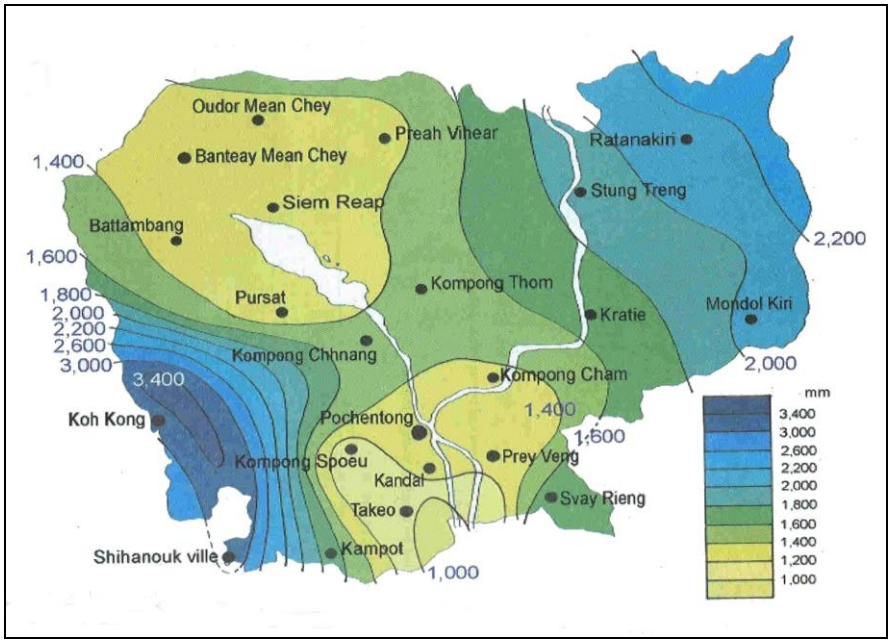


Figure 5: Distribution of average annual rainfall (1981-2004). Source: MoWRAM (2005).

19. The coastal zone of Cambodia experiences high relative humidity with mean annual relative humidity values of approximately 85%. Minimum average humidity is recorded in December and January, while maximum relative humidity occurs in August through October. Cambodia's coastal zone is affected by tropical cyclones from the Pacific Ocean on an annual basis; however, the country is rarely exposed to the full force of tropical cyclones because it is surrounded by mountain chains which reduce the force of the typhoons. Storms occur more frequently during the period from August to November, with the highest frequency in October.

Observed climate hazards and climate change trends and impacts in Cambodia

20. The observed climate change, including varaibility in Cambodia and South-East Asia over the recent past includes the following:
    - an increase in mean annual temperature of between 0.1 and 0.3 ºC per decade between 1951 - 2000[29];
    - an increase in the frequency of hot days[30] and warm nights since 1960[31];
    - a declining trend in rainfall across South-East Asia between 1961 – 1998[32] although mean annual rainfall over Cambodia does not reflect any consistent increase or decrease since 1960[33];

[28] MoE, 2002.
[29] Cruz, R.V., H. Harasawa, M. Lal, S. Wu, Y. Anokhin, B. Punsalmaa, Y. Honda, M. Jafari, C. Li and N. Huu Ninh, 2007: Asia. *Climate Change 2007: Impacts, Adaptation and Vulnerability*. *Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 469-506.
[30] 'Hot' day or 'hot' night is defined by the temperature exceeded on 10% of days or nights in current climate of that region and season.
[31] UNDP Climate Change Country Profiles Cambodia C. McSweeney, M. New & G. Lizcanol. Available from: http://country-profiles.geog.ox.ac.uk.

- an increase in the frequency and intensity of extreme weather events across South-East Asia associated with El Niño over the past two decades[34];
- an increase in the frequency and severity of floods, windstorms and droughts in Cambodia[35]; and
- the occurrence of extreme weather events, such as windstorms, in areas in which they had previously been absent[36].

21. Episodes of floods and droughts are identified as the two main climate hazards experienced by the majority of provinces within Cambodia[37]. Such hazards have resulted in a high number of casualties, the destruction of infrastructure and crops and the death of many livestock. The most severe of floods to date (which occurred in 2000), for example, affected 3.5 million people, killed 350 people, damaged 320,000 houses, destroyed 7,068 houses and caused extensive damage to crops and infrastructure which amounted to approximately US$ 150 million[38]. Additionally, the most severe drought (which occurred in 2002) affected more than 2,000,000 people and destroyed more than 100,000 ha of rice paddy fields. Cambodia's Initial National Communication (INC, 2002) reports that, over the five years prior to the development of the INC, 70% of rice production losses were attributable to floods and 20% to droughts. In general, floods occur twice a year along the Cambodian coastline – as a result of heavy rainfalls during the rainy season and as a result of tidal action (often exacerbated by tropical cyclones), which normally occurs during the dry season. Flooding has reportedly become more severe in recent years, which is ascribed to destructive anthropogenic activities, such as sand mining and coastal reclamation activities near the river mouth. Agricultural activities are particularly vulnerable to tidal and flooding activity along the coast as a result of their concentration in low-lying coastal zones due to the fertility of such areas.

22. In the climate change screening of Cambodia undertaken by Danida[39], it was concluded that "*addressing the flood and drought regimes controlled by the monsoon rains is a key element for livelihoods in Cambodia. The consequences of climate-sensitive human health impacts (water- and insect-borne diseases), access (disruption of infrastructure) and food security (e.g. impacts of agricultural pests) are likely but the link to climate change is not yet widely documented or common knowledge. The ability to address current climate variability is a further indication of coping capacity vis-à-vis future climate change. Currently, there may already be an adaptation deficit, i.e. a lack of capacity and capability to adapt and avoid impacts of current climate variation*."

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[32] Cruz, R.V., H. Harasawa, M. Lal, S. Wu, Y. Anokhin, B. Punsalmaa, Y. Honda, M. Jafari, C. Li and N. Huu Ninh, 2007: Asia. *Climate Change 2007: Impacts, Adaptation and Vulnerability*. *Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 469-506.

[33] UNDP Climate Change Country Profiles Cambodia C. McSweeney, M. New & G. Lizcanol. Available from: http://country-profiles.geog.ox.ac.uk.

[34] Cruz, R.V., H. Harasawa, M. Lal, S. Wu, Y. Anokhin, B. Punsalmaa, Y. Honda, M. Jafari, C. Li and N. Huu Ninh, 2007: Asia. *Climate Change 2007: Impacts, Adaptation and Vulnerability*. *Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 469-506.

[35] According to villagers' observations included in the NAPA (2006).

[36] According to villagers' anecdotal evidence (NAPA, 2002).

[37] MoE, 2005.

[38] MoE 2005, 2006 and WHO: Climate Change Country Profile: Cambodia (http://www.wpro.who.int/NR/rdonlyres/EF203FE3-0C6F-475F-B9C7-5C67364910E3/0/CAM2.pdf).

[39] Ministry of Foreign Affairs of Denmark, Danida; Climate change screening of Danish development cooperation with Cambodia; 2008: http://www.Danidadevforum.um.dk/NR/rdonlyres/F4FEDB72-1D66-48F2-A31B-8D672910DD1C/0/Cambodia.pdf.

23. Between October and early December, three coastal communes (namely: Toeuk Lark, Toeuk Thla and Samaki in Prey Nup district, Sihanoukville Province) experience strong, dry winds which cause severe damage to infrastructure and crops. Although there is no scientific recording of these strong winds, there is anecdotal evidence[40] that they are experienced on an annual basis with extremely strong winds occurring once in every two to three years. During 2006, strong winds destroyed nine houses and 470 houses were damaged (e.g. roofs blown away). A study undertaken by the Asian Disaster Preparedness Center (ADPC) under the Danida-funded "Enhancing Community Resilience to Natural Disasters in South-East Asia Project" suggests that this phenomenon is linked to the reversal of trade winds from east to west in November, which is a part of large-scale atmospheric circulation.

24. Presently, communities across Cambodia employ various coping mechanisms in response to climatic hazards and variability. However, these mechanisms are limited in their effectiveness. During the preparation of the NAPA (2006), villagers were interviewed regarding their coping mechanisms. It was found that approximately 17% of the 684 households interviewed do not adjust their planting regimes in response to flooding and drought events. During drought events, 24% of interviewees organise religious ceremonies in the hope that such ceremonies will bring rain and 17% reduce the amount of water they use for personal hygiene purposes. Other coping mechanisms employed include: i) building elevated enclosures for livestock; ii) preparing boats; and iii) increasing feedstock for livestock[41]. Most of the existing coping mechanisms prove unsuccessful, such as shifting planting dates (the success of which is limited due to the lack of weather forecasts at a local scale) and switching to flood-resistant rice varieties (which prove unable to survive periods of drought)[42].The results of the survey undertaken also highlighted that water shortages are common across Cambodia (see paragraphs 16 - 17).

25. Overall, the Cambodian coastal zone is presently threatened by several natural hazards, such as tropical cyclones, storm surges, beach erosion and saline intrusion and activities within the coastal zone are hampered by tidal activity and episodes of drought and flooding. As a result, few of the anticipated climate change impacts (discussed below) will be novel but are more likely to compound and amplify already existing development challenges and stresses.

Climate change projections and predicted impacts

26. There are few long-term climate observations available for Cambodia, largely due to years of conflict. As a result, it is difficult to determine significant and reliable trends in climate and thus make credible projections of climate change. For example, although downscaled climate projections are available for neighbouring countries, such projections are not available for Cambodia[43]. Additionally, model simulations provide differing scenarios regarding the projected changes in the amplitude of future El Niño events. El Niño influences monsoon variability in South-East Asia, a relationship which is also poorly understood, contributing to uncertainty in climate projections for this region. Despite these uncertainties, the following climate change predictions have been made for Cambodia:
    - an increase in mean annual rainfall across the country by 3 to 35% by 2100[44] with the magnitude of change varying spatially and temporally (for example, lowland areas are likely to experience a greater increase in rainfall than in highlands);

[40] According to the communities in the Tuek Lark commune.
[41] NAPA, 2006.
[42] NAPA, 2006.
[43] WikiADAPT, 2010. Available from: http://wikiadapt.org.
[44] This prediction and that within the second bullet point is based on the global warming scenarios SRESA2 (reference) and SRESB1 (policy) and General Circulation Models (GCM) CCSR and CSIRO (INC, 2002).

- an increase in rainfall along the coast of 2 to 6% by 2050[45];
- an increase in frequency and intensity of flooding events due to more frequent episodes of heavy rainfall[46];
- an increase in mean annual temperatures of 0.3 to 0.6 °C by 2025[47], of 0.7 to 2.7 °C by the 2060s and of 1.4 to 4.3 °C by the 2090s[48];
- a substantial increase in the number of 'hot' days and nights[49]; and
- sea level rise (SLR) of 0.18 to 0.56 m[50] by the 2090s.

27. If SLR was to reach 1 m, as is predicted by various sources[51], approximately 44 km^2 (0.4%) of Koh Kong province, and 56% of its provincial centre would be inundated[52] (see Figure 6). Of this area, 70% is covered by mangrove forests. Although a comprehensive economic assessment was not undertaken, potential damage to infrastructure was estimated at approximately US$ 21 million. Koh Kong Province is arguably the most vulnerable coastal province in terms of SLR impacts. This is attributable to its extensive low-lying area, its high population density and the extent of its valuable natural resources (e.g. mangrove forests). It should be noted that even though an increase in SLR of less than 1 m would inundate a comparably smaller area than predicted for a 1 m rise, the flood risk experienced by areas along the coast is nonetheless likely to increase, in particular during the rainy season, due to the potential changes in the hydrological patterns of the coastal rivers. SLR is likely to exacerbate coastal erosion and amplify the impact of storm surges and tidal action[53]. SLR of as little as 5 cm can, for example, mimic the effects of a 1 m rise in sea-level following tropical storm activity or tidal surges (Bruun's Rule[54]).

[45] INC, 2002.
[46] INC, 2002 and the NAPA, 2006.
[47] INC, 2002. Cambodia is presently preparing its Second National Communication to the UNFCC but this has not yet been made available. The IPCC projects an increase in temperature of between 1.5 and 3.7 ºC by 2100 for South-East Asia as a region.
[48] UNDP Climate Change Country Profiles Cambodia C. McSweeney, M. New & G. Lizcanol. Available from: http://country-profiles.geog.ox.ac.uk.
[49] UNDP Climate Change Country Profiles Cambodia C. McSweeney, M. New & G. Lizcanol. Available from: http://country-profiles.geog.ox.ac.uk.
[50] UNDP Climate Change Country Profiles Cambodia C. McSweeney et al. Available from: http://country-profiles.geog.ox.ac.uk. (Taken from the IPCC Working group I (*The Physical Science Basis*): Chapter 10 (Global Climate Projections) (Meehl *et al*., 2007). Regional sea-level projections are estimated by applying regional adjustments (Fig 10.32, p813) to projected global mean sea-level rise from 14 AR4 models.) The range represents the results of three different models, namely the SRES B1 (0.18 to 0.43 m), SRES A1B (0.21 to 0.52 m) and SRES A2 (0.23 to 0.56 m).
[51] E.g. Ananthaswamy, A. Sea-level rise: It's worse than we thought. New Scientist 2715, Jul 01 2009.
[52] INC, 2002.
[53] NAPA, 2006.
[54] Brunn's Rule describes the cross-shore response of a beach to sea level rise. According to this rule, one unit of SLR produces 50-100 units of water movement landwards thereby accelerating inundation and beach erosion. Available from: http://www.cmar.csiro.au/sealevel/sl_drives_short.html (accessed 25 June 2010).

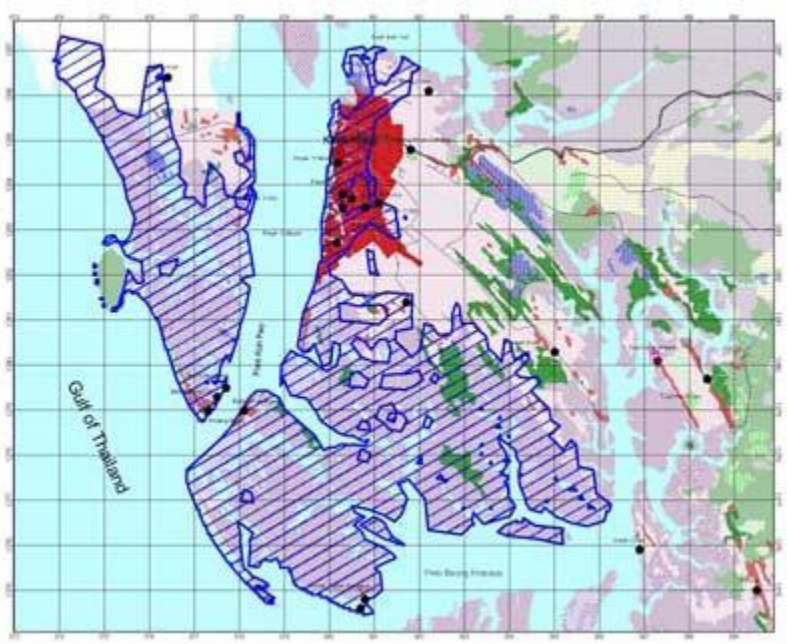


Figure 6. The area likely to be inundated as a result of SLR of 1 m in Koh Kong Province (displayed in blue) (INC, 2002).

28. SLR is also likely to lead to further incidences of saline intrusion, which presently hamper agricultural production and contaminate underground sources of freshwater along the coast. For example, at present, saline intrusion contaminates drinking wells sunk by community members in coastal areas, which reduces access to safe drinking water for vulnerable communities[55]. Additionally, saltwater will penetrate further up short river systems in the dry season, thereby further reducing the availability of freshwater along the coast.

29. Variations in mean annual temperature and rainfall are projected to increase as indicated in Figures 7 and 8 below. Additionally, mean annual temperature is likely to increase as a result of climate change (Figure 7). This is likely to have significant adverse effects for crop production by increasing evapotranspiration rates thereby reducing income streams and aggravating existing food security problems. Furthermore, increased temperatures will reduce freshwater availability within the coastal zone.

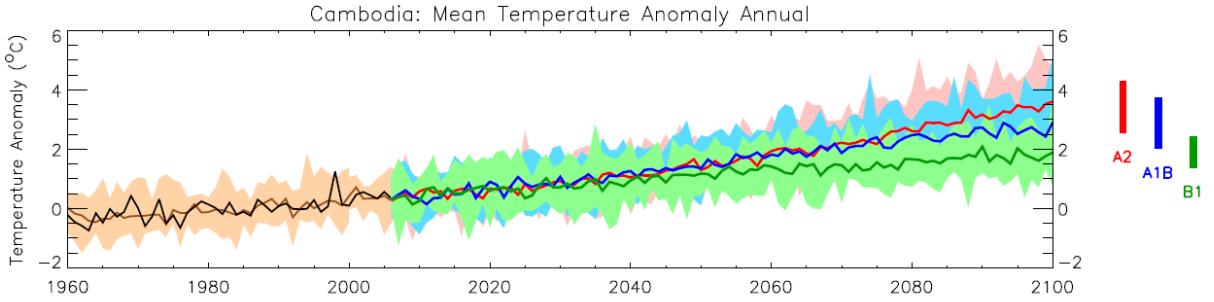


Figure 7: Trends in annual and seasonal mean temperature for the recent past and the projected future. All values shown are anomalies, relative to the 1970-1999 mean. Black trend lines show the mean of observed data from 1960 to 2006. Brown trend lines show the median (solid line) and range (shading) of model simulations

[55] This was highlighted by commune leaders met with during the visit by the consultants to Koh Kong and Sihanoukville Provinces in June 2010 (see Appendix 18).

of recent climate across an ensemble of 15 models. Coloured trend lines from 2006 onwards show the median (solid line) and range (shading) of the ensemble projections of climate under three emissions scenarios. Coloured bars on the right-hand side of the projections summarise the range of mean 2090-2100 climates simulated by the 15 models for each emissions scenario. Taken from UNDP Climate Change Country Profiles Cambodia C. McSweeney, M. New & G. Lizcanol. Available at: http://country-profiles.geog.ox.ac.uk.

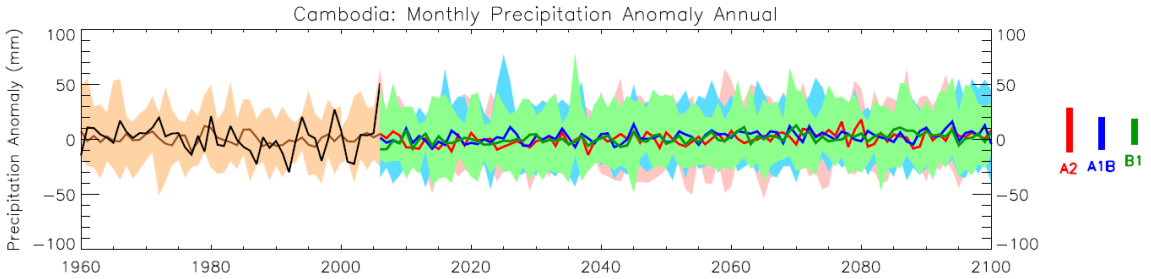


Figure 8: Trends in monthly precipitation for the recent past and projected future. All values shown are anomalies, relative to the 1970-1999 mean climate. See Figure 7 for details.

30. Episodes of flooding (as result of both heavy rainfall and tidal activity) along the coast are likely to increase in frequency and intensity[56] with adverse consequences for *inter alia* agricultural production, livelihoods, coastal ecosystems and infrastructure. On the other hand, the predicted increase in temperature will increase evapotranspiration and thus reduce soil water availability. This will serve to exacerbate the severity of droughts when they occur[57]. Indeed, successions and combinations of floods and droughts have lead to the death of many people and caused significant economic losses across Cambodia to date[58]. Variations in rice production are significantly correlated with climate variability, particularly to flood and drought activity (see paragraph 21)[59]. Thus, an increase in flood and drought activity as a result of climate change will result in a significant increase in rice crop failures. Increased and more intense episodes of rainfall combined with SLR as a result of climate change will aggravate the impacts of flooding. This situation could become even more serious if the current level of deforestation continues[60].

31. Furthermore, changes in sea-level, storm intensity and sea surface temperature as a result of climate change are likely to have adverse impacts for valuable natural resources within the coastal zone, such as mangrove forests, seagrass beds and coral reefs (see paragraphs 11 - 13). SLR, for example, is likely to upset the saltwater concentration of estuarine waters that mangrove species depend on, which may lead to the death of mangrove forests in certain areas. Additionally, an increase in sea surface temperature and SLR is likely to increase the stress levels of Cambodia's seagrasses and coral reefs. Coral reefs are particularly sensitive to changes in water clarity and temperature and even a slight increase in temperature and/or decline in water clarity are likely to have significant impacts on the health of these sensitive systems.

32. Present coping strategies (as highlighted in paragraph 24) are not necessarily suitable and are unlikely to allow communities to withstand future climate change impacts, such as the increased frequency of

[56] NAPA, 2006.
[57] WikiADAPT, 2010. Available from: http://wikiadapt.org.
[58] NAPA, 2006.
[59] INC, 2002.
[60] Data regarding logging within the coastal zone is not available, but levels are considered high. However, it has been recorded that 241, 628 ha of forests were deforested to aid another land use (e.g. agriculture) within the coastal zone between 1993 and 2005 (Second State of the Environment Report, MoE, 2004).

floods and drought activity. As a result, a major effort is required to strengthen capacity and thus facilitate adaptation planning and resilience-building at the community level. As climate change affects a number of sectors, this capacity building has to take a cross-sectoral and integrated approach. Coastal communities, particularly those in low-lying areas, are highly vulnerable to the predicted climate impacts and have a very limited resilience to cope with climatic hazards, particularly floods and droughts.

33. In addition, vector-borne diseases (particularly malaria) may become increasingly widespread under changing climatic conditions[61]. With approximately 800 deaths per year[62], Cambodia already has the highest malaria-related fatality rate in Asia[63]. As a result of the relationship between the transmission of malaria and warm, wet conditions, it is likely that the prevalence and incidence of malaria will be exacerbated by climate change. Indeed, it is predicted that malaria may increase by 16% as a result of climate change[64]. The same can be said for the incidence of other vectore-borne diseases, such as Dengue Fever, across Cambodia. Higher rates of vector-borne diseases as a result of climate change, which will be particularly evident in rural areas, and may reduce the resilience of the rural poor to the other impacts associated with climate change and compound the climate-related pressures on livelihoods that are heavily dependent on natural resources, water resources and agriculture.

34. The influence climate change is likely to have on the monsoon system that affects Cambodia is presently unclear as a result of the complex interactions that affect the system. This adds an additional degree of uncertainty for climate change projections for Cambodia. Furthermore, the uncertainty over the effect climate change will have on the monsoon system suggests that more severe impacts should not be dismissed[65].

The problem to be addressed by the project

35. The main problem facing Cambodian communities along the coast to be addressed by the project is that *firstly climate change is likely to further reduce agricultural productivity, impact negatively on livelihoods and degrade productive and protective ecosystems and secondly coastal communities, district leaders, provincial leaders and national government presently lack the technical capacity, climate change knowledge, management capacity as well as the physical and financial resources to overcome and withstand the anticipated climate change impacts.*

2.2. Threats, root causes and barrier analysis

36. The baseline context underpinning the climate change-induced problem (see paragraph 35) is described in paragraphs 8 - 22. Additionally, the climate change-induced causes have been detailed in paragraphs 23 - 31. The causes that explain the situational context are described below.

Non-climate change-driven causes

Poverty

37. Cambodia has a high rate of poverty (approximately 30%, see paragraph 5) and the majority of the population (approximately 84%) resides within the rural areas. It is the poor and marginalized communities that are the most vulnerable to climate change impacts because they are particularly

[61] INC. 2002 and NAPA (2006).
[62] The actual death toll is potentially 5 – 10 times this figure (NAPA, 2006).
[63] Centre for Parasitology, Entomology and Malaria Control, 2003. Annual Progress Report. Phnom Penh: CNM.
[64] Ministry of Health, 2002.
[65] WikiADAPT, 2010. Available from: http://wikiadapt.org.

sensitive to, and have the least capacity to adapt to, such impacts. Within the coastal zone, there are limited livelihood sources in the urban areas. As a result, the majority of the coastal population rely on agricultural activities and/or exploitation of natural resources to generate income streams and maintain livelihoods.

Dependence on rain-fed agriculture

38. At present, the majority of agriculture within the coastal zone is rain-fed and thus crops are subjected to adverse weather conditions and are adversely affected during periods of drought and consequent water shortages during the dry season as a result of the lack of irrigation infrastructure. Indeed, only one harvest of rice is possible within the coastal zone due to the lack of irrigation infrastructure, which limits income streams and contributes to food insecurity. In general, the high dependence on rain-fed agriculture and the lack of appropriate technologies significantly limits agricultural productivity and contributes to the vulnerability of rural Cambodian communities along the coast to climate change impacts. Additionally, agricultural production is frequently not diversified with the main crop being rice, which is a particularly low value crop.

39. Communities along the coast do not have opportunities or the required capacity, technical skills and/or assets to enable them to reduce their dependence on coastal resources or to utilise them sustainably. At the same time, there is a great need to reduce local vulnerability caused by the dependency on a single livelihood source. Communities therefore have to be introduced to alternative livelihoods which can change their reliance on the available natural resources and the only source for their livelihood. Currently, local communities have few coping mechanisms or alternatives to depending on coastal resources.

Unsustainable use of natural resources

40. Poverty levels and the limited alternative livelihood options available in most of the coastal zone contribute to the dependence of rural communities on natural resources, particularly in the mangrove areas where limited land is available for agricultural purposes. Traditionally, coastal communities have relied on mangrove forests as an alternate livelihood (i.e. cutting down the mangroves for charcoal and fuel wood purposes and clearing for agricultural use or for the establishment of salt pans) which has resulted in high levels of mangrove degradation, see paragraph 11. The rapid degradation of mangrove forests has exacerbated the vulnerability of coastal communities to tropical cyclones, strong winds and storm surges by depleting the natural coastal buffering system provided by intact mangrove forests. The incidence of such threats is likely to be increased by climate change.

Weak coordination of coastal development activities

41. Large-scale coastal infrastructure investments often take place in an uncoordinated manner. This can be by either beginning construction before approvals have been obtained or by private developers securing licenses to construct before the completion of relevant feasibility activities. Additionally, there is ambiguity as to what mandate the different ministries have for providing approvals for implementing activities within the coastal zone. Furthermore, poor inter-ministerial coordination results in major development activities being initiated without participation from key national stakeholders. This can also impact on other provincial departments who rely on the same natural resources. Additionally, the private sector stakeholders do not take into consideration climate change impacts when designing and developing coastal infrastructure. At present, no coordinated platform through which to engage these stakeholders in more sustainable practices and to raise their awareness of potential climate change impacts exists. Weak coordination of coastal development activities results in development often occurring in areas where it probably should not as it jeopardizes the effective functioning of beaches, dunes, mangrove forests and coral reefs as a protective barrier to tropical cyclones, strong winds and storm surges by encroaching on important natural ecosystems. This serves to increase the vulnerability of coastal communities and, indeed, infrastructure to tropical

cyclones, strong winds, SLR, storm surges, and related flooding incidents, which are likely to be increased as a result of climate change.

Weak enforcement of policies

42. At the national and provincial level, there is a general lack of enforcement and/or an unclear understanding regarding responsibilities for development and construction activities within the coastal zone. Those legal instruments that do exist are not effectively enforced due to a lack of knowledge and/or capacity of the enforcing authorities and/or lack of financial resources. For example, a major part of the mangroves in coastal zone are found in protected areas or on government-owned land and are therefore under the jurisdiction of the MoE or the Ministry of Agriculture, Forestry and Fisheries (MAFF). However, these mangroves suffer from illegal cutting and other activities, mainly because of the lack of capacity to undertake proper management of the protected areas and insufficient awareness and enforcement. There is a platform through the National Coastal Steering Committee (NCSC) to engage in integrated multi-sectoral planning for the coastal zone, but, at present, this committee only meets occasionally, despite commitments and decisions to undertake an integrated management approach for the coastal zone. The MoE and other institutions in charge of environment management and coastal issues in Cambodia suffer from chronic insufficient human and financial resources. In general, the relevant authorities presently lack the tools or capacity to apply the tools for climate change adaptation. Additionally, there is limited integration of climate change considerations into national policies and programmes[66]. Instead, national policies and programmes focus mainly on post-disaster emergency relief rather than disaster prevention and climate change adaptation[67].

Long-term solutions and barriers to achieving the solutions

43. In the light of the above-mentioned climate change-induced problem and causes, the preferred responses (normative situation) for managing the likely consequences of climate change have been identified, as have the barriers that need to be overcome in order to achieve the normative situation.

Preferred responses

Institutional capacity is strengthened to facilitate effective adaptation planning within the coastal zone and protection of coastal communities, ecosystems and development against climate change impacts

44. The preferred solution would see institutional capacity in Cambodia strengthened in order to facilitate effective adaptive management and adaptation planning within the coastal zone. This would likely entail undertaking extensive capacity building and awareness raising activities with staff from the relevant ministries and departments. Additionally, this would entail the relevant ministries collaborating and sharing information/data to facilitate the identification of effective adaptation measures and plans.

Community and local capacity is strengthened to successfully respond to the climate change risks affecting the coastal zone and coastal agricultural production

45. The preferred solution would see community and local capacity strengthened to effectively respond to and manage the climate change risks threatening agricultural production, livelihoods and natural coastal buffering systems. Communities would be equipped with the appropriate infrastructure (e.g. irrigation infrastructure and agricultural protection measures), technologies and knowledge to respond

[66] NAPA, 2006.
[67] NAPA, 2006.

to the climate change risks threatening agricultural productivity. Furthermore, communities situated near mangrove forests would be equipped with the knowledge and the means to pursue alternative livelihoods and thus, reduce the pressure they had previously placed on mangrove forests.

Agricultural production is protected from climate-related hazards and productivity is improved despite climate change impacts

46. The preferred solution would see agricultural production within the coastal zone improved despite the increased frequency and intensity of flooding and drought events. Water collection and irrigation infrastructure would be installed to allow for a minimum of two harvests of rice each year despite water shortages in the dry season. Additionally, protective measures such as dykes would be improved to combat flooding as a result of storm activity and tidal surges.

47. In order to achieve this, the preferred solution would see improved government spending allocated to coastal agriculture and community development as well as increased awareness of coastal communities and leaders regarding climate change impacts and effective adaptation in the agriculture sector. Additionally, research would be undertaken regarding the introduction of drought-resilient crop cultivars or crops which may be better suited to changing climatic conditions.

Mangrove forests are restored and sustainably managed to effectively provide the full suite of ecological benefits they are capable of delivering

48. The preferred solution would see elimination of unsustainable harvesting and clearing of the mangroves in conjunction with an improvement in rural livelihoods, which would eliminate the need to place unsustainable pressure on mangrove forests. Additionally, the preferred solution would see mangrove forests restored through both an elimination of the anthropogenic pressure placed on them as well as through extensive restoration through re-planting. This would ensure that protective coastal buffer systems are able to effectively reduce the impact of hazardous maritime activities, which are likely to be exacerbated by climate change. Additionally, restoring mangrove forests would impact positively on local fisheries by providing extensive safe breeding and nursery grounds for fishes.

49. In order to achieve this, the preferred solution would see more awareness raising activities regarding the ecological importance of mangrove forests undertaken in the communities dependent on mangrove forests. Additionally, alternative livelihoods would be introduced to improve community income streams and reduce the pressure placed on the mangrove forests.

Barriers to implementation

Limited awareness regarding climate change impacts and adaptation

50. At present, there has been very few awareness raising activities undertaken within the coastal zone regarding climate change impacts and adaptation and there has also been little progress, if any, to build the adaptive capacity of rural coastal communities to cope with current climate variability or the risks associated with future climate change impacts. As a result, coastal communities are ill-equipped with the knowledge and tools to overcome worsening climatic conditions.

Lack of climate-related data

51. The limited collection of climate-related data (largely a remnant of years of political upheaval and conflict) limits effective assessment of climate change impacts on the coastal zone, including

downscaled projections[68]. Additionally, reliable forecasts of extreme weather events are not available in Cambodia[69] and thus such events often find communities largely unprepared. Occasionally information regarding water levels is advertised in public areas but the local people are unsure how to interpret and apply this information[70]. Villagers rely mainly on indigenous communication channels, whereby villagers downstream hear the news of impending weather events from villagers upstream.

52. Additionally, the limited knowledge regarding climate change in Cambodia hampers the assessment of climate change risks within the coastal zone and the integration of such climate change risks into national planning processes. As a result, climate change risks are not mainstreamed and are not considered in national- and local-level development plans (e.g. Commune Development Plans).

Lack of capacity for integrated planning within the coastal zone

53. As a result of previous activities undertaken within the coastal zone, there is a general degree of awareness and understanding, albeit limited, regarding environmental management and the climate change challenges facing the coastal zone among national-level stakeholders. However, there is only a limited understanding of the various aspects of the inherent vulnerability characterising coastal communities. In particular, scientific assessments of the impacts of climate change on water resources availability, sea level, mangrove forests and agricultural productivity in the four coastal provinces are lacking, which hinders effective adaptation planning. Finally, lack of coordination across sectors of government, as well as between government and the private sector, compounded by a lack of resources, prevents the development of a truly integrated management system for the coastal zone.

54. Cambodia, like many other countries, is facing significant barriers and constraints with regard to planning and implementing adaptation efforts, including the lack of the necessary finance and technology. Even if adequate financial and technological resources were in place, capacity to utilise these resources on adaptation in Cambodia as a least developed country is a pressing concern. Therefore rapidly building key capacity is a prerequisite for any successful adaptation effort.

55. The project will contribute to removing these barriers by:

- **Strengthening national institutional capacity** (to be addressed through Outcome 1) - The National Climate Change Committee (NCCC) and the Climate Change Department (CCD) and other relevant line ministries and departments will be strengthened through practical experience gained through the adaptation measures undertaken by the project within the coastal zone (Outcomes 3 and 4). Additionally, the project will improve institutional capacity to undertake effective adaptation planning after the project lifetime (Outcomes 1 and 2). To date, limited efforts by line ministries and departments have been made to take into account the priorities identified through the NAPA process in developing their sectoral strategies.

- **Improving local institutional capacity** (to be addressed through Outcomes 1 and 2) – The Decentralization and Deconcentration policy (D&D, see paragraph 69) has high priority in Cambodia and is allocating more responsibility to local institutions such as provincial and district departments and Commune Councils with regards to natural resources, water resources, land management and agricultural planning. Despite this, the capacity of local institutions involved within the coastal zone remains limited and efforts to develop their capacity have also been limited thus far. The project will improve the capacity of provincial, district and commune leaders

[68] WikiADAPT, 2010. Available from: http://wikiadapt.org.
[69] NAPA, 2006.
[70] NAPA, 2006.

in the four coastal zones to effectively manage climate change risks through a 'learning by doing' process, adequate training exercises, the dissemination of lessons learned and the involvement of such leaders in the project's adaptation measures. Additionally, because local stakeholders remain largely unaware of the potential impacts of climate change, no incentives exist to explore or develop appropriate solutions. This awareness will be established and the necessary technical capacity will be built in the relevant institutions through the project's activities.

- **Strengthening community capacity** (to be addressed through Outcomes 3 and 4) – In order to ensure an effective 'bottom-up' approach to adaptation planning within the coastal zone, the project will involve Commune Councils and Farmer Water User Communities (FWUCs) in managing the adaptation measures piloted by the project. Additionally, the project will undertake awareness-raising activities in vulnerable communities to improve their knowledge related to climate change and adaptation. Furthermore, the project will introduce alternative livelihoods in vulnerable communities in order to improve income streams despite climate change impacts and reduce the reliance of coastal communities on natural resources.

- **Improving inter-ministerial coordination** (to be addressed through Outcome 1) - The creation of the NCCC and the CCD was partly in response to the recognition that there is only limited inter-ministerial coordination in relation to climate change and that their establishment could potentially avoid duplication of efforts between ministries. The project will improve inter-ministerial coordination in particular through the establishment of a data network (see paragraph 109) and involving all relevant agencies in training and capacity building exercises.

2.3. Demonstration sites

56. Four provinces occur within the coastal zone[71], namely Sihanoukville, Kep, Koh Kong and Kampot. The project will pilot adaptation measures in the two coastal districts identified as being the most vulnerable to climate change impacts (i.e. Prey Nup district in Sihanoukville province and Koh Kong/Peam Krasaop district in Koh Kong province). However, leaders and community members from all four of the coastal provinces will be engaged in the project's capacity building activities and dissemination of lessons learned to improve adaptive capacity and adaptation planning across Cambodia's coastal zone. Prey Nup and Koh Kong/Peam Krasaop districts were selected as pilot districts during consultations between the Ministry of Environment (MoE), provincial and district authorities from the coast, the CCD and the national and international consultants (see details in Appendices 18 and 19). Their selection was based on the fact that both areas border the shoreline and largely consist of low-lying land (in which agricultural activities are concentrated), and consequently are highly vulnerable to tropical cyclones, SLR (and related saline intrusion), storm surges and related flooding incidents. Additional site selection criteria included the incidence of poverty, which was measured using poverty-related indicators included in the State of the Coastal Environment Report[72] (e.g. the number of houses with thatch roofs, types of housing, proportion of households with televisions and motorbikes, number of households without access to drinking water within a 150 m radius and the number of households farming on less than 0.1 ha).

[71] Cambodia is subdivided into 23 provinces, which are divided into districts and municipalities. Districts are made up of a number of communes and quarters and further divided into villages whilst municipalities are divided into quarters, which are divided into villages and then further divided into groups (National Strategic Development Plan Update 2009 – 2013).
[72] MoE, 2004.

57. Additionally, Prey Nup is one of the largest rice-growing regions along the coast, with most of the agricultural land being situated in particularly low-lying areas and protected from maritime activity by a series of dykes whilst Koh Kong houses the largest mangrove forests. (Further details regarding the pilot districts are included in the bullet points below.) Thus, the two districts are appropriate for testing adaptation measures for protecting both agricultural fields and mangrove forests from climate change impacts.

58. The selection of these two sites was endorsed by the stakeholders present at the consultation workshop held on 16 March 2010, which included stakeholders from all provinces (see Appendix 19). Subsequent to the identification of the pilot districts, workshops were held in both Prey Nup and Koh Kong during June 2010 with community leaders in order to identify adaptation measures to be piloted by the project and sites within each district. Appendix 18 contains the outcomes and minutes of those workshops. Experience from the demonstration sites will enable upscaling and facilitate replication in other high risk areas identified, for example, through the vulnerability mapping exercises undertaken by the project.

- **Prey Nup District** consists of 18,444 households with 93,141 people. This district is located in a particularly low-lying area with a total of 10,000 ha dedicated to rice production, which is protected by a dyke system. This dyke system was rehabilitated over a four year period through funds from French Development Agency (AFD) after which local Farmer Water User Communities (FWUCs) were established to maintain the dyke system, which often require maintenance as certain areas have been undergoing extensive sinking[73]. Members of the local community reported[74] that rice cultivation practices were affected twice by floods during 2009. The first flood resulted from heavy rainfall within the catchment in August, while the second flood was caused by tidal activity in November. This damaged approximately 850 ha of rice crop. Significant maintenance is required on the dykes as a result of the flooding and the sinking. Apart from the floods, storm surges took place in October and November. It was reported that heavy storms occurred many times in 2006 and 2007, which also caused significant damage to the rice fields.

- **Koh Kong District (Peam Krasaop**) in Koh Kong Province. The district consists of 1,597 households with 7,356 people. In the vulnerability assessment for the INC this was identified as one of the most vulnerable areas along the coastline. The area has been affected by floods every year in November/December. The commune was flooded last year (2009) by seawater to a height of approximately 0.5-0.8 m. The flood lasted from three to five days, which was contrary to the previous years (in which floods lasted only three to four hours). The cost of damage was not quantified, but it was reported at a community workshop that the flood had severe impacts on crops and rural infrastructures. After being flooded by seawater, the land cannot be used for crop cultivation until heavy rains have fallen to flush out the salt. The commune is partly protected from the sea water dams, but the dykes are lower than the level of seawater during the flood season. Most people living in the commune are mainly dependent on marine fisheries.

2.4. Global significance

59. The project area encompasses ecologically important mangrove forests, coral reefs and seagrass beds (see Section 2.1), which house certain particularly vulnerable animal species, including the dugong

[73] This is often the case because the dykes are situated on the edge of mangrove forests and thus sink as a result of the soft mud associated with mangrove forests.
[74] Outcomes of local level stakeholder consultations (district name, community name, month, year).

(which is currently listed as vulnerable to extinction), the Irrawaddy dolphin and the saltwater crocodile. Although the project will focus directly on rehabilitating mangrove forests, the activities undertaken will, in so doing, indirectly contribute to the protection of coral reefs and seagrass beds (see point iv below).

60. The project will pilot mangrove reforestation in one of its demonstration sites, Peam Krasaop/Koh Kong District and will promote awareness regarding the protection of mangrove forests across the four coastal provinces. In this way, the project will contribute to the protection of one of the world's most fragile and, indeed, important ecosystems. By rehabilitating mangrove forests, the project will contribute to: i) improving local fisheries[75] with commercial, local and ecological benefits; ii) increasing the protective buffer offered by mangrove forests against tropical cyclones, strong winds, SLR, storm surges and related flooding incidents, and thereby reducing coastal erosion and damage to coastal infrastructure; iii) reducing greenhouse gas emissions with global benefits (e.g. improve mitigation of climate change); and iv) protecting coral reefs and seagrass beds from smothering as mangroves capture terrigeneous sediment flowing out to sea. The importance of the mangrove forests in Koh Kong with regards to biological diversity both nationally and internationally, for example, is highlighted by the fact that the area has been declared a wildlife sanctuary which may be transformed into a Marine Protected Area.

2.5. Institutional, sectoral and policy context

Institutional, sectoral framework

61. Cambodia ratified the United Nations Framework Convention on Climate Change (UNFCCC) on 18 December 1995 and accepted the Kyoto Protocol on 22 August 2002. Cambodia's INC to the UNFCCC was submitted in October 2002 and the preparation of the Second National Communication (SNC) began in January 2007 and should be finalised by the end of 2010. The Royal Government of Cambodia (RGC) has taken a firm stance to support the Kyoto Protocol by indicating their commitment to addressing climate change risks and the MoE is the lead coordinating institution with the mandate to address climate change concerns. Additionally, to ensure effective and successful implementation of sustainable development-related programmes, the RGC has established a number of cross-sectoral national committees, such as the NCCC established in 2006 and chaired by MoE with the Prime Minister as honorary chair. The NCCC serves as a policy-making body (comprising policy-makers from 19 ministries), which coordinates the development and implementation of plans, policies and measures to address climate change risks across Cambodia[76]. As such, the NCCC is the focal point for all climate change-related engagement within the RGC. Furthermore, the MoE established a Climate Change Office in 2003, which was changed to the CCD in 2009 and serves as a secretariat for the NCCC. The CCD has the mandate to implement the UNFCCC and Kyoto Protocol by creating an enabling environment for effective climate change mitigation and adaptation. The National Coastal Steering Committee (NCSC) was established in 1997 and the committee to study and evaluate illegal encroachment on and clearance of mangrove land and reclamation of the seaside was established in 2005. These two committees might represent relevant platforms for coordination of coastal area development plans and management; however, their mandate and technical capacities/human resources are still not strong enough to be fully effective. Additionally, a Coastal Coordination Unit (CCU) was established within the MoE in 1997 and functions as the secretariat for the NCSC. The CCU has received extensive capacity building support through the Danida coastal

[75] Mangrove forests serve as nursery grounds for fish and other marine animals (e.g. mangrove crab, shrimps, sponges, barnacles, algae, oysters and other crustaceans).
[76] WikiADAPT, 2010. Available from: http://wikiadapt.org.

project (see Section 2.7) since its inception and has become increasingly responsible for the implementation of projects along Cambodia's coastal zone.

62. The NCCC has the mandate to establish a Climate Change Technical Team, to provide itself with technical expertise. This team is yet to be established, but the process has been initiated. Several ministries including the MAFF, the Ministry of Water Resources and Meteorology (MoWRAM) and the Ministry of Health (MoH) have been awarded specific climate change mandates. Additionally, certain ministries have established climate change units, such as MAFF, which has established a unit to work specifically on work related to Reducing Emissions from Deforestation and Forest Degradation (REDD).

63. At the national level, the government agencies with responsibilities related to climate change, natural resources and coastal ecosystem management and development include:

- The **Ministry of Environment** (MoE), which was established in 1993 and is responsible for environmental protection and natural resources management in Cambodia. As mentioned above, the MoE created a CCD, which serves as a secretariat to the NCCC. The MoE acts as the Designated National Authority (DNA) for the Clean Development Mechanism (CDM) of the Kyoto Protocol.

- The **Ministry of Agriculture, Forestry and Fisheries** (MAFF), which has an extensive network of staff at the national, provincial, district and commune levels. The Fisheries Administration (FiA) has the mandate for the management of all activities related to fisheries, including artisanal, mangroves, seagrass and industrial fisheries. In practice, the MAFF has the responsibility for day-to-day management of most of the coastal resources, without the general co-ordinating mandate for overall environmental management. Given this broad mandate, there is substantial overlap with the MoE in the perception of functions and responsibilities. Regarding policy, the 2006-2010 Strategic Agriculture Development Plan does not consider climate change adaptation and mitigation.

- The **Ministry of Water Resources and Meteorology** (MoWRAM), which has the responsibility of observing and managing all activities related to water resources and meteorology development and natural disasters. This includes the: i) rehabilitation of irrigation infrastructure; ii) mitigation and management of drought and flood; iii) management of hydrology and meteorological basic information systems; and iv) development of human resource for agriculture production. The law on water resources management, regulations and policies was signed by the King on 29 June 2007. Additionally, the MoWRAM signed a Memorandum of Understanding (MoU) regarding the sharing of responsibility over the management of the Prey Nup polders[77] with the Sihanoukville provincial authority and the Farmer Water User's Communities (FWUC) of the Prey Nup polders.

- The **Ministry of Land Management, Urban Planning and Construction** (MLMUPC), which is responsible for the formulation of development plans and land use plans at the national- and local-levels. The commune land use planning is the main task of MLMUPC, which includes defining land use in the communes, including state and private land.

  The MLMUPC has developed the action plan focusing on community land use planning in 10 target areas including three of the coastal provinces (namely: Kep, Koh Kong, and

[77] A polder is the name given to an area along the coastal zone which is particularly low-lying and thus is affected by tidal action. However, polders are protected by sea water by dykes which have been constructed in these areas.

Sihanoukville), which they are planning to expand to Kampot in 2010/2011. Natural resources management maps and land use maps have also been produced at the local level. At the provincial level, MLMUPC produced maps of sensitive or hot spot areas that should be protected from development. MLMUPC has also developed a National Strategy on Coastal Zone Sustainable Development and the master plan for the Sihanoukville province, which include information regarding urban land use and flood control.

- The **National Committee for Disaster Management** (NCDM), which was established in 1995, is an inter-ministerial body chaired by the Prime Minister. The members of the committee are drawn from all concerned ministries and the armed forces. NCDM plays a key role in disaster management, working both on disaster risk reduction/prevention and response preparedness. In this regard, NCDM coordinates with the ministries of the RGC, UN agencies, NGOs, International Communities, National Associations, and Local Donors in order to appeal for aid for Emergency Response and Rehabilitation. In addition, the NCDM recognizes the impacts caused by climate change.

- The **Ministry of Industry, Mines and Energy** (MIME), which is responsible for planning industrial water use and hydropower as well as water supply provision to provincial towns and administrating single-purpose schemes involving hydro-power. Additionally, the MIME has a long history of promoting renewable energy and energy efficiency.

- The **Ministry of Public Works and Transportation** (MPWT), which is responsible for construction of roads, infrastructure e.g. bridges and ports. Recently, MPWT prepared a five year master plan for roads and ports. However, climate change concerns have not been considered in the master plans of roads, ports, sewage and waste water treatment systems. MPWT constructed the wastewater management system in the Sihanoukville Province and has begun undertaking a feasibility study on wastewater management in the Kep Province. Neither of these projects considers climate change concerns.

- The **Ministry of Rural Development** (MRD), which is responsible for: i) supplying small-scale water supply infrastructure to households; ii) primary health care; and iii) small-scale infrastructure in the rural areas in Cambodia. Although the MRD recognizes the importance of adapting to climate change, the strategic plan of the MRD does not consider climate change adaptation and mitigation.

- The **Ministry of Health** (MoH), which is responsible for the development of the health sector for better health and well being of Cambodians and thus contributes to poverty alleviation and socio-economic development. The Health Strategic Plan (2008-2015) of the MoH does not consider climate change impacts. However, the MoH has been cooperating with the World Health Organisation (WHO) to prepare an action plan for health and climate change, which is in a draft form awaiting approval by the RGC.

- The **Ministry of Tourism** (MoT), which aims to preserve the scenic beauty and natural resources of the coastal zone without compromising communities within the coastal zone by introducing ways of earning their livelihoods that are not harmful to the environment. Thus, proper management and regulation of tourism development is particularly important in balancing these competing interests. Tourism provides major economic benefits to the country through employment creation, rural development, foreign exchange and tax revenues. Even though tourism offers great economic potential for the coastal zone being a popular destination for local

and international tourists, local communities also depend on the same coastal zone resources for their livelihood.

- The **Council for the Development of Cambodia (CDC)**, which is the principle contact between the RGC and all donor countries, organisations and NGOs working within Cambodia. As such, the CDC is the decision-making body for all major donor investments undertaken within the country, including those in coastal areas. All environmental projects are entitled to incentives under the investment law, and all project applications must include an Environmental Impact Assessment as part of the project's feasibility study.

64. All these key stakeholders have expressed strong interest in involvement in the project's implementation. Additional information regarding these stakeholders obtained during the consultations held during the PPG phase is contained with Appendices 18 and 19.

65. The Cambodia Development Cooperation Forum (CDCF) provides government, donors and civil society with an opportunity for dialogue on public policy processes and the associated government financing framework in the context of the National Strategic Development Plan (NSDP, 2006 - 2010). The Government-Donor Coordination Committee (GDCC) is the operational arm of the CDCF, providing a mechanism for in-country coordination, review and monitoring to ensure optimal and effective utilisation of all external assistance and funds from the RGC to achieve the desired impact of meeting overall goals and targets specified in NSDP. Under the GDCC are 18 Technical Working Groups (TWGs). A TWG specifically targeting climate change does not currently exist. However, interaction with certain of the TWGs will be undertaken during project implementation. Specifically, the project team will likely interact with the following TWGs:

- The Technical Working Group on Forestry and Environment (TWGFE), which is coordinated by external donors (Danida, DFID, EU, FAO, JICA and WB) and three ministries (MAFF Forestry Administration, MoE and MLMUPC) with the aim to support and strengthen forestry and environmental development to contribute to economic growth, food security, increased employment and poverty reduction.

- The Technical Working Group on Agriculture and Water (TWGAW), which is coordinated by external donors (ADB, AFD, AusAID, CIDA, EU, FAO, GTZ, IFAD, JICA and WB) and two ministries (MAFF and MoWRAM) and aimed at "identifying sector priorities, harmonizing activities, improving the utilization and mobilization of resources and supporting efforts to strengthen the agriculture and water sector's capacity to contribute to economic growth".

Policy framework

66. Although the RGC has taken a firm stance to support the promulgation of the Kyoto Protocol, current national policies and programmes do not address anticipatory climate risk management and long-term climate change adaptation. In general, policies and programmes of MoE, MAFF, MLMUPC and MoWRAM do not incorporate climate change projections and scenarios into current plans and strategies.

67. Since the implementation of the Socio-Economic Development Plan (SEDP) II in 2001[78], two important developments have taken place. Firstly, following the United Nations Millennium Summit in 2000 (which declared that 10 broad Millennium Development Goals, MDGs, were to be achieved by all countries by 2015), Cambodia developed its own set of MDGs called Cambodia Millennium

[78] The SEDP II focuses on poverty reduction and economic growth.

Development Goals (CMDGs) focusing on poverty alleviation and human development[79]. These are among the RGC's highest priorities, and were arrived at by a highly consultative process. Secondly, the country's first National Poverty Reduction Strategy (NPRS) was prepared and adopted in December 2002, which emphasises the RCG's commitment to reducing poverty and inequality. Additionally, a Rectangular Strategy (RS) for growth, employment, equity and efficiency was adopted in 2003 following the third general elections. The RS includes a combination of the key elements from *inter alia* the SEDP II, the CMDGs and the NPRS. The main focus of the RS includes: i) promoting economic growth; ii) generating employment; iii) promoting equity and social justice; and iv) enhancing the efficiency of the public sector[80].

68. In June 2006, the NSDP (2006-2010) was endorsed by the Council of Ministers. This plan was organised using the RS framework and clearly articulates the RGC's objectives of national economic growth and poverty reduction. The plan's goals regarding preservation, conservation and sustainable use of all natural resources of the country, including biodiversity, are not only to conserve Cambodia's unique natural heritage but also to enhance environmental sustainability and to contribute to sustainable economic growth, poverty reduction and improvements in the lives of rural communities. The top priorities of the NSDP (2006 – 2010) include improving the lives and livelihoods of the rural poor. The NSDP (2006 – 2010) also acknowledges that accelerating poverty reduction in Cambodia is largely based on improving agricultural productivity and income. As a result, one of its key commitments is to develop a resilient and productive agriculture sector. Climate change concerns are not directly incorporated into the NSDP (2006 – 2010) although the plan does encourage improved resource mobilisation to support the implementation of NAPA priorities, which are in response to climate change impacts. A revision of the NSDP was undertaken in 2009 and the revised version (NSDP, 2009-2013) places focus on climate change and acknowledges the effect climate change impacts are likely to have on Cambodia. Indeed, climate change is recognised as one of Cambodia's key development priorities in the updated NSDP. Additionally the updated NSDP recognises that factors such as climate change and the global economic downturn hamper the effective implementation of plans such as the updated NSDP. As such, the implementation of the NSDP will require periodic adjustments in budgetary allowances to address the challenges encountered. Overall, the updated NSDP highlights the RGC's priority policies and presents a roadmap for their effective implementation.

69. The National Programme for Sub-National Democratic Development (NP-SNDD), a programme of the National Committee for Sub-National Democratic Development (NCDD), is the RGC's ten-year strategy and implementation programme through which the RGC will achieve substantial progress toward its strategic vision of decentralization and de-concentration (D&D) as elaborated in the Strategic Framework for D&D reforms and the Law on Administrative Management of Capital, Province, District, Municipality and Khan, and the Law on Administrative Management of Commune/Sangkat. The vision of the RGC's D&D reforms have been outlined in various key government policy papers including the RS, NSDP, the Strategic Framework on D&D Reforms and most importantly in the Law on Administrative Management of Capital, Province, District, Municipality and Khan, and the Law on Administrative Management of Commune/Sangkat.

70. The purpose of the ten-year NP-SNDD is encapsulated by the RGC's objective: "to develop a management system of sub-national government that will operate with transparency and

[79] The RGC recognized unexploded ordinance (UXO), victim assistance and the number of live mines in the country as a significant hindrance to development. As such, the RGC added a ninth MDG to its list, namely "De-mining, UXO and victim assistance". In addition, the CMDGs set up monitoring indicators for environmental sustainability with the focus on people's participation in the management of natural resources.

[80] National Strategic Development Plan Update, for 2009 – 2013.

accountability in order to promote local development and delivery of public services to meet the needs of citizens and contribute to poverty reduction within the respective territories." The following four programme areas are to be implemented in three phases building on lessons learned in each of the phases over a ten-year period beginning 2011:

- Sub-National Organization Development.
- Human Resource Management and Development System.
- Transferring of Functions.
- Finance, Budget, and Asset Management.

71. The first phase of the NP-SNDD is currently being finalised by NCDD in the 3-year Implementation Plan (IP3). The following encapsulate the basic principles guiding the reform of the sub-national governance system[81]:

- "*Democratic Representation: Strengthen local councils which are democratically elected (either directly or indirectly) and expand their powers, responsibilities and resources.*
- *Popular Participation: Introduce systems and procedures for people's participation in decision-making at all levels of the sub-national governance system.*
- *Public Sector Accountability: Strengthen the accountability of public administration at all levels and facilitate people's oversight of the administrative and financial performance.*
- *Effectiveness: Bring providers of services closer to the users and allow users to participate in the planning and monitoring of public services delivery in order to make availability of public services responsive to local needs and priorities.*
- *Efficiency: Improve the administrative system, coordination, and management capacity of the sub-national governance system to improve quality and access to public services at all levels.*
- *Poverty Focus: Enhance the capacity of integrated territorial authorities at all levels to better target public expenditures to eradicate poverty by focusing on vulnerable groups and to achieve Cambodia's Millennium Development Goals*."

72. The project will closely follow the NP-SNDD and the IP3 and will utilise the capacities of the sub-national governance system and the NCDD reform process. The project will focus on building and/or enhancing the technical and decision-making skills and capacity of government staff at the provincial level[82], therefore fitting well within the D&D efforts of the government, specifically under the "human resources management and development system" programme area. The project will, where possible, use the existing and emerging governance systems and the NCDD mechanisms for implementation, especially with regards capacity development and the adaptation measures. Furthermore, the project will contribute to the abovementioned basic principles by: i) strengthening local councils (e.g. Commune and District Councils) and committees (e.g. FWUCs) through *inter alia* their inclusion in capacity building activities and in the identification of additional adaptation measures and in their participation as management committees for the adaptation measures (see paragraph 129); ii) incorporating climate change considerations in the Commune and District Development Plans (including Investment Plans) for coastal communes following extensive collaboration with Commune and District Councils; iii) involving sub-national (provincial) institutions in capacity building and lessons learned dissemination activities; iv) alleviating poverty in

[81] The National Committee for Sub-National Democratic Development homepage, available from: http://www.ncdd.gov.kh/dnd-basic-principles-menu. Accessed: 30 July 2010.

[82] Including representatives from, but not limited to: the MAFF, MIME, MLMUPC, MoE, MoH, MPWT, MRD, MoWRAM, National Committee for Disaster Management (NCDM), Ministry of Women's Affairs (MoWA), Fisheries Administration, Department of Coastal Zones and Wetlands, Coastal Coordination Unit (CCU), General Department of Administration for Nature Conservation and Protection and CCD.

the demonstration sites through the reduction of vulnerability to climate change impacts as well as through the improvement of livelihoods and agricultural production despite climate change impacts; and v) involving provincial institutions in coastal climate change adaptation planning.

73. The National Biodiversity Strategy and Action Plan is aimed at ensuring the protection of mangrove forests and coastal zones in general, facilitating community participation in coastal resource planning and management, reforesting of mangroves, and preparing and implementing management plans (including land use) for mangrove areas.

74. Within the Agricultural Sector Strategic Development Plan (2006-2010), the MAFF set out specific sectoral objectives to achieve the overall goal of "poverty reduction and economic growth through enhancement of agricultural sector development". The planned activities to achieve the objectives have been detailed and require a budget of US$ 153 million. Of the total amount of budget, US$ 400,000 was set aside for ensuring proper management of mangrove forest resources within the coastal zone.

75. The goal of the current National Development Framework is to "achieve and ensure food security and conserve the natural resources". In order to achieve this objective with regard to wetlands and natural resource management, the RGC has proposed the following agriculture policies/strategies[83]:

- To create a favourable environment conducive to private sector participation in the agriculture sector by accelerating land distribution and the issuance of security land titles within social land concession.
- To improve irrigation facilities and water resources management by improving the existing irrigation systems and establishing and strengthening of farmer water communities in order to reduce the effects of natural disasters.
- To promote distribution of farming inputs including seeds, fertilizers and rural credit in order to increase agricultural productivity.

76. In order to achieve the NSDP (2006-2010) as well as MAFF's goals, MAFF aims to implement a total of 96 actions/programmes within the period of 2006-2010. However, not all of the activities are nationally funded. The main 11 actions/programmes which consider integrated farming, water resources, and community-based natural resources management, are as follows[84]:

- Improve 100,000 ha of irrigation systems in potential production areas of irrigated and rain-fed areas.
- Improve and promote rice and other crops intensification by using integrated crop management, IPM and SRI techniques (aim to reduce the use of agro-chemicals);
- Implement a participatory water management programme in existing irrigation systems (in 20% of cultivated area).
- Promote an integrated farming system programme combining cropping systems, agro-forestry, crop-livestock and fish culture.
- Develop legislation frameworks and mapping of agricultural land use planning.
- Strengthen agricultural land concession management.
- Develop a national land use master plan and provincial and community land use plans.
- Promote community-based land use planning.
- Promote a community-based forestry management programme.

[83] MAFF, 2005a, p. 15.
[84] MAFF, 2005a, p. 19-28.

- Promote reforestation and rehabilitation of degraded forest areas.
- Develop a programme for protected and conservation forest areas including watershed management.

77. Based on the RS, the National Water Resources Policy (NWRP) was formulated by MoWRAM in 2004. This policy covers all water resources. Water for agriculture was given high priority in the NWRP, and the following five aims have been identified[85]:

    - To provide farmers with the quantity of water they need, when and where they need it, and within the limits of available water resources and technology.
    - To promote the rehabilitation and construction of irrigation, drainage, and flood management infrastructure.
    - To promote the development and extension of appropriate water management technologies such as water harvesting, improvements to the moisture-holding capacities of soils and use of farm ponds.
    - To strengthen and expand FWUCs, to enable them to participate in water management and allocation and to maintain irrigation infrastructure with effectiveness and sustainability.
    - To minimize the impact on the water resources caused by the uses of chemical substances in agricultural production by encouraging people to implement diversified agriculture.

78. The Strategic Development Plan for the Water Sector (SDP-WS) presents MoWRAM's planned objectives, outputs and activities during the period 2006-2010, and constitutes MoWRAM's input to the updated NSDP. MoWRAM has a mandate to manage all aspects of Cambodia's water resources as well as to ensure that there is a sustainable basis for socio-economic development in water-related sub-sectors such as urban and rural water supply, electric power generation, and fisheries. MoWRAM has been instructed to place a particular emphasis on the management and control of water for agricultural production. The SDP-WS therefore includes many elements that relate to this area of activity. Five principle working themes are identified in the SDP-WS, two of which support communities in order to contribute directly to achieving National Priority Goals as part of the RS. The others seek to develop MoWRAM's capacity to carry out its mandate.

Cross-sectoral policies

79. Based on the NSDP (2006-2010), the NPRS, the RGC's Strategic Framework for D&D Reforms and existing sectoral strategies, a proposed Medium-Term Strategy for Agriculture and Water (2006-2010) has been formulated by members of TWGAW. This strategy was approved by the Minister of MAFF and MoWRAM on 30 March 2007 and incorporates five main programme areas, namely: i) The Institutional Capacity Building and Management and Support Programme for Agriculture and Water Resources; ii) The Food Security Support Programme; iii) The Agricultural and Agri-business Programme; iv) The Water Resources, Irrigation and Land Management Programme; and v) Agricultural and Water Resources and Land Management Programme. Overall, the strategy aims to contribute to poverty reduction, food security and economic growth through: i) enhancing agricultural productivity and diversification; and ii) improving water resources development and management. This will be achieved principally by: i) more efficient use and management of water and land; ii) increased agricultural productivity; and iii) institutional capacity building.

80. The Water, Irrigation and Land Management Programme aims to assist farmers and rural communities to improve food security and income generation, reduce vulnerability, increase surplus

[85] MoWRAM, 2004, p. 6.

of agricultural products for processing and exports, and promote sustainable management and development of land, irrigation and water resources. Cambodia has also adopted the concept of participatory irrigation management in recognition of the need for community participation and ownership of irrigation schemes in order to improve the performance of irrigation systems and to achieve operational sustainability and economic development. The Participatory Irrigation Management and Development (PIMD) programme is helping to develop national policy in this regard.

81. The project will contribute to the objectives and aims of the abovementioned policies and strategies by improving ecosystem resilience to climate change impacts, improving agricultural production (and thus food security) despite climate change impacts, improving the income streams and diversifying livelihoods of rural communities along the coast as well as by strengthening capacity at all levels (national, provincial, district and community) to effectively adapt to and overcome the impacts climate change is likely to have on the Cambodian coastal zone.

Legislative framework

82. The law of **Environmental Protection and Natural Resource Management (1996)** contains very broad statements of general principles to protect natural resources and the environment. The law covers National and Regional Environmental Plans (3 articles), Environmental Impact Assessments (2 articles), Natural Resources Management (4 articles), Environmental Protection (2 articles), Monitoring (2 articles), Public Participation (3 articles), Environment Endowment Fund (1 article), and Penalties (5 articles). This is one of the most important laws relating to the coastal zone. It places the natural resources of the country under the jurisdiction of the MoE and empowers MoE to set environmental standards.

83. The law of **Land Management, Urban Planning and Construction (1994)** establishes a process for land use and planning at both the national and local levels. Appropriate land use and planning are essential to protecting the coastal zone from over development, and from destruction of the natural environment.

84. The Decree Law (Kret Chhbab) **Fishery Management** (1987) protects the marine and freshwater habitats, ecosystems and fisheries and ensures effective management of all fisheries and fishing activities. This law also informs all fishery regulations, permit conditions, fishing rights and compliance enforcement.

85. The Decree Law (Reach Kret) **Protection of Protected Areas (1993)** informs the designation of parks, wildlife preserves and related areas as protected areas, and aims to preserve these areas as part of the nation's heritage. Specific to the coastal zone, this is crucial to maintaining ecosystem integrity and functions.

2.6. Stakeholder mapping and analysis

86. In order to develop a project reflective of the needs of Cambodians and to foster ownership of the project, the project document was based on information from extensive stakeholder consultations. These consultations included meetings with eight key ministries and their NCCC members, eight development partners, four province governors and provincial departments in two provinces, two community workshops and a national consultation seminar. The consultations took place in the period from late January to mid-June 2010. Details regarding stakeholder consultations are included in Appendix 19. Information regarding consultations held in order to facilitate the selection of sites and

adaptation measures is included in Appendix 18. Details regarding stakeholder participation in the project implementation are given in paragraph 188.

2.7. Baseline analysis and gaps

Outcome 1: Institutional capacity to assess climate change risks and integrate them into national development policies strengthened.

Baseline situation

87. At present, the level of institutional capacity to effectively manage natural resources and ecosystems within the Cambodian coastal zone is limited and is insufficient to successfully adapt to present climate change impacts and future climate change risks. Of particular concern is that it is unclear which institution is primarily responsible for land use planning and management of natural resources within the coastal zone. Additionally, inadequate human capacity and insufficient technical and financial capacity render it difficult for institutions to undertake this planning and management. At the national level, a very limited number of staff members within ministries have such capacity due to insufficient training and a limited understanding of climate change and its impacts. This is also the case regarding capacity at the provincial level where on-the-ground delivery of technology, knowledge and enforcement is meant to occur. The NCCC is a formal coordinating committee which was established in order to ensure a coordinated approach to manage the cross-sectoral nature of climate change impacts but this committee does not meet on a regular basis and it has a limited influence on government policy and action.

88. As mentioned above, Cambodia has limited technical experience and capacity to undertake effective climate change adaptation within the coastal zone. To date, the majority of the capacity development that has taken place has focused predominately on the broader aspects of climate change, such as reporting to UNFCCC and the CDM, rather than enabling the identification of climate change vulnerabilities, forecasting and adaptation planning. Similarly, most of the ongoing programmes in Cambodia related to climate hazards focus on reactive emergency relief rather than on forward-looking risk reduction, preparedness and adaptation.

Outcome 2: Adaptation planning in the coastal zone improved.

Baseline situation

89. The policy framework for coastal zone development is weak and inadequately enforced which compromises the resilience of coastal communities and natural ecosystems to climate change impacts. For example, coastal development takes place without consideration of setback lines and zoning, which renders coastal communities, ecosystems and infrastructure more vulnerable to a climate change-induced increase in tropical cyclones, SLR, storm surges and related flooding. Furthermore, these lines and zoning are not determined based on climate change knowledge. Presently, extensive development[86] (related to infrastructure, water resources and irrigation) has been carried out in the coastal provinces, without consideration of climate change impacts and future climate change risks. This development is largely private-funded and the approval process is unclear as a result of limited capacity for the execution of Environmental Impact Assessments and limited enforcement. At present, no mechanism exists for climate-proofing these projects. Overall, high-level challenges for the government in the management of climate change impacts and risks include a lack of tools and

[86] Information relayed to the project team during consultations held with MPWT between 25 January and 12 February 2010 (see Appendix 19).

information for climate-proofing development planning, particularly regarding the integration of climate issues into national-level planning; provincial-, district- and commune-development plans; and disaster-risk reduction plans.

90. Although the NCDM, in collaboration with the International Strategy for Disaster Reduction (ISDR) and the Asian Disaster Preparedness Centre (ADPC), carried out assessments of certain local communities within the Kampot and Sihanoukville Provinces in order to ascertain their vulnerability to natural disasters, the extent of these assessments was limited by funding and it was thus not possible to extend the assessments to the other two coastal provinces or to extend the scope of the assessments to include vulnerability to climate change[87]. As a result, detailed vulnerability assessments for coastal communities and ecosystems are presently not available for Cambodia.

Outcome 3: Vulnerability of productive systems to increased floods reduced.

Baseline situation

91. Adaptive capacity is low within rural communities along the coast, which is largely attributable to high poverty levels. Poverty limits the ability of communities to change present behaviour and adopt new approaches to overcome climate change impacts. This is evident in the fact that 17% of community members interviewed regarding coping strategies (see paragraph 24) did not alter their planting regimes in response to episodes of floods and droughts and 24% of interviewees organised religious ceremonies to cope with the adverse conditions.

92. Regarding agricultural activities within the coastal zone, the majority of such activities are concentrated within particularly low-lying areas and are thus frequently hampered by flooding and tidal activity/storm surges. Protective dams are in place to prevent the occurrence of seawater flooding as a result of tidal activity and/or storm surges but the walls of these dams are often not high enough to protect the fields from floods during the wet season. Similarly, the height many of the dykes in place to protect agricultural fields is too low to effectively protect against increased cyclonic activity, SLR, storm surges and flooding as a result of climate change. Thus, agricultural productivity is frequently subjected to adverse climatic conditions due to inappropriate protective measures.

Outcome 4: Resilience of coastal buffers to climate change increased and livelihoods improved.

Baseline situation

93. Mangrove forests within the Cambodian coastal zone have been significantly reduced as a result of human pressures. Indeed, mangrove cover within the coastal zone has been reduced by over 7,700 hectares (or 12%) between 1997 and 2005[88] despite efforts to reduce pressure on mangrove systems. Other studies estimate the decline to be approximately 25% between 1993 and 2005[89]. Mangrove cover within Koh Kong Province, the province in which the project will improve the resilience of coastal buffer systems, has been reduced by over 700 hectares as a result of anthropogenic pressures. Mangrove clearing is an unsustainable livelihood option within the coastal zone which is undertaken largely for firewood or charcoal production. Additionally, clearing is often as a result of investment activities, such as saltpans, land reclamations and intensive shrimp aquaculture. Furthermore, SLR will adversely affect mangrove functioning by upsetting the saltwater concentration of the estuarine waters that mangrove species depend on, which may lead to further degradation of mangrove forest.

[87] Information obtained when the project team met with NCDM during the PPG phase (see Appendix 19).
[88] JICA 1997 Land Use Data; MoE 2002 and 2005 Interpretation.
[89] JICA 1997 Land Use Data; MoE 2002 and 2005 Interpretation.

Degradation of the mangroves reduces their efficacy as natural coastal buffering systems against tropical cyclones, strong winds, SLR and storm surges and thus their ability as erosion control measures. Economic impacts are also felt as a result of mangrove degradation, due to their role in the survival of numerous commercial fish species and other marine organisms. As a result, it is necessary to identify sustainable and alternative livelihood options to reduce current pressure levels placed on the mangroves.

94. Baseline investments regarding mangrove restoration within the coastal zone include the Participatory Management of Mangrove Resources (PMMR) project, which was implemented by MoE and the International Research Centre-Canada (IDRC). The PMMR project focuses on sustainable community-based natural resources management through: i) strengthening human capital; ii) improving the value of resources and local livelihoods; iii) working on cross-commune resources management and sharing and adapting lessons from the research. The PMMR project began in 1990 in one of Cambodia's 23 protected areas, the Peam Krasaop Wildlife Sanctuary in the Koh Kong Province, and has experienced great success. The core priorities of the PMMR project include: i) sustainable use of coastal resources, particularly the mangrove forests; ii) adaptive learning about both the community-based natural resource management and the co-management concepts for community management plans; iii) enhancing grassroots ownership of the resource management process; iv) improving distribution of resources; v) diversifying local options to assist in securing sustainable livelihoods; vi) encouraging powerless people and working towards a gender balance in all activities; vii) promoting change in the legal and policy frameworks that affect community-based natural resources management; and viii) sharing research lessons with both horizontal (other ministries and NGOs) and vertical (line departments) institutions. The experience obtained and the lessons learned from the PMMR project will be built upon and used by the project particularly when establishing work relations with the local communities in the mangrove rehabilitation demonstration sites.

Overall

95. Recent relevant projects/programmes undertaken within the coastal zone are documented in Section 2.8. The project will utilise the lessons and build upon the capacity established through these projects when implementing its activities and will aim to climate-proof their investments within the coastal zone, where appropriate and relevant. This is particularly so for the Danida-funded project 'Environmental Management within the coastal zone'[90], which was underway between 1997 and 2008 and built up capacity and piloted effective management of natural resources over a decade. The implementation of the project will build heavily on the experiences and lessons learned regarding capacity development during the implementation of the Danida-funded project on Environmental Management within the coastal zone over the past decade. Phase 3 of the project was started in August 2002 with the following objective: "*Sustainable development of the coastal zone of Cambodia including environmental protection and management of coastal resources for improved local livelihoods and national welfare".* The immediate objectives of the Danida project were:

    1. The NCSC functional and the CCU[91] of the MoE operational according to its mandate including Cambodia's national policies and commitment to the international agreement.

[90] The executive summary from Completion Report of Environmental Management within the coastal zone, Phase 3, is included in Appendix 16. Further information can be found in: Danida/MoE 2008. Environmental Management of the Coastal Zone, Cambodia – Phase 3, Completion Report and Lessons learned from the Natural Resource and Environment Programme, Danida supported NRE Programme 2001-2006, Royal Danish Embassy, Danida Development Cooperation Section, Cambodia, December 2006.

[91] Coastal Coordination Unit.

2. The provincial authorities monitor and assess coastal resources and support environmental protection and community-based coastal resource management.
3. Coastal communities implement participatory Local Area Coastal Resource Management taking into account building of social capital, enforcement of local user rights, involvement of women, and generation of improved livelihood to reduce poverty.

96. The project will make use of the detailed information collected and analysed through the Danida project when assessing climate change vulnerability and risk assessment within the coastal zone. Furthermore, the lessons learned from the Danida project regarding how to achieve cost-effectiveness of the capacity building activities, for example, will be applied to the project. Similarly, the project will draw on several important lessons learned through the Danida project regarding capacity development projects, namely: i) maintain focus throughout the whole capacity development effort; ii) establish local ownership; and iii) that capacity building is a long-term effort. The Danida project in Cambodia was implemented through three phases, which also included several bridging periods, resulting in somewhat changed focus during the implementation period. Another lesson learned through the Danida project is that because the capacity at the national-, provincial- and commune-levels in Cambodia is particularly weak, support provided by projects in Cambodia should not be too complex as this may go beyond local understanding and thereby lose local ownership of the project. Additionally, it is often difficult for counterpart staff to adapt to donor-induced changes without a loss in motivation or understanding. As capacity development is a long-term effort it is important that the counterpart staff involved have the basic education level relevant for their positions, are at an age where they will still be working within the fields strengthened through the capacity development efforts when these efforts are finalized, and that the involved institutions agree to a career plan for the involved staff.

97. This Danida project detailed in Section 2.7 and the other projects detailed in 2.8 that have recently operated within the coastal zone did not specifically incorporate climate change considerations and thus were not adaptation-focused. The project will pilot adaptation and promote climate change awareness within the coastal zone whilst building on these projects/programmes.

98. Without LDCF support, the development of the natural resources, water resources and agriculture sectors within the coastal zone of Cambodia is at risk of being ineffective as a result of climate change impacts. The projects finalised or currently implemented in these sectors along the coast are not designed to take climate change impacts and projected climate change risks into account and are thus their success is likely to be jeopardised by the projected long-term changes in the patterns and intensity of rainfall and extreme weather events, as well as SLR. By funding the additional costs of interventions necessary to meet the urgent and immediate adaptation needs identified in the NAPA, the project will contribute to safeguarding baseline development initiatives in the natural resources, water resources and agriculture sectors within the coastal zone against projected adverse climate impacts. The project will ensure that the risks of climate change, including variability, are integrated into key natural resources and agriculture management practices at the community and national levels and that the overall governance mechanisms guiding development processes within the coastal zone of Cambodia have sufficient capacity to integrate anticipatory adaptation planning into their extension and decision-making practices.

2.8. Linkages with other GEF and non-GEF interventions

99. The project is receiving parallel co-financing from the Cambodia Climate Change Alliance (CCCA) through the CCCA Coastal Component project[92], which will be funding complementary activities within the coastal zone (details contained with Appendix 20). The CCCA is the leading climate change facility in Cambodia and has a budget of US$ 8.5 million through the contribution of its four donor partners, namely the European Union (EU), SIDA, Danida and the UNDP. Of this amount, US$ 2.2 million has been committed to the CCCA Coastal Component and will form parallel co-financing for the project. As such, the project is well-aligned with the CCCA Coastal Component as well as the CCCA Support Programme (details contained within Appendix 20). CCCA parallel co-financing will be allocated predominantly to on-the-ground adaptation measures within the demonstration sites as well as to integrating climate change considerations into land use and coastal development plans and building the adaptive capacity of vulnerable communities. Activities funded by CCCA will thus contribute towards the realisation of the project's outcomes. The project will complement the CCCA-funded activities by *inter alia*: i) piloting additional small-scale adaptation measures within vulnerable communities; ii) developing capacity at the national and provincial level to manage climate risks in the coastal zone; iii) improving climate change science; iv) developing an adaptation plan for the coastal zone; v) incorporating climate change considerations into relevant policies; and vi) improving climate risk monitoring in the coastal zone.

100. The activities of the project will also be closely coordinated and linked to the following activities currently underway or which have recently been completed within the coastal zone:

- Cambodia is one of the countries involved in the World Bank-led **Pilot Programme for Climate Resilience** (PPCR) and is expected to receive a US$ 20 million grant for climate change adaptation. The PPCR is also providing an additional US$ 20 million in concessional loans although Cambodia has not made any commitment with regards to the loan. The PPCR will focus on climate-resilient investment, building on the NAPA and supporting the integration of climate change into national and sub-national development and sector plans. In Cambodia, PPCR is implemented through a partnership between World Bank (WB), ADB and UNDP. Currently, discussions are also being undertaken between PPCR and CCCA to join forces to more effectively improve Cambodia's resilience to climate change impacts. At the time of the drafting of this project document, the PPCR does not include specific activities within the coastal zone. However, discussions have already been undertaken with representatives of the PPCR, to identify potential collaboration on-the-ground if the project identified additional investment-orientated interventions within the coastal zone.

- The first NAPA implementation project is currently being implemented through the UNDP-GEF project '**Climate resilient water management and agricultural practices'**, which has a duration of three years and is being implemented in collaboration with IFAD. The project will undertake activities to ensure that projects and programmes aimed at capacity building of relevant government institutions in Cambodia take future climate change impacts into account. Part of the funding will be used to strengthen the adaptive capacity of key national and sub-national institutions (particularly provincial and district departments of agriculture, water resources and meteorology, Commune Councils, and FWUCs) as well as to ensure that they are able to efficiently design, monitor and manage climate-resilient water resource management and rural development projects. The project will develop expertise of district agricultural extension teams in the management of climate risks with respect to water management, and train Commune Councils in Battambang and Siem Reap, two target districts, in climate risk management

[92] The objective of the CCCA Coastal Component is: "increased resilience of coastal communities and ecosystems to climate change through adaptation planning, demonstrated targeted local interventions and provision of practical learning experience in adaptation planning to the NCCC/CCD".

approaches. In addition, key stakeholders at the community level in both districts will be involved and actively enabled to support community-based adaptation planning processes. The project will demonstrate climate-resilient rainwater harvesting techniques at both the household and village level. By diversifying the sources of water used for different purposes (agriculture, sanitation and consumption), overall access to water resources in changing climatic conditions will be improved, as will conditions for human health. While the UNDP-GEF project does not focus on coastal zones, links between the project and the UNDP-GEF project will be established and all efforts will be made to coordinate with this project to ensure effective implementation of the NAPA priorities, and to exchange technology and knowledge on climate change adaptation in the agriculture sector. In this way, the project will avoid duplicating activities and will establish synergies with this project. In order to establish links and exchange lessons, a communication mechanism between the project and the UNDP-GEF project will be established whereby practical and informal meetings will be held at least every six months between the two implementation teams to share progress on-the-ground, learn lessons and explore the possibilities of undertaking joint activities (e.g. awareness raising).

- Since July 2006, the **Natural Resource Management and Livelihoods Programme,** the joint programme between the RGC, Danida and DFID, has been implemented. The programme is in the final stage of the first phase, having been planned for five years for the period 2006-2010 with an overall budget of US$ 60 million. This programme focuses on investment in rural people of Cambodia (i.e. those particularly vulnerable to adverse weather conditions and natural disasters) who are under increasing pressure to sustain their livelihoods and access and use natural resources. The programme consists of the following four components:

    - Support to Natural Resource Management and Livelihoods within RGC D&D Programme with a planned budget US$ 20 million for investment.
    - Support to Civil Society and Pro-poor Markets with a planned budget of US$ 13 million.
    - Support to Natural Resource Sector and Policy Development with a planned budget of US$ 12 million.
    - An unallocated budget and Programme Management with a budget of US$ 14 million.

  The land use plans prepared during the first phase of the programme (since completed), in particular, provide important baseline information for the project. These plans will be taken into consideration when the project undertakes its vulnerability mapping activities. The second phase of the programme for the period 2011-2015, presently under preparation, plans to initiate similar activities in Kampot Province and coordination with its activities will certainly be valuable for the project. At the present state, however, there is no indication if the second phase will include any specific activities in relation to climate change. The project implementation team will work closely with the Natural Resources Management and Livelihoods Programme implementation team to avoid duplication of efforts, learn valuable lessons and encourage synergies.

- The **National integrated strategy of coastal zone and master plan of Sihanoukville Province for sustainable development** was supported by the Japanese International Cooperation Agency (JICA) and was implemented through the MLMUPC. Main outputs included:

    - National integrated strategy of coastal zone for sustainable development including the strategies of industrial development, infrastructure development, environmental management, and development for core cities in coastal zone.
    - Master plan of Sihanoukville Province including plans of land use and infrastructure development targeting year 2030.

- Capacity development plan including drafts of training programs, institutional improvement and organisational improvement.

The planning maps produced for Sihanoukville Province will be valuable for the project and the scenario development for SLR can be applied in zoning plans. For this reason, this master plan will be consulted during the vulnerability assessments undertaken in Sihanoukville Province by the project.

- The **Regional Fisheries Livelihood Programme for South and South-East Asia** is a regional project implemented by FAO in Cambodia, Indonesia, Philippines, Sri Lanka, Timor-Leste and Vietnam. The main outcome of the programme is: "*strengthened capacity among participating small-scale fishing communities and their supporting institutions towards improved livelihoods and sustainable fisheries resource management*". The programme's outputs include: i) co-management mechanisms for sustainable utilization of fishery resources; ii) measures to improve safety and reduce vulnerability for fisher communities; iii) measures for improved quality of fishery products and market chains; iv) diversified income opportunities for fisher families; v) facilitated access to microfinance services for fishers, processors and vendors; and vi) regional sharing of knowledge in support of livelihood development and reduced vulnerability for fisher communities, and of sustainable fisheries resource management. An approximate budget of US$ 2 million has been allocated for activities in Cambodia, working with FiA and the MAFF. An inception workshop has been recently held and activities will soon start with the identification of fishery baseline information. Discussions have been held with the FAO country and regional office and potential entry points for collaboration have been identified in the livelihood differentiation for fishermen families. In this aspect, the FAO programme is currently exploring possibilities regarding mangrove rehabilitation/conservation and carbon credit generation (REDD). Activities of this type will start during 2011. Initial discussions have already been undertaken between this programme's and the project's development team and these will be closely followed up and detailed in the future to ensure coordination of the activities. In the meantime, several of the results from the project (especially results of the in-depth vulnerability assessments) will also be of great value to the FAO programme. To build collaboration between the project and this programme will ensure that duplication of efforts is avoided. To achieve this, the project implementation team will continue to meet with the programme's implementation team during implementation to explore potential lessons sharing and synergies.

- The **Partnership in Environmental Management of the Seas of East Asia (PEMSEA)** originated in 1994 as the regional programme on Marine Pollution Prevention and Management for the East Asian Seas Region. Among various achievements, PEMSEA (in its original form) also led to the signing of the Putrajaya Declaration (or the Sustainable Development Strategy for the Seas of East Asia, SDS-SEA). During the East Asian Seas Congress in 2009, PEMSEA was transformed into an international body to work towards sustainable development of the region's coastal and marine areas. The transformed PEMSEA aims at building inter-agency, inter-sectoral, and inter-governmental partnerships for achieving the sustainable development of the Seas of East Asia. Its regional programme priorities include: i) the establishment of a functional regional mechanism for a sustainable development strategy (SDS) of the Seas of East Asia (SEA); ii) the development of national policies and reforms for sustainable coastal and ocean governance; iii) the strengthening of Integrated Coastal Management (ICM) scaling up for sustainable development; iv) the integration of biodiversity conservation and energy conservation into climate change mitigation plans and ICM programmes; and v) the development and implementation of financing and investment plans for pollution reduction. PEMSEA's main goals include: i) decentralizing PEMSEA Resource Facility activities through partnership and networking arrangements between member countries; ii) enhancing corporation and social

responsibility through ICM; iii) disseminating and conducting ICM model training courses; iv) developing the initial ICM postgraduate degree courses; v) expanding the ICM learning centre; and vi) increasing PEMSEA regional centres of excellence. One of PEMSEA's six demonstration sites for ICM (across the member countries) is located in Sihanoukville Province. This province was chosen as a demonstration site due to: i) its potential vulnerability; ii) it being one of the most important coastal tourist destinations in the country; iii) its relevant infrastructure; and iv) it being the site of the future airport. The main work in this province was concluded in 2008, with the preparation of the "Coastal Strategy for Sihanoukville", which includes information regarding coastal use zoning and is presently used in the province as a tool for operations within the coastal zone of the province. In addition, during the past two years discussions have been undertaken for a potential coastal zoning project for the Occheuteal beach (Sihanoukville Province). Furthermore, PEMSEA has produced a State of the Coasts report for Sihanoukville Province, which is presently in the publication process. At present, the following activities are ongoing or planned for Sihanoukville Province as part of the PEMSEA overall programme: i) training of staff regarding environmental management of the coast (including trips to other member countries to facilitate knowledge sharing and south-south cooperation); ii) raising awareness among the public (including school children); and iii) undertaking wastewater management and sanitation activities. Mangrove rehabilitation has also been undertaken and is planned for the future. The project will use the information generated by PEMSEA (particularly the Coastal Strategy and State of the Coasts Report) when undertaking activities for the achievement of Outcome 2 to avoid duplication of efforts. The Cambodian National Coordinator for PEMSEA expressed his support for the project and efforts will be made to liaise with the coordinator during the implementation of project activities in Sihahoukville Province so as to share lessons and create synergies.

- The **Participatory Irrigation Management and Development** (PIMD) programme is implemented by MoWRAM and is seeking to devolve responsibility for all aspects of scheme operations to the FWUCs, which constitute the focal institutional mechanism of PIMD. The PIMD has provided the overall framework for the formation of FWUCs and irrigation management transfer (IMT) to the FWUCs. Since the adoption of PIMD, 328 FWUCs have been established of which 114 have been officially recognized by MoWRAM. Prakas (declaration) 306 accepts the FWUC as essential in irrigation development and management and provides the required Statute for the formation of FWUCs. The communities in Prey Nup have established a FWUC and the experience from their activities will be used in the planning of the adaptation measures in this area. Additionally, the FWUC in Prey Nup will be used as the management committee responsible for adaptation measures.

- **Regional Climate Change Adaptation Knowledge Platform for Asia and Asia Pacific Adaptation Network**[93] (hereafter referred to as the Adaptation Knowledge Platform) has been developed in response to the demand for effective information sharing mechanisms regarding climate change adaptation and to improve adaptive capacity development in South and South-East Asian countries. In so doing, the Adaptation Knowledge Platform supports research and capacity building, policy-making and information sharing and thereby facilitates climate change adaptation at local, national and regional levels to strengthen adaptive capacity of countries in the region – while working with existing and emerging networks and initiatives. The Adaptation Knowledge Platform was developed using funds received from SIDA and initial partners are the Asian Institute of Technology (AIT)/UNEP Regional Resource Centre for Asia and the Pacific (RRC-AP), the Stockholm Environment Institute (SEI), the Swedish Environmental Secretariat for Asia (SENSA) and UNEP. The Adaptation Knowledge Platform ran its scoping mission in

[93] For additional information, see www.climateadapt.asia.

Cambodia in late 2009, sharing information with the CCD and UNDP, among other stakeholders. A "Scoping study on climate change adaptation in Cambodia" was thereafter prepared in collaboration with the Community-Based Natural Resource Management Learning Institute through consultations and workshops with relevant stakeholders. Importantly, the Adaptation Knowledge Platform also recognizes the importance of potential collaboration with the project, particularly in terms of: i) supporting the management of the knowledge to be generated through the project; ii) bringing the lessons that will be learned through the implementation of the project's adaptation measures up to the regional level; and iii) supporting the capacity building/enhancement process of national staff and stakeholders involved in the project through facilitating their participation in learning events on climate change adaptation. The Adaptation Knowledge Platform would also support the sharing of the results and lessons learned from the project through the Climate Change Adaptation in Asia and the Pacific portal (regional and national level entity). At the same time, the Adaptation Knowledge Platform will represent an international door for the project through its collaboration with the Asia Pacific Adaptation network (initial partners include UNEP, Institute for Global Environmental Strategies, IGES, and ADB). Through this important collaboration, the project will ensure that knowledge is shared with other development countries. As such, the project will compile and document lessons learned through the implementation of its activities and disseminate them in the appropriate format to the Adaptation Knowledge Platform. Lessons learned through the implementation of project activities will be further disseminated to a wider audience via the Knowledge Platform developed as part of Result 2 of the CCCA Support Programme. As a result, the project will disseminate its lessons through two knowledge management platforms (namely the platform developed through Result 2 of the CCCA Support Programme and the Adaptation Knowledge Platform).

- The **UN-REDD Programme** currently supports REDD+ readiness activities in nine pilot countries, spanning Africa, Asia and the Pacific and Latin America and has approved a total of US$ 42.6 million for eight of the programme's nine initial pilot countries. These funds help to support the development and implementation of national REDD+ strategies. National programmes in four UN-REDD pilot countries (Democratic Republic of Congo, Indonesia, Tanzania and Vietnam) are now in their implementation phase. While current funding is programmed for its nine pilot countries, the programme has also welcomed 13 others to be observers to its Policy Board, and has given them access to other benefits of the programme, such as networking, participation in regional workshops and knowledge sharing, facilitated by the programme's interactive online workspace. Cambodia is one of these countries and if later substantive activities will be initiated in Cambodia, the proposed mangrove replanting to be undertaken by the project will be coordinated with this programme.

101. At the outset of the project, a project managers' coordination working group will be established comprising managers from the abovementioned projects/programmes in order to coordinate efforts and avoid overlap. Such a working group will meet on an annual basis during project implementation.

SECTION 3: INTERVENTION STRATEGY (ALTERNATIVE)

3.1. Project rationale, policy conformity and expected global environmental benefits

Project rationale

102. The project will respond to the climate change impacts and climate variability adversely affecting the Cambodian coastal zone as well as implement measures to withstand future anticipated climate change impacts and will do so by following three mutually supportive components, namely: i) policy;

ii) research (adaptation planning and risk assessments); and iii) demonstration of adaptation at the community level (see paragraph 105). Specific activities to be undertaken by the project within these components include: i) building adaptive capacity at the national, provincial and local levels to facilitate effective adaptation within the coastal zone; ii) integrating climate change considerations related to the coastal zone into national policy and coastal development plans; iii) strengthening climate change science related to the coastal zone; iv) improving local awareness related to climate change risks and adaptation within the coastal zone; v) developing an adaptation plan for the coastal zone through capacity building exercises involving all relevant national, provincial[94] and local stakeholders; vi) piloting small-scale adaptation measures to demonstrate successful adaptation at the local level; and vii) introducing alternative livelihoods to reduce the pressure placed on natural ecosystems and to improve income streams despite climate change conditions. The project will be adopting Ecosystem-Based Adaptation (EBA) methods (such as mangrove restoration), widely accepted as a key innovative approach to adaptation. EBA is based on sustainable ecosystem management principles for building resilience in vulnerable and degraded ecosystems using well-managed and healthy ecosystems as "natural infrastructure" for climate change adaptation and disaster risk reduction. EBA is site-specific but supports societal adaptation actions at multiple scales ranging from, for example, a small catchment to a large river basin. Following EBA approaches for the project will not only be valuable in terms of climate change adaptation, but also in terms of livelihood enhancement and climate change mitigation through improved ecosystem services and carbon sequestration[95]. This may provide opportunities for collaboration with REDD activities/projects, currently of relevance for Cambodia, which recently entered as an observer to the UN-REDD project.

103. Through the achievement of the above activities, the project will alleviate critical barriers preventing effective adaptation and exacerbating vulnerability to climate change at the community level (see Barriers section, Section 2.2). Additionally, this project will be the second initiative to implement NAPA (2006) priorities in Cambodia[96] and is thus responding to the urgent needs of the population.

Policy conformity

104. The project is well aligned with the country's main development policy, the updated NSDP (2009 – 2013, see paragraph 68). In addition, and as outlined in the Policy Framework section (within Section 2.5), the project will contribute to the achievement of the objectives of a number of important Cambodian policies, including:

- The **NPRS (2002)** by contributing to the following of the strategies' priority poverty reduction actions within the coastal zone[97]: i) improving rural livelihoods; ii) improving capabilities; iii) strengthening institutions and improving governance; iv) reducing vulnerability and strengthening social inclusion; and v) promoting gender equality.
- The **Agricultural Sector Strategic Development Plan (2006 – 2010)** (see paragraph 74);
- The **NP-SNDD** (see paragraph 69);

[94] Provincial stakeholders to be engaged with during the project will include those from the four coastal provinces, Kep, Sihanoukville, Kampot and Koh Kong.
[95] Ecosystem-based adaptation: An approach for building resilience and reducing risk for local communities and ecosystems. 2008. A submission by IUCN to the Chair of the AWG-LCA with respect to the Shared Visions and Enhanced Action on Adaptation. Available from: http://unfccc.int/resource/docs/2008/smsn/igo/029.pdf
[96] The first initiative implementing NAPA priorities is detailed in Section 2.8.
[97] These actions are elaborated upon in the NPRS (2002).

- The **NWRP** (2004) by: i) strengthening the FWUCs in Prey Nup through training and employing them as management committees overseeing adaptation measures; ii) introducing and raising awareness regarding climate-resilient irrigation techniques; iii) improving access to safe water for drinking and irrigation purposes through the distribution of water storage technologies in the demonstration sites; and iv) strengthening existing flood management structures (i.e. dykes).

LDCF conformity

105. The LDCF was created with the objective of funding urgent and immediate adaptation needs in the Least Developed Countries as identified in their NAPAs. The project conforms to the LDCF's eligibility criteria, namely: i) undertaking a country driven and participatory approach; ii) implementing the NAPA priorities; iii) supporting a "learning by doing" approach; iv) undertaking a multi-disciplinary approach; v) promoting gender equality; and vi) undertaking a complementary approach, as described below.

- **Country drivenness and undertaking a participatory approach:** Activities to be undertaken by the project were selected through numerous stakeholder consultations (see Section 2.3) and thus are in line with country priorities. See Section 3.6 for information on country drivenness.
- **Implement NAPA priorities:** the project will implement the following high priority adaptation projects identified during the Cambodian NAPA process: 3G ("rehabilitation of coastal protection infrastructure") and 4B ("community mangrove restoration and sustainable use of natural resources"). Additionally, the project will contribute to the achievement of project 2 ("assessment of needs for setbacks, vegetation buffers and protection structures in coastal zones"), a low priority adaptation project identified through the NAPA process.
- **Supporting a "learning by doing" approach:** the project will support a "learning by doing" approach by building capacity at national and provincial levels, which will allow for the identification of additional vulnerable areas and relevant adaptation measures, which can be replicated in other coastal areas of Cambodia. Additionally, the successful adaptation measures piloted by the project will be used to inform national and sub-national development plans and policies. Furthermore, the project is designed to complement other ongoing and planned projects and programmes without duplicating them.
- **Multi-disciplinary approach:** as mentioned above, the project includes three mutually supportive components, namely: i) providing policy advice at the national level to strengthen adaptive capacity; ii) strengthening climate change-related science in Cambodia (thereby improving scientific tools for effective adaptation planning); and iii) demonstrating effective on-the-ground adaptation at the local scale. Within each component, the project will undertake a number of activities (see Section 3.3) to facilitate adaptation within the coastal zone.
- **Gender equality:** project outcomes will contribute to an understanding of how adaptation responses can be designed to strengthen gender equality. Efforts to promote gender equality will also be integrated in all aspects of the project's activities and management. This will be achieved through the development and use of gender-disaggregated indicators where relevant (see the Project Results Framework, Appendix 4), as well as through the conscious integration of women in community-based activities, including training, and in the introduction of alternative livelihoods. See Section 3.11 for more information.
- **Complementary approach:** In order to build upon existing plans and avoid the duplication of efforts, the project will work in conjunction with relevant ongoing projects in Cambodia (see Section 2.8).

Overall GEF conformity

106. The project has been designed to meet overall GEF requirements in terms of implementation and design. For example, the following requirements have been attained:

- **Sustainability:** Training and capacity building of staff within national and provincial institutions as well as of community members are priorities of the project and will ensure that adaptive capacity is strengthened at all levels. In so doing, adaptation measures are likely to be sustainable beyond the project lifetime. See section on Sustainability (paragraphs 167 -169) for more information.
- **Replicability:** The documentation of studies, analyses and best practices will allow for the development of a more robust planning framework through participation of all relevant partners. In addition, plans for upscaling key project activities, such as mangrove rehabilitation will also be developed during the course of the project. Furthermore, by disseminating lessons learned through two knowledge platforms (namely the Adaptation Knowledge Platform and the CCCA Knowledge Platform, see Section 2.8) future adaptation endeavours within the coastal zone are more likely to be successful. See section on Replicability (paragraphs 170 - 172) for more information.
- **Monitoring and evaluation (M&E):** The project design includes an effective M&E framework, which will enable ongoing adaptive management, ensuring that lessons are learned and disseminated by producing regular progress reports for stakeholders. See Section 6 on M&E for more information.
- **Stakeholder involvement:** The project design was formulated as a result of extensive stakeholder consultations (see Section 2.3) and will ensure the involvement of stakeholders during project implementation and monitoring.

3.2. Project goal and objective

107. The **objective** of the project is: "*to reduce the vulnerability of coastal communities to the impacts of climate change by strengthening policy and science, and demonstrating targeted local interventions to increase ecosystem resilience*". The overall **goal** of the project is: "*to reduce coastal vulnerability to climate change impacts on agricultural systems and natural ecosystems within the coastal zone*."

3.3. Project components and expected outputs

108. The project is well aligned with the CCCA Coastal Component Programme from which it is receiving parallel co-financing for adaptation measures (see Appendix 20 for additional details).

Outcome 1: Institutional capacity to assess climate change risks and integrate them into national development policies strengthened.

Adaptation Alternative

109. To improve inter-sectoral coordination and institutional capacity related to: i) the assessment of climate change risks within the coastal zone within Cambodia; ii) the integration of climate change risks into appropriate policy; iii) the identification of appropriate adaptation measures; and iv) the development of a participatory local-level adaptation plan for the coastal zone (to be undertaken within Outcome 2), the project will establish a data network across relevant ministries/departments. This data network will facilitate the collection and analyses of data (the results of which will be disseminated to the CCU) and will involve connecting technical experts from appropriate ministries in person, and via the internet, to collaborate on specific tasks. Such analyses will enable future

climate change risks within the coastal zone to be assessed. Additionally, the data network will strengthen inter-ministerial coordination and capacity within participating ministries to develop effective adaptation measures to be earmarked for future funding sources. Inter-sectoral coordination will be further strengthened by the project providing advice related to the incorporation of climate change considerations into policy where necessary. All socio-economic and bio-physical data collection undertaken through the project's activities as well as all climate modelling and coastal vulnerability assessments/mapping conducted will also be distributed through the data network to inform the abovementioned analyses. Additionally, such information will be used to assess the suitability and cost-effectiveness of the identified adaptation measures to be implemented by the project.

110. To further ensure the effectiveness of the data network and understanding of the results generated, the project will i) undertake capacity building related to climate change risks, analyses and adaptation; and ii) strengthen coordination between relevant ministries and institutions to facilitate effective management of climate change impacts and future climate change-related risks within the coastal zone. This will be achieved through targeted capacity building based on assessments of training needs and existing capacities. In so doing, the project will: i) improve and strengthen institutional capacity to design and implement climate change adaptation measures within the coastal zone; and ii) ensure that climate change considerations will be incorporated into national-level development plans pertaining to the coastal zone. In addition, climate change risks within the coastal zone will be assessed by conducting climate risk assessments for the coastal zone by undertaking climate risk modelling exercises, the results of which will be fed into the vulnerability mapping exercises to be part of Outcome 2. Importantly, the project will utilise data already collected and analyses already undertaken as part of the development of the SNC[98] when computing climate scenario models. Overall, the activities undertaken within this outcome will result in institutional and human capacity being strengthened and built within relevant national-level institutions in order to effectively manage climate change risks within the coastal zone.

111. Furthermore, the project will facilitate the development of indicators to monitor climate change impacts on the coastal zone. This will allow for monitoring of climate change impacts after the project's lifetime and thus assist in future development- and adaptation-related planning within the coastal zone. Technical staff in relevant ministries will be capacitated to collect relevant data as well as measure and monitor the identified indicators. These indicators will be included in the forthcoming 3rd State of the Coastal Environment Report (to be produced by the MoE) and will therefore be widely disseminated.

112. CCCA funds have been be allocated towards complementary activities to those funded by the LDCF. For example, CCCA will build institutional capacity related to implementing adaptation measures in the coastal zone at the national level by disseminating the lessons learned through the implementation of the adaptation measures to key stakeholders[99] by means of workshops and meetings. Additionally, CCCA funds will be allocated towards assessing priority adaptation options. As such, CCCA will contribute US$ 315,000 to Outcome 1.

Output 1.1: Systems and processes for identification and implementation of adaptation measures.

[98] The SNC is due to be finalised and published toward the end of 2010 and the Director of CCD and representative of the SNC agreed on sharing all the findings with the project implementation team during the Local Project Appraisal Committee meeting held for the CCCA Coastal Component held on 26 July 2010 in Phnom Penh.

[99] E.g. relevant ministries (such as MoE MOWRAM, MRD, MAFF, MIME and MLMUPC), institutions and departments (e.g. CCD and CCU).

Activities:

1.1.1. Undertake gap analyses and institutional mapping exercises in relevant government agencies to determine shortfalls in planning and implementation of adaptation measures.
1.1.2. Establish a data network based on the results of Activity 1.1.1 to supply climate-related information to existing government development processes.
1.1.3. Conduct a capacity needs assessment for climate change adaptation training for relevant agencies[100] at the national level and prepare training courses based on the needs assessment for national-level staff.
1.1.4. Implement training courses (including at least one national-level training workshop) based on the results of Activity 1.1.3.
1.1.5. Identify appropriate climate models for assessing climate change risks in the Cambodian coastal zone based on the data available, the data generated through the vulnerability mapping exercises undertaken as part of Output 2.1 and the country circumstances.
1.1.6. Assess climate change risks on the Cambodian coastal zone by undertaking regional climate change scenarios[101] and impacts scenarios as well as downscaling for the water sector[102].

Output 1.2: Climate change risks are incorporated into development plans and policy.

113. Responsibility for developing national policy documents falls under the CCD. The project will thus support the CCD in the process of policy review and modification in relation to coastal climate change impacts and risks. In order to facilitate the incorporation of climate change considerations into relevant policy, one of the project's activities will include a study trip to a relevant country with experience in dynamic systems modeling. This will enable relevant ministry officials to learn from the dynamic systems modeling approach. Dynamic systems modeling is an appropriate tool for integrating climate change considerations into relevant policy. Appendix 17 contains more information related to dynamic systems modeling.

Activities:

1.2.1. Undertake a gap analysis of national development plans and policy[103] to determine the extent to which climate change risks are included.
1.2.2. Prepare a summary report and policy briefs detailing the results of climate risk assessment and distribute to key stakeholders (including NCCC, CCU) and policy-makers.
1.2.3. Undertake a study trip to a relevant country with experience in dynamic systems modelling (e.g. Threshold 21[104]) for decision- and policy-makers and members of the CCD to demonstrate the effectiveness of dynamic systems modelling for developing policies to adapt to climate change.
1.2.4. Draft proposals for amending national plans / policies including for altering respective budgets.
1.2.5. Revise relevant national policies to incorporate climate change risks.

[100] Including representatives from key line ministries, committees and departments at a national level, including, but not limited to the: MAFF, MIME, MLMUPC, MoE, MoH, MPWT, MRD, MoWRAM, National Committee for Disaster Management (NCDM), Ministry of Women's Affairs (MoWA), Fisheries Administration, Department of Coastal Zones and Wetlands, CCU, General Department of Administration for Nature Conservation and Protection and CCD.
[101] E.g. PRECIS.
[102] E.g. Water Evaluation and Planning (WEAP) for water.
[103] Including, but not limited to the NPRS, the NSDP, the Agricultural Development Plan, the NWRP and the National Biodiversity Strategy and Action Plan.
[104] Threshold 21 modelling (T21) is an example of a dynamic systems modelling tool designed by the Millennium Institute to guide long-term policy formulation. See Appendix 17 for more details regarding dynamic systems modelling.

Output 1.3: Relevant government departments are trained on climate change risks within the coastal zone.

Activities:

1.3.1. Undertake training exercises with members from CCD, MoE and other key stakeholders[105] regarding: i) the results of the climate scenario modelling undertaken as Activity 1.1.6; and ii) the lessons learned through the implementation of adaptation measures (see Outcomes 3 and 4).

Output 1.4: Indicators for monitoring climate change impacts and assessing risks in the coastal zone in place.

114. It is important to identify and apply climate change indicators for the coastal zone in order to effectively assess trends in climate change impacts. Existing and available data will be assessed and potential indicators and gaps identified. The indicators identified will be utilised in the 3rd State of the Coastal Environment Report to be produced by the MoE. Importantly, all indicators developed by the project will be primarily based on existing data collection practices within government in order to ensure sustainability of data collection and monitoring.

Activities and sub-activities:

1.4.1. Develop climate change indicators (e.g. related to bio-physical data) for the coastal zone based on i) existing data; ii) existing data collection practices; iii) the results of Activity 1.1.6; and iv) data generated by the data network. Importantly, these indicators will incorporate gender considerations.

1.4.1.1. Document climate change indicators in a report for those responsible for developing the 3rd State of the Coastal Environment Report.

1.4.2. Train technical staff in appropriate ministries to measure the indicators on-the-ground, analyse the indicators and present them in the appropriate format to decision- and policy-makers. (This data will then be sent to the data network and the CCU to adjust the participatory local-level adaptation plan developing in activity 2.2.4).

1.4.3. Conduct workshops with key stakeholders (including those responsible for developing the 3rd State of the Coastal Environment Report) to develop and raise awareness regarding the climate change indicators developed.

1.4.4. Develop a long-term monitoring plan to assess climate change trends (e.g. SLR, rainfall, tropical cyclones, flooding activity, incidence of droughts) over the coming decades.

1.4.5. Capture lessons learned through implementation of Outcome 1's activities in a lessons learned report and distribute it to both the CCCA-funded knowledge management platform and the Adaptation Knowledge Platform (in close cooperation with CCCA).

Outcome 2: Adaptation planning in the coastal zone improved.

[105] Including representatives from key line ministries, committees and departments (importantly including stakeholders from all four coastal provinces), including, but not limited to: the MAFF, MIME, MLMUPC, MoE, MoH, MPWT, MRD, MoWRAM, National Committee for Disaster Management (NCDM), Ministry of Women's Affairs (MoWA), Fisheries Administration, Department of Coastal Zones and Wetlands, Coastal CCU, General Department of Administration for Nature Conservation and Protection and CCD.

Adaptation alternative

115. Vulnerability and risk assessments for the coastal zone will be undertaken as part of Outcome 1's activities and the results of such assessments will facilitate the development of coastal vulnerability maps, which will aid in future planning and development within the coastal zone. Furthermore, the vulnerability maps will identify areas or communities within the coastal zone which are particularly vulnerable to projected climate change risks. Such maps can be used to earmark areas or communities to be priority recipients of future adaptation funding/efforts. The mapping exercises undertaken by the project will build upon existing vulnerability studies, such as the Sihanoukville Coastal Strategy as well as the work undertaken by the Natural Resource Management and Livelihoods Programme, MLMUPC, Danida and JICA (see Sections 2.7, 2.8 as well as Appendices 16 and 19). These maps will be tailored to assist in the preparatory work by national and local government for climate change adaptation. For example, a system has been established between national government and the FWUCs to ensure effective operation and maintenance of structures protecting agricultural fields (e.g. dykes) within the coastal zone. Based on the maps developed, a relationship will be established between the national authorities and FWUCs for identifying necessary works to be conducted to maintain dykes and other protective measures in order to reduce the risks associated with predicted climate change impacts, as well as to identify the necessary budget for the appropriate work to be carried out.

116. The project will facilitate the development of a participatory local-level adaptation plan, which will also include guidance related to climate-resilient land use planning and zoning. This plan will be developed with assistance from national, provincial and district institutions who receive capacity building as a result of the project (Outcomes 1 and 2). In so doing, national ownership of the plan will be created, which will ensure its implementation. By identifying priority vulnerable areas or communities and by developing a participatory local-level adaptation plan, the project will be contributing to improving the resilience of coastal ecosystems and reducing the vulnerability of coastal communities after the project's lifetime and into the future.

117. Capacity building will be undertaken with relevant stakeholders regarding appropriate zoning and land use planning and the need for considering climate change within such plans. Additionally, emphasis will be placed on strengthening the coordination roles of relevant bodies within the coastal zone by establishing clear lines of responsibility for planning, management and enforcement within the coastal zone.

118. This outcome will also facilitate the formulation of a consultative forum that will integrate private sector actors who have a stake in the coastal area into the development process, in order to increase their awareness of climate risks and provide them with the tools to undertake better planning and to engage their active participation in vulnerability reduction. These initiatives will also be linked to the development of eco-tourism in the mangrove region.

119. CCCA funds will be allocated to complementary activities to be undertaken at the provincial- and local-level. To improve the resilience of coastal ecosystems and reduce the vulnerability of coastal communities to climate change, for example, CCCA funds will be allocated towards developing a climate-proof coastal land use plan, which will, once implemented, enable communities to withstand the anticipated increased frequency of climate-induced coastal inundations and storm surges through the provision of setback lines and inclusion of appropriate zoning. As such, future endeavors within the coastal zone will be climate-proofed in order to preserve and protect natural coastal buffer systems and reduce the vulnerability of coastal communities to future climate change risks. Land use planning and zoning are critical components of effective adaptation planning for coastal areas in that planning and/or zoning that takes into consideration present climate change impacts and projected climate change risks will effectively climate-proof coastal development and reduce the impacts that

tropical cyclones, SLR, storm surges and flooding, for example, will have on coastal infrastructure. Importantly, planning should be centred both on a scientific evidence base related to predicted climate change risks as well as on consultations held with coastal communities in order to develop community buy-in.

120. The developed scenarios for climate change impacts within the coastal zone (funded by LDCF through Outcome 1) will also be integrated into land use/coastal development plans and will thus play a significant role in limiting the uncontrolled development which presently occurs within the coastal zone. Additionally, CCCA funds will go towards ensuring climate-resilient planning is undertaken in the coastal zone by encouraging the incorporation of climate change considerations into Commune Development plans and by promoting effective coordination between coastal Commune Councils and national and provincial institutions to support adaptation in the coastal zone. CCCA funds will also be allocated towards advising provincial governors and the executive committees (EXCOMs) on matters related to the implementation of adaptation measures. Activities to provide technical advice to rural infrastructure projects regarding climate-proofing their investments will also be funded by CCCA. The results of the assessments undertaken by the project will provide guidance regarding what type of infrastructure is required and where it is suitable. The results of the analyses can then be used to mobilize funds for the appropriate infrastructure. Hence, technical services provided through this activity will include writing of proposals for accessing specific funding sources. Overall, CCCA will contribute US$ 459,600 to achieving Outcome 2.

Output 2.1: Vulnerability maps for sensitive ecosystems and infrastructure within the coastal zone.

121. The vulnerability maps produced through this output will also be based on the risk assessments undertaken through Output 1.1. Importantly, the project will utilise data already collected and analyses already undertaken as part of the development of the SNC when developing the vulnerability maps for coastal communities and ecosystems.

2.1.1. Undertake detailed topographic analysis of the coastal zone to model the effect of SLR on coastal zones (e.g. map the inundation of the land based on increments of SLR of 50 cm, also taking into account the Bruun Rule[106]).
2.1.2. Undertake baseline characterization and shoreline investigation of the coastal zone and identify vulnerable communities, infrastructure and ecosystems along the coast based on the results of Activity 2.1.1.
2.1.3. Assess options for early warning systems within the coastal zone and present them to decision- and policy-makers in appropriate ministries.
2.1.4. Prepare detailed coastal vulnerability maps based on the assessments undertaken.
2.1.5. Develop a vulnerability report for distribution to stakeholders including the vulnerability maps and the indicators developed in Output 1.4.

Output 2.2: Relevant provincial- and district-level stakeholders are trained on climate-proofing development and adaptation planning within the coastal zone.

Activities:

2.2.1. Undertake a training needs assessment for provincial- and district-level departmental staff[107].

[106] The Bruun Rule describes the cross-shore response of a beach to sea level rise. According to this rule, one unit of SLR produces 50-100 units of water movement landwards thereby accelerating inundation and beach erosion. See http://www.cmar.csiro.au/sealevel/sl_drives_short.html (accessed 24 June 2010).

2.2.2. Engage private sector partners in coastal rehabilitation through the creation of a consultative forum and training on coastal vulnerability and risk management.

2.2.3. Conduct training and capacity-building workshops related to appropriate zoning and land use planning based on the analyses undertaken as part of Output 2.1 for provincial- and district-level departmental staff and private sector.

2.2.3.1. Establish clear lines of responsibility for planning, management and enforcement in the coastal zone during training/workshops.

2.2.4. Develop a participatory local-level adaptation plan (provincial-, commune- and district-level) for the coastal zone (including guidance on zoning and land use planning) in collaboration with the district- and provincial-level authorities and the capacitated CCD, MoE and other key departments.

2.2.5. Capture lessons learned through implementation of Outcome 2's activities in a lessons learned report and distribute it to both the CCCA-funded knowledge management platform and the Adaptation Knowledge Platform.

Outcome 3: Vulnerability of productive systems to increased floods reduced.

Adaptation alternative

122. The project will reduce the vulnerability of communities within the demonstration sites by rehabilitating and improving protective structures (e.g. dykes) to prevent the climate change-induced increase in tropical cyclones, SLR, storm surges and flooding from adversely impacting agricultural production (see Appendix 18 for details regarding LDCF-funded adaptation measures). Presently, existing protective structures are not high enough to adequately prevent flooding, particularly as the height of structures was not determined whilst taking into account climate change impacts and future climate change risks. The project will also improve access to water for domestic and agricultural purposes in areas where water reserves are threatened by SLR and subsequent saline intrusion. This, too, will contribute to protecting agricultural productivity from adverse climate change impacts, such as an increase in evapotranspiration rates and associated reduced soil water availability for crops. Additionally, rural livelihoods in such areas will be improved through the provision of water for drinking, washing and cooking purposes. Rainwater harvesting units will be introduced in order to capitalise on increased rainfall as a result of climate change and to reduce dependency on drinking wells, which are subjected to saline intrusion (see paragraph 28).

123. The project, in close cooperation with CCCA, will also assess and pilot alternative livelihoods deemed to be suitable in order to improve income streams in vulnerable communities despite climate change impacts and/or to offset potential losses in income generated by agriculture as a result of climate change.

124. The introduction of alternative livelihoods will follow assessments of the economic viability and practical feasibility of available livelihood options (e.g. introducing and piloting micro-enterprises, such as hair salons and engine repair workshops; introducing integrated farming principles; and providing micro-loans), which will be undertaken using CCCA funds. Additionally, options will be identified following intensive consultation with community leaders and members. The available alternative livelihoods listed are examples and those selected and piloted in the demonstration sites are not limited to these.

[107] For example, counterpart staff from *inter alia* the Environment, Fisheries, Forestry, Agriculture, Planning, Water Resources and Land Management provincial departments will be involved in the capacity building efforts.

125. On-the-ground adaptation measures to be implemented by the project will be tested at the demonstration sites to identify the activities that can be upscaled to other sites and provinces within the coastal zone, based on their demonstrated cost-effectiveness. Furthermore, the adaptation measures will aim to build local capacity to ensure that the activities are sustainable beyond the project lifespan.

126. The approach taken to identify the adaptation measures that can be upscaled to other areas of the Cambodian coastal zone using either CCCA funds or adaptation funding identified in the future is as follows:

- Undertaking "economic experiments" i.e. implementing the priority adaptation measures identified during the PPG phase following evidence-based protocols.
- Assessing the economic viability and practical feasibility of adaptation measures (i.e. through undertaking cost-benefit analyses) to identify successful adaptation measures and using this information to revise policy.
- Determining barriers to the upscaling of adaptation measures and using this information to also catalyse policy revision. Potential financial incentives for adaptation measures will also be identified and provided should the activity fail.
- Training Commune Councils and FWUCs, where appropriate, as management committees (using CCCA funds) in order to equip them with the ability to train neighbouring communities in the adoption of financially viable adaptation measures. Training Commune Councils and FWUCs (which both consist of community leaders) to oversee implementation, operation and maintenance of successful adaptation measures will also ensure ownership and longevity of the adaptation measures at the local level.

The measures identified as being suitable for upscaling will be highlighted in the project's lesson learned, which will be distributed via two knowledge management platforms (see Section 2.8).

127. By selecting activities that are scientifically sound, cost-effective, without significant barriers and supported by both strengthened adaptive capacity at both the local and national levels and an enabling policy environment, the likelihood of successful adaptation across the coastal zone will be high. Specific adaptation measures to be implemented by the project are included in Table 2 below, and further information related to their selection and the demonstration sites is included in Appendix 18.

Table 2. Adaptation measures to be implemented by the project using LDCF funds through activities within Outcome 3.

Intervention	Site	Details	Number of households benefiting
Prey Nup District, Sihanoukville Province			
1. Rebuild/rehabilitate sections of the dyke.	Ouk Gha Heng and Toul Tokoeng	The dyke needs to be rebuilt and raised by approximately 0.5 m to protect agricultural fields from increased SLR, flooding and storm surges as a result of climate change. This will cost $17,500 per km over 9 km, i.e. a total of $157,500.	Will positively impact 1200 households.
2. Plant Teap Tus trees to stabilise dyke soils.	Prey Nup, Ouk Yha Heng and Toul Tokoeng	This will prevent the dykes situated near mangrove forests from sinking into the soft mud and thus protect agricultural fields from increased flooding as result of climate change. 15 ha of dyke will be stabilized at $812/ha, i.e. total of $12,180.	

3. Improve access to safe drinking water.	Prey Nup	Provide 20 rainwater harvesting tanks to improve access to water at $750 a tank, i.e. a total of $15,000.	170 households
Koh Kong/Pream Krasaop District, Koh Kong Province			
4. Deepen a natural lake within the Toul Ki Kroum Village.	Toul Ki Kroum Village	Deepen the natural lake (to have a capacity of 50,625 m^3) to allow it to hold more water, which can be utilised by the Toul Ki Kroum Village for drinking and agricultural purposes. This will cost $2/$m^3$, i.e. a total of $101,250.	120

128. Additional adaptation activities will be identified, assessed and piloted using CCCA funds in collaboration with local communities to improve agricultural production despite climate change impacts and predicted risks. Overall, the majority of CCCA funds will be allocated towards implementing on-the-ground adaptation measures (i.e. across both Outcomes 3 and 4). In conjunction with such activities, community members will be trained on agricultural adaptation options through their involvement in adaptation measures as well as through the dissemination of training materials. As a result, community members in particularly vulnerable areas will be equipped with the knowledge and experience to effectively adapt to climate change impacts. Ownership of adaptation measures will be further developed through the use of Commune Councils and FWUCs as management committees to oversee the operation, maintenance and implementation of adaptation measures. As such, adaptive capacity and climate change-related knowledge will be built at the local level.

129. The project, in close cooperation with CCCA, will partner with other initiatives as mentioned in Section 2.8 in building the capacity of the FWUCs to undertake the operation and maintenance of the project's adaptation measures within the Prey Nup demonstration sites. FWUCs are active and effective in the Prey Nup polder, largely as a result of the extensive capacity building they received from ADB. Commune Councils (or groups from within the councils) will be tasked with managing adaptation measures in the Peam Krasaop/Koh Kong demonstration sites[108]. This also applies to Outcome 4's adaptation measures.

130. CCCA funds will also be allocated towards undertaking assessments on the current coping strategies employed within vulnerable communities, reviewing the vulnerability of existing agricultural practices to climate change risks, developing guidance materials related to climate-resilient irrigation infrastructure as well as analysing the financial benefits associated with modified agricultural practices. CCCA-funded activities will also include providing support to NGOs and farmers regarding the application of modified agricultural practices and improving community awareness regarding climate change risks and effective adaptation. Overall, CCCA will allocate US$ 479,700 to achieving Outcome 3.

Output 3.1: Coastal communities use agricultural practices protected from changing climatic conditions and livelihoods are improved.

3.1.1. Pilot adaptation measures identified during the PPG phase (details in Table 2), i.e.:

[108] Additionally, this provides an opportunity to promote partnership between the Commune Councils and NGOs/CBOs for implementation of component activities. Sub-groups of the Commune Councils will only be utilised when councils are very large. Focus will be placed on utilizing the entire council, where feasible.

3.1.1.1. Rehabilitate 9 km of existing dykes (beyond baseline measures) in Ouk Gha Heng and Toul Tokoeng (Prey Nup District) to protect agricultural fields from increased flooding as a result of climate change.

3.1.1.2. Stabilise 15 ha of dykes by planting *Teap trus* trees[109] along their banks in Prey Nup, Ouk Yha Heng and Toul Tokoeng (Prey Nup District) to protect agricultural fields from increased flooding as a result of climate change.

3.1.1.3. Improve access to safe drinking water where drinking water is scarce and/or threatened by saline intrusion in Prey Nup (Prey Nup District) by providing 20 rainwater harvesting tanks to capitalise on increased incidences of heavy rainfall as a result of climate change.

3.1.1.4. Improve access to water for domestic and agricultural purposes where water is scarce by deepening an existing shallow natural lake in Toul Ki Kroum Village (Koh Kong) to have a capacity of 50,625 m^3. Importantly, an Environmental Impact Assessment will be carried out prior to undertaking this activity to investigate feasibility.

3.1.2. Determine the cost-effectiveness of each proposed demonstration activity. This will entail undertaking an economic analysis and performing cost-benefit analyses to ascertain which activities are most suitable.

3.1.3. Identify and pilot alternative livelihoods (in close cooperation with CCCA).

3.1.4. Capture lessons learned through implementation of Outcome 3's activities in a lessons learned report and distribute it to both the CCCA-funded knowledge management platform and the Adaptation Knowledge Platform.

Outcome 4: Resilience of coastal buffers to climate change increased and livelihoods improved.

Adaptation Alternative

131. A core component of the project is its focus on EBA (see paragraph 102) to demonstrate effective and 'no regrets' means to adapt to the adverse impacts of climate change. To this end, the project will rehabilitate areas of degraded mangrove forests in order to improve their efficacy as natural barriers to tropical cyclones, strong winds, SLR, storm surges and related flooding incidents (see paragraph 11). Additionally, the project will allocate resources towards stabilising sand on the Peam Krasaop beach, which protects not only mangrove forests from tropical cyclones and storm surges, but also a rural community along the coastal zone. In so doing, the project will reduce the vulnerability of coastal infrastructure and rural communities to such threats, the impacts of which are predicted to increase as a result of climate change. This, too, will contribute to the protection of agricultural production in low-lying areas of the coastal zone by reducing the impact of tropical cyclones, storm surges, tidal action and flooding.

132. Furthermore, the project will undertake assessments related to determining: i) the economic value of intact, healthy mangrove forests; and ii) the costs and benefits of alternative livelihoods anticipated to reduce the present level of pressure placed on mangrove forests. The results of these assessments will be disseminated to the relevant Commune Councils who will, based on this information, improve efforts to protect mangrove forests. Community members will also be made aware of the results of these assessments and, it is anticipated, will reduce the pressure they place on mangrove forests as a result. As such, the project will improve the functioning of natural coastal buffer systems directly through replanting efforts and indirectly through awareness raising and piloting of alternative livelihoods.

[109] Or an identified suitable alternative.

133. Project funds will also be allocated towards identifying and piloting alternative livelihoods (see examples in paragraph 124), in close cooperation with CCCA, to reduce the pressure local communities place on natural ecosystems, such as mangrove forests. In so doing, current levels of ecosystem degradation are likely to be reduced, which will further improve the functioning of such ecosystems as natural barriers to increased incidences of tropical cyclones, strong winds, SLR, storm surges and flooding as a result of climate change.

134. Specific adaptation measures to be implemented by the project are included in Table 3 below, and further information related to their selection and the demonstration sites is included in Appendix 18.

Table 3. Adaptation measures to be implemented by the project through activities within Outcome 4.

Intervention	Site	Details	Number of households benefiting
Koh Kong/Pream Krasaop District, Koh Kong Province			
1. Stabilise sand on Peam Krasaop Beach.	Peam Krasaop Beach	Plant trees (*Casuarina* species, or a suitable alternative species) over approximately 4 ha to stabilise sand on the beach and reduce coastal erosion and protect the old Peam Krasaop village from storm activity. Stabilising the beach sand will also contribute to protecting the mangroves surrounding the beach. This will cost $812/ha, i.e. a total of $3248.	46
2. Replant 90 ha of mangroves.	Prek 1, 2 and Prek Soch	Approximately 10,000 seeds per hectare will need to be planted and teams will need to be assembled to collect seeds from the water. This will cost $830/ha, i.e. a total of $74,700.	301

135. CCCA funds will support the interventions undertaken using LDCF funds under Outcome 4. Specifically, CCCA funds will be allocated towards complementary activities such as establishing and training the FWUCs/Commune Council members to serve as management committees for the on-the-ground adaptation measures, undertaking a joint awareness raising effort with existing ecosystems conservation projects, and facilitating field trips to demonstration sites for neighbouring community members to facilitate upscaling and learning. CCCA funds will also be allocated towards expanding upon LDCF-funded on-the-ground adaptation measures and piloting additional adaptation measures. Overall, CCCA will contribute US$ 640,700 to achieving Outcome 4.

Output 4.1: Ecosystem-based coastal protection through mangrove system restoration.

136. The implementation of the adaptation measures introduced below will be undertaken by NGOs with the relevant experience, where possible and applicable.

Activities:

4.1.1. Pilot no regret[110] adaptation measures identified during the PPG phase (details in Table 3), i.e.:

[110] 'No regret' adaptation options are those that are justified by current climate conditions and further justified when climate change is considered. (Lim. B, and E. Spanger-Siegfried. 2004. Adaptation policy frameworks for climate change: developing strategies, policies and measures. Cambridge University Press, Cambridge, UK pp 253.)

4.1.1.1. Undertake planting of trees (*Casuarina* spp.[111]) on dune systems (over approximately 4 ha) on the Peam Krasaop beach to stabilise sand and to protect mangrove ecosystems and vulnerable villages from increased storm activity as a result of climate change.

4.1.1.2. Undertake mangrove restoration of mudflats (over approximately 90 ha) in Prek 1, 2 and Prek Soch (Peam Krasaop district) to create coastal buffering against increased incidences of tropical cyclones, strong winds, SLR and storm surges.

4.1.2. Identify and pilot alternative livelihoods (in close cooperation with CCCA).

Output 4.2: Increased awareness on the importance of mangrove system restoration.

Activities:

4.2.1. Conduct socio-economic and biophysical assessments at the local level to determine the value of ecosystem services from mangroves (e.g. fuelwood, flood protection measures, fish breeding, carbon benefits[112]) and the costs of damaging mangroves (e.g. through unsustainable use and climate change impacts).

4.2.2. Conduct assessments at the local level of the socio-economic costs and benefits associated with particular alternative livelihood options (e.g. community-based fisheries, sustainable fuelwood production, eco-tourism, sustainable use of mangroves, integrated farming systems[113] and micro-enterprises) to reduce the pressure placed on mangrove forests.

4.2.3. Inform and advise Commune Councils in each of the coastal districts regarding the results of the assessments undertaken as Activities 4.2.1 and 4.2.2.

4.2.4. Develop policy briefs and guidelines for local application based on outcomes of Activity 4.2.3[114]. Such guidelines will be distributed to local communities based on the advice received from the Commune Councils.

4.2.5. Capture lessons learned through implementation of Outcome 2's activities in a lessons learned report and distribute it to both the CCCA-funded knowledge management platform and the Adaptation Knowledge Platform.

3.4. Intervention logic and key assumptions

137. The activities to be undertaken by the project were developed based on both the NAPA priorities (namely, 3G, 4B and 2) and several consultations with national, provincial and district authorities as well as with the affected communities within the coastal zone. Additionally, the activities are based on selection of largely 'no regrets' solutions, which are designed to provide benefits for local communities within demonstration sites even if the climate change impacts are not as severe as predicted.

138. The project will be implemented in parallel with the CCCA Coastal Component, which is undertaking complementary activities to those to be undertaken using LDCF funds. As such, the

[111] This species of tree was identified by the participants of the site selection meeting in Koh Kong (see Appendix 18) to be the best suited and fastest growing tree to grow on dune systems to stabilise beach sand. Efforts will be made prior to the implementation of this activity to identify an appropriate indigenous species as an alternative, if possible.

[112] e.g. Determine the feasibility of carbon income streams, such as Reducing Emissions from Deforestation and Forest Degradation (REDD) and Afforestation, Reforestation and Revegetation (ARR) on the voluntary market.

[113] Including diversifying crops farmed, providing loans to small-scale farmers and introducing livestock.

[114] All information dissemination tools utilised by the project (e.g. policy briefs and summary reports) will be packaged in an appropriate manner for local understanding and application (e.g. written in Khmer).

CCCA will act as parallel co-financing to the project. CCCA funds will be largely concentrated on implementing on-the-ground adaptation measures within the coastal zone. Where feasible, these measures will have been upscaled from adaptation measures implemented through LDCF funds. The approach taken to identify adaptation measures that can be upscaled to other areas of the Cambodian coastal zone using either CCCA funds or adaptation funding identified in the future is detailed in paragraph 126 and will involve: i) undertaking "economic experiments"; ii) assessing the economic viability of adaptation measures; iii) determining which adaptation measures are successful; iv) determining the barriers to upscaling of successful adaptation measures; and v) training local management committees to improve local adaptive capacity.

139. The project will reduce the vulnerability of both coastal communities and ecosystems and strengthen institutional capacity and adaptation planning in relation to anticipated climate change impacts on the coastal zone. Additionally, the project will improve the quality and availability of climate change-related science regarding the Cambodian coastal zone, which will include undertaking much-needed vulnerability mapping. To achieve this, the project, with assistance from CCCA-funded activities, aims to implement a set of urgent measures that will strengthen adaptive capacity at a national-level in Cambodia to predict and plan for future changes, while helping local populations to adapt through: i) the adoption of alternative livelihoods; ii) the protection of agricultural productivity; iii) the rehabilitation of natural ecosystems; and iv) the improvement of climate change awareness.

140. Overall, because the project's activities and outputs will be implemented following a "learning by doing" and "learning by sharing experiences" process, institutional capacity will be strengthened at the national-, provincial- and district-levels to facilitate the undertaking of vulnerability assessments and assessments of climate data and forecast simulations. In so doing, local expertise will be available for undertaking endeavours similar to those undertaken by the project in other coastal provinces/districts of Cambodia. At the same time, capacity will be built to facilitate the dissemination of project-related information and lessons learned to the knowledge management network, to be developed as part of the CCCA, as well as to the Adaptation Knowledge Platform (see Section 2.8). Importantly, to ensure the sustainability of project efforts, capacity will be strengthened within provincial- and district-level institutions in order to facilitate the introduction and acceptance of zoning and land use planning that incorporates future climate change risks.

141. The project has sought to build linkages with existing government policies and programmes, as highlighted above, so as to generate multiple benefits at the national, provincial and community levels. Furthermore, the implementation strategy will include measures providing targeted capacity building to ensure public participation in the planning and implementation activities. Lessons learned from the project will be disseminated widely through both the knowledge management platform established as CCCA Result 2 and the Adaptation Knowledge Platform (see Section 2.8).

142. Key assumptions underlying the project design include:

- Demonstration sites are best placed to demonstrate the benefits of measures to adapt to climate change.
- Climate change concerns are not overshadowed by other emergency matters or urgent projects.
- Local communities are willing to pursue alternative livelihoods.
- Large-scale infrastructural developments will not take place within the coastal zone during project implementation that will unduly disturb the coastal ecosystem or the project's planned activities.
- There is political commitment at the national and local levels to enforce existing regulations on the use and development of marine and coastal natural resources.

3.5. Risk analysis and risk management measures

143. The proposed project has strong government support, and no major risks to the achievement of the project's success have been identified. Risks and countermeasures are tabulated in the Risk log matrix included in Table 4 below.

Table 4. Risk log for the project with proposed mitigation measures.

#	Description of the risk	Potential consequence	Countermeasures / Management response	Type (Risk category)	Probability & Impact (1-5)
1	Institutions do not allow for inter-institutional data sharing, planning and implementation of actions for climate change adaptation measures.	Will hamper the effectiveness of the data network and thus limits the identification of appropriate adaptation measures and	Clear commitment from all relevant ministries/departments regarding data collection and distribution. Participatory stakeholder consultations have been undertaken to identify and clarify expectations and responsibilities and additional consultations will be undertaken during project implementation.	Political and organisational	P=2 I=3
2	Limited gain in livelihood related to agricultural protection measures and/or mangrove rehabilitation might reduce community participation.	Will hamper identification of additional adaptation measures and reduce community participation and acceptance of project activities.	Involving communities in selection of supporting practices and development of local ownership. The identification and piloting of alternative livelihoods is also a critical part of the project's activities, and these will ensure and demonstrate improved livelihoods despite climate change impacts.	Strategic, organisational and environmental	P=3 I=2
3	Extreme climate events such as floods and droughts could disrupt project activities and/or	May limit the demonstrability of implemented adaptation	Coordination will be undertaken with partners such as NCDM for disaster response in order to	Environmental	P=2 I=4

	damage ecosystems and infrastructure.	measures.	ensure that relief interventions are also directed towards demonstration sites impacted by any droughts or floods.		
4	Competing activities for land use could cause conflict in relation to the implementation of adaptation measures.	Will hinder the implementation of identified adaptation measures.	The project will plan interventions in close collaboration with local communities to avoid conflicts of interest.	Strategic and political	P=2 I=3
5	Limited activity of government staff due to the salary supplement problem in Cambodia, which have not yet been clarified between government and development partners.	Will limit the involvement and support provided by government staff and affect project management.	This is outside the project's control but it is understood that a solution will soon be reached between government and development partners.	Political and organisational	P=3 I=4
6	Lack of commitment from communities.	Threat to implementation and success of project activities.	The project will avoid a 'top down' approach and seek to create community ownership of all pilot interventions through participatory planning.	Strategic	P=1 I=3
7	Adaptation measures implemented are not found to be cost effective.	Potential for upscaling reduced.	Cost-effectiveness will be a core principle in the implementation of adaptation measures and those measures identified during the PPG Phase were found to be cost-effective based on preliminary information. Detailed information will be recorded regarding cost effectiveness, which will be of use to future adaptation endeavours and will be widely disseminated.	Strategic	P=2 I=2
8.	Activities financed by CCCA fail or CCCA-funded project staff does not contribute as	Potential for upscaling reduced and may reduce the scale of the	The risk of such situations is minimal given the CCCA Coastal Component implementation	Strategic	P=1 I=3

	required.	project. Reporting may be affected.	team's accountability to the four CCCA donor partners, namely SIDA, Danida, EU and UNDP. In addition, the project will engage in continual dialogue with the CCCA donor partners to mitigate these risks.		
9.	Mangroves replanted by the project are cut down by communities/	Hinder the success of the project's activities under Outcome 4.	Community involvement ('bottom up' approach) and awareness raising are likely to prevent this risk. The project team will also keep an eye out for the cause of the mangrove cutting.	Strategic	P=2 I=2

144. The Risk Log will be updated by the National Project Coordinator[115] (NPC) in cooperation with the Senior Technical Advisor (STA, see Section 4 for more details) and the status of existing risks will be re-assessed. Emerging risks (e.g. land use changes, potential new development plans in demonstration sites) will also be recorded, based on consensus by the Project Steering Committee (PSC[116], see Section 4 for more details) that these new risks may affect the implementation of the project.

3.6. Consistency with national priorities or plans

145. The NSDP (2006-2010) clearly articulates the RGC's objectives of achieving national economic growth and poverty reduction. The goals regarding preservation, conservation and sustainable use of all the country's natural resources are not only to conserve Cambodia's unique natural heritage but also to enhance environmental sustainability and to contribute to sustainable economic growth, poverty reduction and improvements to the living conditions of rural communities. The project will play an important role in achieving these goals through *inter alia* rehabilitating ecosystems, raising awareness, reducing the pressure placed on natural ecosystems, introducing alternative livelihoods and protecting agricultural production.

146. Additionally, the RGC is promoting the contribution of the forestry sector (which includes mangrove forests) to poverty reduction by strengthening community forestry. The RGC recognises joint priorities among major national institutions and external stakeholders in alliance with local government as the optimal mechanism for rehabilitation of mangrove and forests. The project will contribute directly to this government priority through the rehabilitation of degraded mangrove forests in collaboration with local government and communities, whilst also raising awareness regarding the need to rehabilitate degraded mangrove forests.

[115] Within the context of the CCCA, this person will be referred to as the Coastal Component Coordinator (CCC).
[116] Within the context of the CCCA, this committee will be referred to as the Component Steering Committee (CSC).

147. The Cambodian National Biodiversity Strategy and Action Plan points clearly to ensuring the protection of mangrove forests and coastal zones in general as well as to facilitating community participation in coastal resource planning and management, mangrove reforestation, and preparing and implementing management plans (including land use/zoning for mangrove areas). All of these aspects are central to the project, making it well aligned with the National Biodiversity Strategy and Action Plan. Specifically, the project will contribute to this plan by: i) directly rehabilitating vulnerable areas of mangrove forest in the demonstration sites; ii) protecting areas within the demonstration sites that are particularly susceptible to storm-inflicted erosion; and iii) facilitating community participation in coastal resource planning and management as well as mangrove rehabilitation.

148. Cambodia's Strategy for Agriculture and Water (2006-2010) aims to contribute to reducing poverty, improving food security and promoting economic growth by: i) enhancing agricultural productivity and diversification; and ii) improving water resources development and management. This aim will be achieved principally by: i) more efficient use and management of water and land; ii) increased agricultural productivity; and iii) institutional capacity building. The activities included in the project thus link closely to the stated aims of this strategy.

149. Additionally, the project will contribute to the achievement of CMDGs 7 ("ensuring environmental sustainability") and 1 ("eradicate extreme poverty and hunger") by: i) improving the resilience of natural coastal buffering systems (e.g. mangrove forests) to climate change impacts; ii) promoting the sustainable use of coastal resources; iii) improving agricultural production in the face of climate change; and iii) improving community livelihoods under climate change conditions. In so doing, the project will also contribute towards the achievement of the following UNDAF Outcome 1: "by 2010, achieve significant progress towards effective participation, accountability and integrity of government in decision making and policy implementation for the full realisation of human rights and meeting the CMDGs"[117]. At present, both of the abovementioned CMDGs are considered to be off-track[118]. To date, Cambodia has not yet achieved any of its nine CMDGs.

150. The project will also contribute to UNDAF 2 "by 2010, agriculture and rural development activities have improved livelihoods and food security, as well as reinforcing the economic and social rights of the most vulnerable in targeted rural areas"[119] by improving livelihoods and agricultural activities in the demonstration sites in the face of climate change.

151. As already mentioned, the project is also well aligned with the following priorities identified through the Cambodia NAPA process: 3G ("rehabilitation of coastal protection infrastructure"), 4B ("community mangrove restoration and sustainable use of natural resources") and project 2 ("assessment of needs for setbacks, vegetation buffers and protection structures in coastal zones").

3.7. Additional cost reasoning

152. The anticipated costs associated with climate change-induced damage within the Cambodian coastal zone are, without effective adaptation, likely to increase over time. In anticipation of the likely impacts, the project will contribute towards reducing these anticipated costs by implementing priority NAPA interventions as well as other appropriate adaptation measures. Additionally, without the project, it is unlikely that communities within the Cambodian coastal zone will be able to withstand or adapt to the threats climate change and climate variability pose to their livelihoods and to the coastal

[117] United Nations Development Assistance Framework (UNDAF), Cambodia 2006 – 2010.
[118] United Nations Development Goals, Kingdom of Cambodia. Available at: http://www.un.org.kh/undp/CMDGs/What-are-the-Cambodia-Millennium-Development-Goals.html.
[119] United Nations Development Assistance Framework (UNDAF), Cambodia 2006 – 2010.

zone in general. The implementation of risk reduction measures identified by the project for particularly vulnerable communities/areas within the coastal zone will contribute towards improving current coping strategies employed by vulnerable coastal communities to climate variability and change (see paragraph 24) and thereby enhance their preparedness and resilience towards adverse climate change impacts. Overall, the project aims to capacitate both public and private stakeholders in order to reduce their vulnerability to climate change impacts within the coastal zone.

153. Specifically, the project will strengthen national policy, regulatory and institutional coordination at the national level for managing climate change adaptation, and provide scientific tools for proper adaptation planning (Outcomes 1 and 2). Additionally, the project aims to demonstrate effective measures to improve the resilience of coastal communities, productive systems and coastal ecosystems at the local level to withstand adverse climate change impacts (Outcomes 3 and 4). These aims will be realised through the achievement of the following outcomes:

154. **Outcome 1: Institutional capacity to assess climate change risks and integrate them into national development policies strengthened.** At present, coordination and integration of climate change measures between line ministries is lacking at the national level. Although the CCD was established in the MoE to support the NCCC in 2003[120], it has done so with limited success to date.

155. The project will allocate resources to strengthen inter-sectoral coordination at the national level and improve institutional capacity to identify and implement effective adaptation plans within the coastal zone, in particular by: i) providing policy advice related to the inclusion of climate change considerations into relevant coastal policy to develop an enabling environment at the national level; ii) strengthening awareness and capacity within relevant national-level institutions and departments (including the CCD, NCCC and MoE) related to climate change impacts and adaptation within the coastal zone; and iii) improving climate change-related scientific knowledge regarding impacts and scenarios for the coastal zone. Outcome 1 will also reinforce institutional as well as technical and technological capacity to implement integrated natural resources management within the coastal zone in the context of a changing climate. Without the project's proposed intervention, it is unlikely that concrete actions will be taken to integrate climate change adaptation in coastal zone management. Resources will also be allocated towards assessing climate change risks on the coastal zone by undertaking climate risk modelling, which can be used by the relevant line ministries and local communities to provide budget for the necessary adaptation measures to be implemented on a proper scientific planning background. A multi-sectoral approach to climate change adaptation is essential due to the cross-sectoral nature of climate change impacts. The project will enable data-sharing between ministries and other institutions by establishing a data network in order to gather a full complement of climate-related data for the development of adaptation measures.

156. In the absence of the outcome, the lack of inter-sectoral coordination regarding climate change adaptation within the coastal zone will remain to the detriment of vulnerable sectors and communities. Additionally, capacity at the national level to identify and implement adaptation measures within the coastal zone will remain insufficient and national policies and plans will not benefit from the inclusion of identified climate change risks on the coastal zone. Furthermore, monitoring of climate change impacts within the coastal zone will not be undertaken, which will prevent effective adaptation planning.

157. **Outcome 2: Adaptation planning in the coastal zone improved.** To date, extensive development[121] has been carried out within the Cambodian coastal zone. However, this development

[120] Originally the CCD was known as the Climate Change Office. The name changed in 2009.
[121] Mainly private funded development.

has been implemented without consideration of climate change impacts and has placed local communities in highly vulnerable areas without the necessary tools or systems to effectively adapt to predicted climate change impacts. Furthermore, coastal development takes place without consideration of setback lines and zoning, thereby rendering the coastal zone (including infrastructure within the coastal zone) more vulnerable to tropical cyclones, strong winds and storm surges, which are likely to be exacerbated by climate change. Additionally, current setback lines and zoning arrangements were determined in the absence of a climate change risk assessment and are thus unlikely to protect coastal development from future climate change risks even if they were considered by developers. In the absence of this outcome, Cambodia would see continued uncoordinated planning and development of the coastal zone without due attention given to the consequences of the concomitant increase in the vulnerability of coastal communities, infrastructure and ecosystems.

158. To improve this situation, the project will allocate resources to producing detailed vulnerability maps for climate change planning purposes within the coastal zone. The activities undertaken towards Outcome 2 will contribute towards the establishment of a climate change-resilient coastal development regime that will be able to withstand anticipated increased frequency of climate-induced coastal inundations and storm surges through the provision of setback lines and zones based on coastal vulnerability and predicted SLR. It is expected that the achievements and approach applied for the coastal zone could be replicated in other parts of Cambodia, using the established capacity developed during the project's implementation.

159. Additionally, resources will be allocated towards improving institutional capacity at the provincial- and district-level to identify and implement appropriate adaptation measures within the coastal zone. As a result of these activities, a local-level participatory adaptation plan will be developed, which will earmark particularly vulnerable coastal sites and appropriate adaptation measures for funding identified in the futures.

160. In the absence of this outcome, vulnerability mapping within the coastal zone related to anticipated climate change impacts will not occur, which will hinder the efficacy of future development plans and future adaptation endeavours. Additionally, capacity at the provincial- and local-levels to identify and implement adaptation measures is likely to remain insufficient in the absence of the project's adaptive capacity-building efforts. Development within the coastal zone will continue to be uncoordinated and be undertaken without appropriate zoning and land use planning, given climate change impacts. This will result in further degradation of natural coastal buffering systems. Importantly, in the absence of the outcome, an adaptation plan to coordinate adaptation and guide future funding within the coastal zone will not exist.

161. **Outcome 3: Vulnerability of productive systems to increased floods reduced.** Presently, rice production within the coastal zone is inadequate to meet local demand and significant development assistance efforts have been undertaken to increase production and provide protection measures that alleviate flooding risks, such as dykes. A system has been established between national government and the FWUCs to ensure the operation and maintenance of these protection measures. However, SLR and other adverse climate change impacts (e.g. increased cyclonic activity and storm surges) have not been considered in the design of the protection measures. For example, the present height of many dykes is likely to be too low to effectively protect agricultural fields from increased flooding risks.

162. Outcome 3 will thus seek to address the climate change-induced increased risk of flooding (both as a result of increased variability of rainfall and as a result of increased SLR and storm surges) on agricultural productive systems in communities identified as being particularly vulnerable to climate change.. Additionally, adaptation measures will be carried out in the demonstration sites to

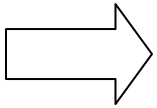
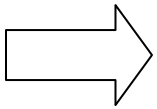
rehabilitate existing dykes beyond baseline measures to counter the increased risk of flooding. It is expected that the interest and willingness of the local communities to participate actively in the adaptation measures will be further ensured if they are able to secure a better livelihood as part of the project's adaptation measures. Hence, resources will also be allocated towards identifying and piloting alternative livelihoods in order to improve income streams despite climate change (or offset any potential losses to agricultural productivity as a result of climate change), as well as to improving water supply in areas where water supply is threatened by increased saline intrusion. The outcome's demonstration component is expected to provide significant and tangible benefits for the coastal communities, which is likely to result in replication in other areas experiencing similar impacts.

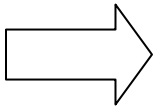
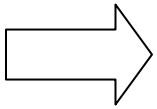
163. In the absence of this outcome, agricultural productivity within the demonstration sites will continue to be reduced by climate change and variability. This will be the case largely as a result of the limited capacity of provincial- and district-level stakeholders to act against climate change impacts and the limited understanding regarding climate change and adaptation of local communities. Additionally, existing protection measures are unlikely to adequately protect agriculture fields from increased flooding and SLR as they were not designed with climate change impacts taken into account. Levels of poverty and food insecurity will continue to increase as current community coping strategies are largely inappropriate, particularly given predicted climate change.

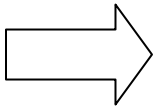
164. **Outcome 4: Resilience of coastal buffers to climate change increased and livelihoods improved.** Currently, local communities and developers are exerting considerable pressure on natural ecosystems within the coastal zone, such as mangroves forests. Intact mangrove forests are particularly important within the coastal zone due to their ability to function as effective buffers against tropical cyclones, tidal activity and storm surges. Indeed, this is but one of the many valuable functions provided by intact mangrove forests (see paragraph 11). Mangrove forests in many areas within the Cambodian coastal zone have been degraded, their wood used for fuelwood and the land used for salt pans, for example. In so doing, these areas are more sensitive to tropical cyclones, strong winds and storm surges and rehabilitating the mangrove forests in these areas is critical in order to protect local communities and productive systems against the anticipated increase in these threats as a result of climate change. Resources will be allocated towards rehabilitating degraded mangrove forests and also to assessing and introducing alternative livelihoods for the communities currently reliant on the mangrove systems as an income stream. Additionally, the costs and benefits associated with degraded and intact mangrove forests will be determined in order to make a strong case for the protection of such natural resources.

165. In the absence of this outcome, degradation of key coastal climate buffers, such as the important mangrove forests, and unsustainable exploitation of these systems at the demonstration sites will continue unabated as few alternatives exist for local populations. Additionally, SLR will likely contribute to additional degradation of mangrove forests by altering the saltwater concentration in the estuarine waters. This will increase environmental vulnerability as well as potentially hamper another critical livelihood, as mangrove forests provide protective breeding grounds for numerous high-value fish species.

166. The table below depicts the baseline/business-as-usual situation versus the adaptation scenario.

	Business-As-Usual		Adaptation alternative scenario
Problem Description	The majority of the population within the Cambodian coastal zone is engaged in rain-fed agricultural production with limited access to technology and irrigation systems. Additionally, agriculture is concentrated in low-lying areas due to the fertility of such areas, rendering crops particularly vulnerable to tropical cyclones, floods, tidal activity and SLR. Water resources are inadequately developed and subjected to saline intrusion. As a result of poor development in the agriculture sector, farmers are limited to only one harvest of rice per year. Poverty levels are high and food security is threatened by climate variability. Unsustainable use and the resultant degradation of natural coastal buffering systems has left coastal communities particularly vulnerable to tropical cyclones, strong winds and storm surges. Climate change is likely to reduce agricultural productivity, impact negatively on livelihoods and degrade productive and protective ecosystems within the Cambodian coastal zone. Coastal communities, district leaders, provincial leaders and national government presently lack the technical capacity, climate change knowledge, management capacity as well as the physical and financial resources to overcome and withstand the anticipated climate changes impacts. Whilst adaptation-orientated projects are lacking in the coastal zone, baseline development - which does not consider anticipated climate change impacts in its design/planning - is ongoing. Two such baseline development initiatives, in particular, are relevant for the project as they are underway within the project's demonstration sites. These two initiatives will serve as baseline co-financing for the project.		Climate change is predicted to increase the frequency and intensity of flooding events, increase temperatures and result in SLR within the Cambodian coastal zone, which will reduce agricultural productivity, increase poverty levels, increase food insecurity levels, reduce water security and further degrade natural ecosystems. To address this problem, the Implementing Agency is facilitating the implementation of an adaptation project within the coastal zone, based on NAPA priorities.
Project outcomes	Outcome 1 • Institutional capacity to effectively manage natural resources and ecosystems as well as to adapt to climate change impacts and risks is limited. • Inter-sectoral coordination on matters related to climate change and adaptation is weak. • Institutional responsibility pertaining to land use planning and management of natural resources within the coastal zone is unclear. • Technical and financial capacity at the national- and provincial-levels is inadequate, which makes it difficult for relevant institutions to undertake effective adaptation planning and management within the coastal zone. • The numbers of staff members within ministries at both the national- and provincial-level with adequate capacity is limited. • The majority of capacity development to date has focused on broader aspects of climate change, rather than enabling identification of climate change vulnerabilities, forecasting and adaptation planning.		The project will contribute to improving on the baseline situation and to addressing identified barriers to the preferred solutions, particularly in relation to climate change adaptation within the coastal zone by *inter alia*: • Establishing a data network between relevant ministries and departments and thereby improving inter-sectoral coordination regarding climate change and adaptation within the coastal zone through. • Strengthening institutional capacity at the national level related to the identification and application of adaptation measures within the coastal zone. • Assessing climate change risks on the coastal zone through climate modelling. • Enabling the incorporation of climate change risks into national development plans and policy. • Establishing a monitoring/indicator system to track climate change

	• Ongoing climate hazard programmes in Cambodia focus on reactive emergency relief rather than forward-looking reduction, preparedness and adaptation.		impacts and vulnerability to climate change after the project lifetime. Total costs: LDCF US$ 498,400; CCCA estimation US$ 315,000.
	Outcome 2 • Policy framework for coastal zone development is weak and inadequately enforced. • Coastal development takes place without consideration of setback lines and zoning. • Lines and zoning are not determined taking into account climate change knowledge. • Extensive development has been carried out in the coastal provinces without consideration of climate change impacts and future risks, and at present no mechanism exists for climate-proofing these projects. • Vulnerability to natural disasters assessments, carried out by the NDCM in collaboration with the ISDE and ADPC, were limited by funding and consequently only two coastal provinces were assessed. Consequently, detailed vulnerability maps for coastal communities and ecosystems are presently not available for Cambodia.		The project will contribute to improving on the baseline situation and to addressing identified barriers to the preferred solutions, particularly in relation to climate change adaptation within the coastal zone by *inter alia*: • Undertaking extensive vulnerability mapping exercises to highlight areas particularly vulnerable to climate change impacts. • Strengthening institutional capacity at the provincial- and local-levels related to the identification and application of adaptation measures within the coastal zone. • Raising awareness of the importance of appropriate zoning as an adaptation option. • Creating a consultative forum in order to engage private sector partners in matters related to adaptation and climate change risks within the coastal zone. • Developing a participatory local-level adaptation plan to guide future adaptation funding within the coastal zone. Total cost: LDCF: US$ 400,750; CCCA estimation US$ 459,600.
	Outcome 3 • Adaptive capacity is low within rural communities along the coast, largely attributable to high poverty levels and limited knowledge regarding climate change and adaptation. • The majority of agricultural activities are concentrated in low-lying areas and are consequently frequently hampered by floods, tidal activities and storm surges, the incidence of which is likely to be exacerbated by climate change. • Crop diversity is limited within the coastal zone. The main crop is rice. • Limited irrigation development limits rice production to one harvest per year. • Protective dams to prevent occurrence of seawater flooding are commonly not high enough to protect fields from flood damage. • The height of many dykes constructed to protect agricultural fields was not determined with climate change impacts in mind. Consequently, agricultural production is frequently subjected to adverse climatic conditions due to inappropriate protective measures. Baseline development pertaining to: i) improvement of agricultural productivity through the protection of agricultural fields; and ii) appropriate management of water resources, including agricultural and drinking water provision, under the MoWRAM project 'Rehabilitation of Prey Nup Reservoir' (US$ 1.4 million) will serve as baseline co-		The project will contribute to improving on the baseline situation and to addressing identified barriers to the preferred solutions, particularly in relation to climate change adaptation within the coastal zone by *inter alia*: • Facilitating the rehabilitation of existing protective measures in vulnerable sites beyond baseline measures (including raising their level and stabilizing them) in order to protect agricultural productivity against climate change-induced increased flooding, storm surges and SLR. • Introducing alternative livelihoods to offset potential reductions in income streams as a result of climate change impacts in the agriculture sector. • Improving access to water for drinking and agricultural purposes in sites where water is threatened by saline intrusion and/or where water access is limited. • Raising community awareness regarding climate change and adaptation in order to improve existing coping strategies presently adopted by local communities (see paragraph 24). Topics covered will include i) climate change and its impacts on the agriculture sector and ii) adaptation options for local communities.

	financing.		Total cost: LDCF: US$ 397,104; CCCA estimation US$ 479,700.
	Outcome 4 • Mangrove forests within the Cambodian coastal zone have been significantly reduced as a result of human pressures (12% reduction between 1997 and 2005). • Mangrove cover within Koh Kong Province, the province in which the project will improve the resilience of coastal buffer systems, has been reduced by over 700 hectares as a result of anthropogenic pressures. • Mangrove clearing is an unsustainable activity, undertaken largely for firewood or charcoal production, or as a result of investment activities such as salt pans, land reclamations and intensive shrimp aquaculture. If such activities continue under Business-as-Usual, mangroves will continue to be degraded thus rendering coastal communities, infrastructure and agriculture increasingly vulnerable to climate change impacts. • Natural coastal buffering systems are presently inadequate to best mitigate the impacts of tropical cyclones, tidal activity and storm surges as a result of degradation. • Mangrove degradation also negatively affects the economy as intact mangrove forests support numerous commercial fish species and other marine organisms. Populations of such fish species and marine organisms will also become further pressurised as a result of increasing sea surface temperatures, thus by restoring mangrove forests, the resilience of such species will be improved. • Baseline investments regarding mangrove restoration within the coastal zone include the PMMR project which was implemented by the MoE and IDRC. This project focused on sustainable community-based natural resources management through strengthening human capital, improving the value of resources and local livelihoods, working on cross-commune resources management and sharing and adapting lessons from the research; and has experienced great success. The lessons learned from this project will be built upon and used by the project. • SLR will adversely affect mangrove functioning by upsetting the saltwater concentration of the estuarine waters that mangrove species depend on, which may lead to further deaths of areas of mangrove forest. Baseline development pertaining to appropriate management of mangrove forest resources, under the MAFF project 'Forestry reforms: Proper Management of Mangrove Forest Resources' (US$ 400,000) will serve as baseline co-financing.		The project will contribute to improving on the baseline situation and to addressing identified barriers to the preferred solutions, particularly in relation to climate change adaptation within the coastal zone by *inter alia*: • Rehabilitating mangrove forests in degraded areas to improve their efficacy in protecting coastal communities, infrastructure and agriculture against storm surges, strong winds and SLR, which are likely to increase as a result of climate change. • Stabilising other coastal buffer systems (e.g. dune systems) to further protect mangrove systems and vulnerable communities from increased storm surges and SLR. • Introducing sustainable alternative livelihoods to reduce anthropogenic pressure placed on mangrove forests. In so doing, the degradation of mangrove forest cover will decrease, thereby improving the efficacy of the mangrove forests as buffers against climate change-induced impacts. • Assigning monetary values to ecosystem services provided by intact buffer systems to catalyse additional restoration efforts and policy changes. Improved restoration efforts will further contribute to improving the efficacy of the mangrove forests as buffers against climate change-induced impacts. • Raising awareness of national- and local- level stakeholders to improve knowledge on climate change, in order to facilitate further protection of coastal buffer systems by enabling policy changes. Total cost: LDCF US$ 273,366. CCCA estimation US$ 640,700.
Cost	Business-As-Usual Development Cost		Additional Adaptation Cost
Financed By	MoWRAM and MAFF		LDCF and CCCA

3.8. Sustainability

167. The MoE's and RGC's ownership of the project is critical to ensuring the sustainability of the project's interventions beyond the project lifetime. It is also for this reason that high importance will be assigned to staff to be nominated by the government to coordinate and/or support the implementation of the project. Importantly, the project was developed in close collaboration with government, leaders at the provincial-, district- and commune-level within coastal provinces, as well as with community members and national-level stakeholders, in order to ensure ownership of the project's activities. With similar purpose, considerable attention will also be dedicated to both traditional capacity building and more innovative 'learning on the job'. To this end, human capital will be built within the government itself at different levels, with a focus on the provincial level, within the pool of national technical consultants, and members of communities in the demonstration sites. As a result of the capacity building exercises undertaken, the capacity of staff working within the project to develop and implement effective adaptation measures will be significantly strengthened, which will be beneficial for future projects within Cambodia as well as for public and private positions.

168. To further strengthen within-country capacity to facilitate the development and adoption of effective adaptation measures across Cambodia, the project will incrementally reduce the level international technical assistance provided to the project. Instead, emphasis will be placed on capacitating national consultants. This, too, will contribute to the sustainability of project interventions. Presently, the strategy is to reduce the involvement of the STA during Year 1 (full-time) in Years 3 – 4 based on the in-house capacity that is developed through the project. A higher level of responsibility will be therefore transferred to the NPC and the technical/administration team under him/her. The reduction of STA contributions during his/her appointment will allow the structure to demonstrate its capacity while still having access to financing and technical assistance. This approach is realistic based on the capacity already established within the CCU, the project's counterpart department.

169. Furthermore, the project will draw heavily on previous experiences with similar projects/programmes in Cambodia (particularly the Danida project, see Section 2.7). In this way, the project will follow successful methods and avoid pitfalls experienced by previous projects/programmes. Additionally, the project will closely follow the RCG's D&D efforts and ensure that all project activities are well aligned with the Commune Development Plans within the coastal zone, which is likely to ensure their sustainability beyond the project lifetime. The project will also employ the use of the FWUCs and/or Commune Councils within demonstration sites to manage adaptation measures. In this way, capacity will be strengthened at a local level to ensure that adaptation measures are operational and maintained after the completion of the project. Training undertaken as part of the project activities will ensure the improvement of capacity at all levels as well as develop technical capacity where required. Additionally, if the adaptation measures are successful and tangible benefits arise through their implementation, it is highly likely that such activities will remain successful beyond the project lifetime and may potentially be upscaled to neighbouring communities/provinces. The inclusion of climate change considerations into national policy and local-level development plans will create an enabling environment for effective adaptation and thus also contribute to the sustainability of project interventions as well the project's efforts to improve institutional coordinated related to climate change matters.

3.9. Replicability

170. The project is being piloted in two districts in two of the four provinces within the Cambodian coastline. There is thus considerable potential for replication within the remaining districts and two

provinces within the coastal zone. To facilitate the effective replication of project activities, the project will disseminate its lessons through two knowledge management platforms, namely the platform developed as part of the CCCA's Result 2 and the Knowledge Platform (see Section 2.8). In so doing, the project will inform future endeavors within the coastal zone and in similar areas abroad. Additionally, local-level stakeholders will be capacitated and involved in the implementation of project activities and, provided the activities deliver tangible benefits, thus they will be likely to replicate such activities in additional sites.

171. The close involvement of government institutions and departments in the project's development and implementation promises potential for future incorporation of the project's approaches into on-going planning and strategies. Additionally, it is expected that the strengthening of capacities among key government stakeholders will enable continued mainstreaming of climate considerations into sectoral planning and decision-making.

172. Furthermore, the extensive training and capacity building of local communities and technical staff regarding adaptation measures will ensure that future endeavours within the coastal zone are climate-resilient as demonstrated in the adaptation measures. In so doing, project interventions will be ensured into the future and are more likely to be replicated and/or upscaled.

3.10. Public awareness, communications and mainstreaming strategy

173. At present, local awareness and understanding regarding climate change and its predicted impacts is low in Cambodia. Raising awareness and sensitizing coastal communities, decision-makers and planners is a central component of the project. Awareness will be raised on climate change and its impacts as well as on the project's adaptation measures at the local level through the distribution of training materials (in local vernacular) to community members within the demonstration sites. Furthermore, the project will conduct joint education and awareness raising activities with existing ecosystem conservation projects in the demonstration sites in order to highlight the efficacy of sustainable natural resource management practices as a means to reduce climate change impacts. Additionally, as mentioned above, project lessons will be disseminated through two knowledge management mechanisms, which will reach a large audience both within Cambodia and across Asia (in particular through the Knowledge Platform[122]).

174. In keeping with the participatory approach adopted by this project, coastal communities and all vulnerable groups will be engaged with to participate in the implementation of adaptation measures. Mainstreaming of adaptation into national- and local-level planning will be addressed through Outcomes 1 and 2, in particular. Although the project does not have a communication strategy, the project design has relied extensively on stakeholder consultation and input. Additionally, the project's institutional arrangements are seated within government institutional structures and thus the project will be working across ministries on a daily basis. Furthermore, results of the risk assessments will be communicated through activities within Outcome 1, whilst all project lessons will be captured and disseminated at a national and international level, as detailed in paragraph 173. The project will also communicate and share information with relevant ongoing projects/programmes in Cambodia (see Section 2.8) and draw on lessons from relevant past projects/programmes in Cambodia, in particular the Danida project 'Environmental Management within the coastal zone' (see Section 2.7 and Appendix 16). To achieve this, a project manager's coordination working group will be established comprising managers from relevant projects/programmes in order to coordinate efforts, share lessons and avoid overlap. The working group will meet on an annual basis during project implementation.

[122] The Knowledge Platform (full name: Regional Climate Change Adaptation Knowledge Platform for Asia and Asia Pacific Adaptation Network) is specifically targeting Asia and Asia Pacific.

3.11. Environmental and social safeguards

175. The proposed adaptation measures included in the project are not intended or anticipated to have adverse environmental impacts. Indeed, the activities related to mangrove restoration, in particular, are considered 'no regrets' measures. Additionally, the project will close follow the guiding principles of sustainable natural resource management and EBA. However, Strategic Environmental Assessments and/or Environmental Impact Assessments will be undertaken where necessary in accordance with Cambodian law, in order to ensure that the adaptation measures will not generate adverse environmental impacts. The project will focus on improving resilience and reducing vulnerability of coastal ecosystems and communities to adverse climate change impacts and, for this reason, adaptation measures are largely centred on restoring ecosystem services and improving degraded ecosystems (e.g. mangrove forests). The secondary effect of these efforts is likely to include reduced coastal erosion, thereby providing additional benefits to the coastal environment within the demonstration sites.

176. Regarding social safeguards, the project will contribute to national plans in promoting the sustainable development of the country. Communities residing within the coastal zone have been consulted and their culture and traditional practices were integrated into NAPA preparation, project preparatory phase as well as this project formulation process. Additionally, communities within the demonstration sites will be consulted during all stages of project implementation and will be involved in the adaptation measures in order to generate ownership of the project.

177. Efforts to promote gender equity will also be integrated in all aspects of the project's activities and management, including through the development and use of gender-disaggregated indicators where relevant (see Project Results Framework in Appendix 4), as well as through the conscious integration of gender-based groups in community-based activities (including training as well as the piloting and developing of alternative livelihoods). Climate change has a distinct gender dimension in that women (as well as children and the elderly) are more exposed to the adverse impacts of climate change. Moreover, women traditionally tend to have less influence over decisions related to climate change adaptation. From this perspective, it is imperative that the project's adaptation measures at the community level are designed to ensure that women's perspectives are reflected and that women are represented with regards to decisions affecting their livelihood. Existing tools and those developed during project implementation will be explicitly inclusive of gender criteria. Reporting on the project's progress will place special emphasis on how women are engaged in the various project activities.

SECTION 4: INSTITUTIONAL FRAMEWORK AND IMPLEMENTATION ARRANGEMENTS

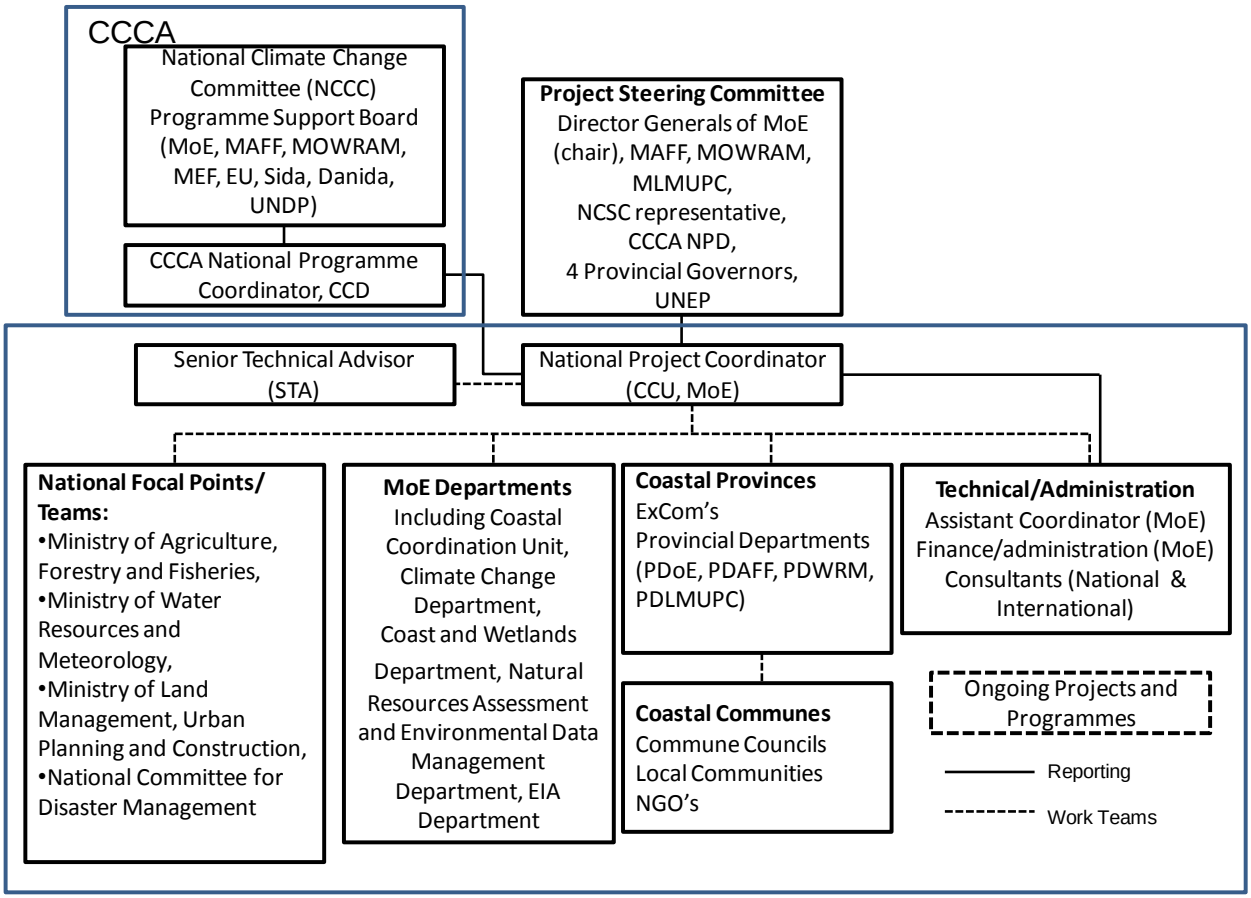


Figure 9. The project's management structure.

178. UNEP will be the Implementing Agency (IA) for the project and will oversee and provide technical backstopping to the project (see details regarding UNEP's comparative advantage in Appendix 21). The MoE will be the Executing Agency of the project. UNEP will work closely with the CCU and the Project Steering Committee (PSC) during project implementation. Overall, the project will be implemented with the support of several national government, local government and non-government partners as indicated in the management structure in Figure 9.

Management Structure

179. The project's management structure is based on strong government ownership and aligned to the existing government institutional arrangements with the CCCA (see Appendix 20 for more information relating to the CCCA). The MoE will be the Government Executing Agency (EA). To ensure national ownership, the project will report to the NCCC as the government-designated body for climate change coordination in Cambodia through the project's full-time project coordinator, the NPC, who will work under the CCCA National Programme Coordinator. The NPC will be responsible for the overall management of the project and will ensure that it is managed in an effective, transparent and accountable manner in line with approved work plans and budgets and in accordance with GEF and UNEP guidelines.

180. The project will be largely based in the CCU (within the MoE) and the Director of the CCU will be the NPC. The CCU has been the core unit supported through Danida's development efforts within Cambodia, and has become increasingly responsible for the implementation of projects along the coast. This capacity will now be built upon during the implementation of the project in order to

provide a ready working structure. The CCU also functions as the Secretariat in MoE for the NCSC. The NCSC was established in 2001 in order to facilitate coastal zone management and to protect the environment and natural resources within the coastal zone, in an effort to improve the living conditions for the coastal population through the sustainable use and development of the coastal zone.

181. The NPC will be supported by a dedicated Assistant Coordinator to whom the NPC will delegate work. The Assistant Coordinator will be a full-time position and will work closely with the NPC to manage the project's activities. Additionally, the Assistant Coordinator will work closely with the NPC's other technical/administration staff and serve as a liaison between the NPC and the technical/administration staff. The Assistant Coordinator will be nominated from the Department of Coastal Zones and Wetlands.

182. In addition, a Senior Technical Advisor (STA) will be hired to provide technical guidance on the implementation of the project to the NPC. The STA will also assist the NPC in leading the project. The STA will fulfill the following functions: i) quality assurance and technical review of project outputs (e.g. studies and assessments); ii) assistance in drafting TORs for technical consultancies and supervision of consultants work; iii) assistance in monitoring the technical quality of project M&E systems, including annual workplans, indicators and targets; iv) providing advice on best suitable approaches and methodologies for achieving project targets and objectives; v) provide a technical supervisory function to the work carried out by the other technical assistance consultants hired by the project; and vi) assisting in knowledge management, communications and awareness raising. The STA position will be filled following a transparent and competitive recruitment process which will commence as soon as possible. The STA will be utilised full-time during the first year and thereafter involvement of the STA will be reduced[123]. In this way, the project will strengthen and establish in-country capacity and ensure that project activities are sustainable after the project lifetime.

183. Additional staff employed to provide technical and administrative support include the consultants (both national and international) and an administration/finance assistant. Consultant descriptions are included in the budget notes (see Appendix 1). International technical assistance will only be requested for specialised tasks where insufficient capacity is available among government staff or national consultants, and in consultation with the NPC. ToRs for project staff (not including for the international and national consultants) are included in Appendix 11. Additionally, the Departments of Climate Change, Coastal Zones and Wetlands, Environmental Impact Assessment, and Natural Resource Assessment and Environmental Data Management will appoint staff to contribute to project implementation.

184. Other roles and duties of the CCU include:

- Coordinating between key line ministries and relevant departments in implementing the Coastal Environment Action Plan.
- Coordinating between regional and national institutions and donors on coastal issues.
- Monitoring and advising the RGC for the purpose of harmonizing policies, plans and legal framework concerning coastal zone management with national development priorities, conventions and international laws on coastal zone management.
- Preparing regular annual reports on its activities and outcomes and providing recommendations to the RGC.
- Providing advice and guidance on coastal zone management.

[123] As part of the exit strategy, the amount of time the STA will be contracted for will be reduced over the project lifetime. For example, the STA will likely work full-time in Year 1, and the time worked by the STA will then be reduced for the following years, which will be approved by the NPC.

- Seeking financial and technical assistance to support the NCSC's operation.

185. During implementation, the CCU will work closely with key departments such as the CCD, the Department of Coastal Zones and Wetlands (which is responsible for land located in protected areas), and the Natural Resources Assessment and Environmental Data Management Department. The actual outputs will be provided through inter-sectoral working groups drawing on staff from relevant ministries, provincial departments, districts and Commune Councils.

186. A specific PSC will be established for the project and will comprise senior technical representatives (Director Generals) from the key ministries (MoE, MAFF, MoWRAM, and MLMUPC), a representative from the NCSC, the Governors[124] of the coastal provinces (Kampot, Koh Kong, Kep and Sihanoukville), the CCCA National Programme Director (NPD) (or his alternate) and a representative from UNEP. The PSC will steer the project implementation process and any problems encountered will be discussed during the regular meetings (every six months throughout the project implementation with additional meetings held as and when necessary) and/or *ad hoc* sessions. The NPC will serve as the secretary of the PSC. The PSC will approve annual work plans and procurement plans, and review project periodical reports as well as any deviations from the approved plans. All decisions of the PSC, such as respective responsibilities, timelines and budget will be clearly communicated to the parties concerned. PSC members will facilitate the implementation of the project activities in their respective agencies, ensure that activities are implemented in a timely manner and facilitate the integration of project-inspired activities into existing programmes and practices. Additionally, the PSC will receive guidance from the PSB regarding funding and implementation. In the event that changes to the project's Results Framework (see Appendix 4), which will impact on the delivery of project outcomes, are required, UNEP and the CCCA PSB must be advised. Similarly, if implementation progress is such that the project outcomes are unlikely to be delivered then UNEP and the CCCA PSB must be advised well in advance.

187. Close linkages and coordination meetings on a quarterly basis or when required will be undertaken between the project and both the CCCA Support Programme (see Appendix 20) and the on-going UNDP-GEF Project "Climate resilient water management and agricultural practices" (see Section 2.8), which is implementing activities similar to those in the project, but in other geographical areas. These meetings will involve the relevant coordinators and advisors to ensure effective coordination and avoidance of effort duplication. Additionally, a project managers' coordination working group will be established comprising managers from the other ongoing projects/programmes detailed in the Linkages Section (Section 2.8) in order to coordinate efforts and avoid overlap between similar endeavors. It is anticipated that the working group will meet on an annual basis during project implementation.

SECTION 5: STAKEHOLDER PARTICIPATION

188. Stakeholder participation is at the root of the implementation strategy for the project. At the community level, stakeholder participation will be ensured through the involvement of and provision of support to the FWUCs and Commune Councils. Representatives of major NGOs or associations will be invited to participate in decentralized committees or working groups, as appropriate.

Outcome	Output	Lead Institution	Key Partners	Key responsibilities
Outcome 1:	Output 1.1: Systems	MoE	MAFF, MoWRAM,	Overseeing the

[124] Alternatively, the Governors may instead elect to include their Deputy or Provincial Secretary on the PSC.

Institutional capacity to assess climate change risks and integrate them into national development policies strengthened.	and processes for identification and implementation of adaptation measures.		MLMUPC	functioning of the data network. Organising and conducting the training courses.
	Output 1.2: Climate change risks are incorporated into national development plans and policy.	MoE	MAFF, MoWRAM, MLMUPC	Organising of study trip. Identifying appropriate climate models.
	Output 1.3: Relevant government departments are trained on climate change risks and adaptation within the coastal zone.	MoE	MAFF, MoWRAM, MLMUPC	Organising and conducting the training exercises. Presenting the adaptation plan to NCCC members.
	Output 1.4: Indicators for monitoring climate change impacts and assessing risks in the coastal zone in place.	MoE	MAFF, MoWRAM, MLMUPC, provincial departments	Training technical staff on the climate change indicators. Conducting workshops regarding the indicators. Developing the long-term monitoring plan.
Outcome 2: Adaptation planning in the coastal zone improved.	Output 2.1: Vulnerability maps for sensitive ecosystems and infrastructure within the coastal zone.	MoE	MAFF, MoWRAM, MLMUPC, MPWT, MRD, NCDM	Assessing options for early warning systems. Developing the vulnerability report. Preparing the vulnerability maps.
	Output 2.2: Relevant provincial- and district-level stakeholders are trained on climate-proofing development and adaptation planning within the coastal zone.	MoE	PDE, PDA, FiA, PDLMUPC, PDWRAM,	Conducting and organizing training and capacity-building workshops. Developing the local-level adaptation plan.
Outcome 3: Vulnerability of productive systems to increased floods reduced.	Output 3.1: Coastal communities use agricultural practices protected from changing climatic conditions and livelihoods are improved.	MAFF	PDE, PDA, PDLMUPC, PDWRAM, Commune Councils, FWUCs, NGOs	Developing relevant guidance material. Conducting meetings with NGOs. Reviewing the vulnerability of existing agricultural practices.

Outcome 4: Resilience of coastal buffers to climate change increased and livelihoods improved.	Output 4.1: Ecosystem-based coastal protection through mangrove system restoration.	MoE	PDE, PDFiA, PDLMUPC, PDWRAM, Commune Councils,	Overseeing the implementation of activities. Establishing the management committees.
	Output 4.2: Increased awareness on the importance of mangrove system restoration.	MoE	PDE, PDFiA, PDLMUPC, PDWRAM, Commune Councils,	Overseeing the development of policy briefs. Organising meetings with Commune Councils.

SECTION 6: MONITORING AND EVALUATION PLAN

189. The project will be monitored through the M&E activities described below and in accordance with the budget presented in Appendix 1.

190. The project will comply with formal guidelines, protocols and toolkits issued by GEF, UNEP, the RGC and the Global Support Unit of the LDCF Portfolio Project. Actual project M&E will be conducted in accordance with established UNEP and GEF procedures for MSPs under the LDCF Portfolio Project as outlined in the M&E Tool Kit. The Tool Kit is designed to simplify design and implementation of M&E for projects within the LDCF portfolio and presents carefully selected compulsory and optional indicators for measuring impact and performance. These indicators are contained in the project's Results Framework (see Appendix 4) for each expected output as well as mid-term and end-of-project targets and will be the main tools for assessing project implementation progress and whether results are being achieved. The means of verification are also included in the Results Framework. M&E-related costs are included in the project budget. The Tool Kit does not cover monitoring of detailed project administration such as quarterly reports, input monitoring or the preparation and monitoring of quarterly work plans, which are covered by existing UNEP guidelines. The NPC will submit quarterly narrative and financial reports to UNEP and the CCCA national Programme Coordinator, who will include them in the overall progress reporting of the CCCA for the CCCA donors.

191. The M&E plan will be reviewed and revised as necessary during the project inception phase to ensure that stakeholders understand their roles and responsibilities. Day-to-day project monitoring is the responsibility of the NPC and his/her team but other partners will have responsibilities to collect specific information to track the indicators. It is also the responsibility of the NPC to inform UNEP and the PSC of any delays or difficulties faced during implementation so that the appropriate support or corrective measures can be adopted in a timely fashion.

192. The project will be reviewed annually as part of a **Joint Programme Review**, preferably to take place by the end of each fiscal year at a mutually agreed upon time. The purpose of the Joint Programme Review is to assess progress and ensure that the project remains focused and in line with the overall CCCA programme agreement between the Government and the Development Partners.

193. A **Project Inception Workshop** will be held within the first 2 months of the start of project and will involve those with assigned roles in the project management structure (see Figure 9), UNEP representatives and where appropriate/feasible regional technical policy and programme advisors as well as other stakeholders. The Annual Work Plan (AWP), with a detailed M&E Strategy, will be agreed on at the Inception Workshop. The Inception Workshop Report should be prepared no more than 1 month after the Inception Workshop.

194. UNEP will develop a **Supervision Plan** during the project's inception phase that will be distributed and presented to all stakeholders during the Inception Workshop. The emphasis of the Supervision Plan will be on outcome monitoring, learning and sustainability, but without neglecting financial management and implementation monitoring. Project risks and assumptions will be regularly monitored by UNEP. Key financial parameters will be monitored annually to ensure the cost-effective use of financial resources.

195. The project will undergo an independent **Mid-Term Evaluation** at the mid-point of project implementation. The Mid-Term Evaluation will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, ToR and timing of the Mid-Term Evaluation will be decided after consultation between the parties to the project document. The relevant GEF Focal Area Tracking Tools will also be completed during the Mid-Term Evaluation cycle.

196. An independent **Final Evaluation** will take place three months prior to the project end date in accordance with UNEP and GEF guidance. The Final Evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the Mid-Term Evaluation, if any such correction took place). The Final Evaluation will assess the impact and sustainability of results, including their contribution to capacity development and the achievement of adaptation benefits. The Final Evaluation should also provide recommendations for follow-up activities and requires a management response which should be uploaded onto PIMS.

197. A key **Annual Project Review/Project Implementation Review** (PIR) will be prepared to monitor progress made since the project's start and in particular for the previous reporting period. The PIR includes, but is not limited to, reporting on the following:

- Progress made toward the project's objective and outcomes - each with indicators, baseline data and end-of-project targets (cumulative).
- Project outputs delivered per project outcome (annual).
- Lesson learned/good practice.
- AWP and other expenditure reports.
- Project risks and adaptive management.

198. Periodic monitoring will be conducted through visits to the demonstration sites undertaken by relevant staff from UNEP and the PSC/PSB. Visits will be jointly conducted based on the agreed schedule to assess project progress first hand.

Auditing Procedures

199. An annual audit of the project will be conducted by an external auditor. The audit will be carried out during the first quarter of each year. The NPC will ensure that all queries raised by the auditors during and after the audit are responded to, to the satisfaction of the auditors. Similarly, the NPC will make all project-related technical and substantive reports available to the auditors.

SECTION 7: PROJECT FINANCING AND BUDGET

7.1. Overall project budget

200. The total budget for this project is **US$ 5,993,500.**

Table 5. A breakdown of total project financing.

	LDCF Funds	**Co-Financing**	**Total cost**
Total project cost($)	1,798,500	4,195,000	5,993,500

7.2. Project co-financing

201. Co-financing will be provided by the following partners, as per the attached co-financing letters (see Appendix 12):

Table 6. A total breakdown of project financing.

Cost to the LDCF	**1,798,500**	**30**
Co-financing		
Cash		
CCCA	**2,200,000**	**36.7**
MoWRAM	**1,400,000**	**23.4**
MAFF	**400,000**	**6.7**
Sub-total	*4,000,000*	*66.74*
In-kind		
MoE	**195,000**	**3.2**
Sub-total	*195,000*	*3.2*
Total	**5,993,500**	**100**

202. MoWRAM's project (number P.90) 'Rehabilitation of Prey Nup Reservoir' will serve as baseline co-financing for the project, as will MAFF's project (number 1D) 'Forestry reforms- Proper Management of Mangrove Forest Resources'.

7.3. Project cost-effectiveness

203. Cost information was determined for the on-the-ground adaptation measures identified following the analyses undertaken during the PPG Phase and, based on this, the activities were deemed cost-effective (details included in Appendix 18 and the budget notes within Appendix 1). The effectiveness of these activities in increasing resilience to climate change will be tested and measured during the course of the project. This will involve undertaking an economic analysis and performing cost-benefit analyses to ascertain whether each activity is an economically viable option given climate change. The most successful activities will be prioritised for upscaling to neighbouring communes/districts and provinces within the coastal zone and details regarding their implementation will be disseminated widely at the workshops/training events undertaken by the project.

204. Additionally, the project will ensure a cost-effective approach by building upon the last decade of work undertaken within the Cambodian coastal zone and specifically, by building upon the capacity that was developed as a result of this work. Lessons will also be taken from previous work within the coastal zone (for example from the Danida project, see Section 2.7) to follow successful methods and avoid pitfalls. Furthermore, building the project management structures on existing institutional

structures (e.g. the CCU) as well as linking the project site-by-side with the CCCA demonstrates the cost-effectiveness of the project set up.

205. The technical and financial support provided to the Commune Councils and FWUCs to act as management communities, which is an integral component of the proposed adaptation measures, will ensure capacity and ownership is developed within the communities. This will ensure cost-effectiveness in terms of monitoring, operating and maintaining of the activities and will thus enhance sustainability beyond the project lifespan.

206. The approach taken for the development of this project has also sought to build on linkages with and incorporate climate change considerations into national policies and strategies, which is expected to generate multiple benefits nationally. Each of the four outcomes is expected to build on the activities, outputs and outcomes of the others: for example, the long-term sustainability of the on-the-ground adaptation measures (i.e. protecting agricultural systems and improving natural coastal buffer systems) (Outcomes 3 and 4) will be supported by both the project's capacity building efforts (Outcome 1) and the detailed adaptation planning conducted by the project (Outcome 2). By linking the outcomes in this way, the project presents the least costly means of achieving rapid benefits.

207. Furthermore, Outcome 1 will ensure that climate change and adaptation considerations are integrated into relevant national and coastal development plans and policies and are therefore replicated and sustained through the implementation of those policies, which will also contribute to cost-effectiveness of the project.

208. Project cost-effectiveness of the on-the-ground adaptation measures will also be ensured through the identification and introduction of effective alternative livelihoods for vulnerable communities, which will reduce the pressure placed on natural coastal buffering systems, such as mangrove forests.

APPENDICES

Appendix 1: Budget by project components and UNEP budget lines and budget notes

Project number:														
Project executing partner:			Ministry of Environment											
Project implementation period:														
From:	Jan-11													
To:	Dec-14		Expenditure by project component/activity											
										Expenditure by calendar year				
UNEP Budget Line			Outcome 1	Outcome 2	Outcome 3	Outcome 4	Project Management	M&E	**Total**	Year 1	Year 2	Year 3	Year 4	**Total**
10	**PERSONNEL COMPONENT**													
	1100	Project personnel												
		1101 Assistant coordinator					16,800		**16,800**	4,200	4,200	4,200	4,200	**16,800**
		1102 Administration/ finance assistant (portion)					5,200		**5,200**			2,400	2,800	**5,200**
	1199	**Sub-total**	**0**	**0**	**0**	**0**	**22,000**	**0**	**22,000**	**4,200**	**4,200**	**6,600**	**7,000**	**22,000**
	1200	Consultants												
		1201 Senior Technical Advisor	132,000	74,750			75,000		**281,750**	151,750	44,000	55,000	31,000	**281,750**
		1202 International climate change adaptation specialist	47,450	29,200	18,250				**94,900**	47,450	21,900	14,600	10,950	**94,900**
		1203 International policy expert	10,950						**10,950**	10,950				**10,950**
		1204 International climate change modeler	40,150	14,600					**54,750**	14,600	25,550	14,600		**54,750**

1205	International water resources modeler	29,200			**29,200**		29,200			**29,200**
1206	International oceanographer	18,250			**18,250**		18,250			**18,250**
1207	International land use/spatial planner		36,500		**36,500**	18,250	18,250			**36,500**
1208	Local climate change expert	9,000	15,000		**24,000**	8,000	6,000	6,000	4,000	**24,000**
1209	Local GIS expert	6,000			**6,000**		6,000			**6,000**
1210	Local socio-economist	6,000	9,000	9,000	**24,000**	8,000	6,000	6,000	4,000	**24,000**
1211	Local natural resources specialist	3,000			**3,000**		3,000			**3,000**
1212	Local environmental specialist	3,000			**3,000**		3,000			**3,000**
1213	Local workshop facilitator	3,000			**3,000**		1,500	1,500		**3,000**
1214	Local land use/spatial planner		21,000		**21,000**		12,000	9,000		**21,000**
1215	International Shoreline management expert		14,600		**14,600**		7,300	7,300		**14,600**
1216	Local water resources expert		15,000		**15,000**	3,000	6,000	3,000	3,000	**15,000**
1217	Local agriculture expert		15,000	6,000	**21,000**	6,000	6,000	6,000	3,000	**21,000**
1218	Local forestry/ mangroves expert		18,000		**18,000**	3,000	6,000	3,000	6,000	**18,000**

		1219	Local infrastructure expert		3,000					**3,000**			3,000		**3,000**
		1220	Local cartographic expert		6,000					**6,000**		3,000	3,000		**6,000**
		1221	Local anthropologist		6,000					**6,000**	3,000	3,000			**6,000**
		1222	Local meteorologist		6,000					**6,000**	3,000		3,000		**6,000**
		1223	International ecosystems services expert				21,900			**21,900**		10,950		10,950	**21,900**
		1224	International livelihoods specialist				36,500			**36,500**		10,950	14,600	10,950	**36,500**
		1225	Local policy expert				9,000			**9,000**			3,000	6,000	**9,000**
		1226	International M&E expert						20,440	**20,440**		10,950		9,490	**20,440**
		1227	Local M&E expert						6,000	**6,000**		3,000		3,000	**6,000**
	1299		**Sub-total**	308,000	283,650	33,250	67,400	75,000	26,440	793,740	277,000	261,800	152,600	102,340	793,740
		1601	Travel for project management					20,440		**20,440**	5,200	5,100	5,000	5,140	**20,440**
	1602		Travel on official business	62,100	57,400	11,600	26,800			**157,900**	45,600	31,100	32,500	48,700	**157,900**
	1699		**Sub-total**	62,100	57,400	11,600	26,800	20,440	0	**178,340**	50,800	36,200	37,500	53,840	**178,340**
1999	**Component total**			370,100	341,050	44,850	94,200	117,440	26,440	**994,080**	**332,000**	**302,200**	**196,700**	**163,180**	**994,080**
20	**SUB-CONTRACT COMPONENT**														
	2200		Sub-contracts (MoUs/LoAs for supporting organisations)												

		2201	MoU/LoA with MAFF, MoWRAM, MLMUPC			18,000	18,000			**36,000**			**18,000**	**18,000**	**36,000**
		2199	**Sub-total**	**0**	**0**	**18,000**	**18,000**	**0**	**0**	**36,000**			**18,000**	**18,000**	**36,000**
30	**TRAINING COMPONENT**														
	3200		Group training												
		3201	Training needs assessment	3,000						**3,000**	3,000				**3,000**
		3202	Climate change adaptation training (including preparation of training courses)	15,000						**15,000**	7,500	7,500			**15,000**
		3203	Training exercises	38,000			4,000			**42,000**	30,000	12,000			**42,000**
		3299	**Sub-total**	**56,000**	**0**	**0**	**4,000**	**0**	**0**	**60,000**	**40,500**	**19,500**			**60,000**
	3300		Meetings/ conferences												
		3301	Workshops	31,000	22,600		20,000			**73,600**	28,000	17,600		28,000	**73,600**
		3302	Inception Workshop						7,000	**7,000**	7,000				**7,000**
	3399		**Sub-total**	**31,000**	**22,600**	**0**	**20,000**	**0**	**7,000**	**80,600**	**35,000**	**17,600**		**28,000**	**80,600**
3999	**Component total**			**87,000**	**22,600**	**18,000**	**42,000**	**0**	**7,000**	**176,600**	**75,500**	**37,100**	**18,000**	**46,000**	**176,600**
50	**MISCELLANEOUS COMPONENT**														
	5200		Reporting costs												
		5201	Drafting of policy revisions	8,000						**8,000**	8,000				**8,000**
		5202	Printing, laminating, binding etc	14,800	28,100		8,450			**51,350**	20,500	12,800	6,000	12,050	**51,350**
		5203	Inception Workshop Report						3,000	**3,000**	3,000				**3,000**

	5204	Lessons learned report	2,500	2,500	2,500	2,500			**10,000**				10,000	**10,000**
5299		**Sub-total**	25,300	30,600	2,500	10,950		3,000	**72,350**	**31,500**	**12,800**	**6,000**	**22,050**	**72,350**
5300		Sundry												
	5301	General office supplies	16,000	6,500					**22,500**	17,000	2,000	3,500		**22,500**
	5302	Deepening the natural lake			101,250				**101,250**		42,250	41,000	18,000	**101,250**
	5303	Constructing a dike			157,500				**157,500**			79,400	78,100	**157,500**
	5304	Planting *Teap trus* tree to stabilise dikes			12,180				**12,180**		12,180			**12,180**
	5305	Providing rainwater harvesting tanks			15,000				**15,000**		15,000			**15,000**
	5306	Planting trees for stabilising Peam Krasaop beach				3,248			**3,248**		3,248			**3,248**
	5307	Undertaking mangrove restoration				74,700			**74,700**		56,900	17,800		**74,700**
	5308	Equipment and supplies for piloting alternative livelihoods			45,824	48,268			**94,092**		43,500	34,400	16,192	**94,092**
5399		**Sub-total**	16,000	6,500	331,754	126,216	0	0	**480,470**	**17,000**	**175,078**	**176,100**	**112,292**	**480,470**
5500		Evaluation												
	5501	Audits						10,000	**10,000**	2,500	2,500	2,500	2,500	**10,000**
	5581	Mid-term evaluation						30,000	**30,000**		15,000	15,000		**30,000**
	5582	Final evaluation						35,000	**35,000**				35,000	**35,000**
5499		**Sub-total**						65,000	**65,000**	**0**	**15,000**	**15,000**	**35,000**	**65,000**

5999	**Component total**	**41,300**	**37,100**	**334,254**	**137,166**	**0**	**68,000**	**617,820**	**48,500**	**202,878**	**197,100**	**169,342**	**617,820**
99	**GRAND TOTAL**	**498,400**	**400,750**	**397,104**	**273,366**	**117,440**	**101,440**	**1,788,500**	**456,000**	**542,178**	**411,800**	**378,522**	**1,788,500**

Outcome 1: Institutional capacity to design and implement climate change demonstration activities increased and strengthened.
STA costs are being shared between CCCA and LDCF funds. CCCA funds will cover STA costs for Outcomes 3 and 4 and for part of project management STA costs. Overall, the costs of the STA have been spread across the outputs and project management. Within Year 1, the STA will work full-time. During Year 2, the STA will work 60% of the time and during Years 3 and 4 the STA will work for approximately 30% of the time. By gradually reducing the STA support, the project will strengthen in-country capacity. This process is likely to be successful as a result of the existing capacity within the CCU. LDCF funds will be allocated towards the STA as follows: $151,750 in Year 1, $44000 in Year 2, $55000 in Year 3 and $31,000 in Year 4. STA costs for Outcome 1 will be $132,000.
Outcome 1 requires 5 International Consultants (ICs), namely: i) a climate change adaptation consultant to provide technical assistance on the training to be undertaken (which will include training on assessing climate change impacts, sensitivity, exposure, trends and vulnerability, risk analysis and risk assessment, and funding for adaptation measures including an analysis of the climate change analytical tools, methodologies, software available for identification and implementation of adaptation measures) as well as on the development of the adaptation methodology and to assist with the capturing of the project's lessons learned for the awareness raising workshops and who will also will be contracted to assist in the development of climate change-related indicators for the coastal zone (86 days at a rate of $550/day, i.e. a total of $47,450); ii) a policy expert to work closely with the National Consultants (NCs) to identify existing policy gaps relating to the coastal zone (and specifically the lack of consideration for climate change impacts and adaptation) and draft suggested revisions to national policy documents in order to increase the efficiency of climate risk reduction in the coastal zone (20 days at a rate of $550/day, i.e. total of $10,950); iii) a climate change modeler to undertake climate scenario modeling of climate change impacts on the coastal zone, in collaboration with the contractual services hired (73 days at a rate of $550/day, i.e. a total of $40,150); iv) a Water Resources Modeler to model the impacts climate change is likely to have on water resources within the coastal zone (53 days at a rate of $550/day, i.e. a total of $29,200); and v) an oceanographer to model climate change impacts on oceanic variables (33 days at a rate of $550/day, i.e. a total of $18,250).
Six National Consultants (NCs) will be contracted to undertake the activities within Outcome 2, namely: i) a climate change expert (3 months at a rate of $3000/month, i.e. a total of $9000); ii) a GIS expert (2 months, $6000); iii) a socio-economist (2 months, $6000); iv) a natural resources specialist (1 month, $3000); v) an environmental specialist (1 month, $3000); and vi) a workshop facilitator (1 month, $3000). The NCs will work closely with the IC to collect relevant data and identify climate change indicators relevant for Cambodia's coastal zone, apart from the workshop facilitator who will head the proceedings of the workshops with key stakeholders to develop and raise interest regarding the indicators as well as the climate change adaptation national-level workshop.
Funds have been earmarked for undertaking training needs assessments ($3,000) and undertaking training exercises ($53,000). Training exercises will involve training on: i) climate change adaptation for relevant agencies at the national and provincial level; ii) the results of the climate change modeling exercises; iii) the lessons learned through the implementation of the demonstration activities; iv) measuring and analysing climate change indicators; and v) incorporating climate change considerations in the Commune and District Development Plans. Funds have also been earmarked to conduct the following workshops: i) workshops with key stakeholders to develop and raise awareness regarding the climate change indicators developed; ii) workshops with coastal stakeholders and leaders regarding lessons learned through the implementation of demonstration activities; and iii) workshops with national-level leaders and stakeholders and leaders regarding lessons learned through the implementation of demonstration activities. The total cost for workshops is estimated at $31,000. Workshop and training-related costs will include the costs of hiring of venues and catering.
Funds are earmarked for workshop-related travel and the travel costs of the ICs and NCs as well as daily allowances. This will include organising transport (e.g. buses) for participants from the coastal provinces for the training exercises conducted within each province. It also includes travel of the NCs between Phnom Penh and the coast, which will entail the hiring of cars and drivers (estimated to cost $120/day per car). Additionally, the travel costs of the IC will need to be covered, which includes both travel between Phnom Penh and the coast, travel within Phnom Penh and travel between Phnom Penh and the IC's country of residence. Additionally, these funds will be allocated towards the study trip to a nearby country with experience in dynamic systems modeling.

Printing and reporting expenses will cover printing costs of all training - and workshop-related materials which will need to printed, bound and disseminated to all participants. This will also included graphs similar to those already included in the State of Coastal Environment Report describing the indicators as well as the costs of printing of the reports detailing the indicators for inclusion into the State of the Coastal Environment report. These materials and reports are likely to be printed in colour due to the nature of the indicators (e.g. different colours represent the extent of the relevant indicator in each commune/district/province).
Supplies required for the activities within Outcome 1 will include items such as stationery (including a resource pack for workshop participants including pen, notepad, folder etc as well as stationery for the project implementation team), reference books required and general office supplies. Funds are also earmarked for the purchase of high resolution satellite images for GIS analysis.
Outcome 2: Adaptation planning in the coastal zone improved.
STA costs are being shared between CCCA and LDCF funds. CCCA funds will cover STA costs for Outcomes 3 and 4 and for part of project management STA costs. Overall, the costs of the STA have been spread across the outputs and project management. Within Year 1, the STA will work full-time. During Year 2, the STA will work 60% of the time and during Years 3 and 4 the STA will work for approximately 30% of the time. By gradually reducing the STA support, the project will strengthen in-country capacity. This process is likely to be successful as a result of the existing capacity within the CCU. LDCF funds will be allocated towards the STA as follows: $151,750 in Year 1, $44000 in Year 2, $55000 in Year 3 and $31,000 in Year 4. STA costs for Outcome 2 will be $74,750.
Four ICs will be contracted to undertake the work required for Outcome 2, namely: i) a shoreline management expert to provide land use planning and advice relevant to vulnerable areas along the coast (27 days, $14,600) and who will work with the STA to identify particularly vulnerable sites and sensitive communities and to further clarify the extent of climate change impacts on the coastal zone; ii) a land use/spatial planning expert to develop detailed coastal vulnerability maps and to provide advice regarding the development of the adaptation plans (66 days, $36,500); iii) a climate change adaptation specialist (53 days, $29,200) to undertake the training of national- and provincial-level staff required regarding climate change considerations in the coastal zone as well as assist in the capacity building exercises related to climate risk assessments and analyses and to develop the coastal adaptation plans in collaboration with CCD, MoE and other key departments; and iv) a climate change modeler (27 days, $14,600) to undertake capacity building exercises related to the interpretation of climate modeling and impact modeling results and to also provide input related to the development of the coastal adaptation plans.
Ten NCs will be contracted to assist the ICs in undertaking the work required by Outcome 2, namely: i) a water resources expert (5 months, $15,000); ii) an agriculture expert (5 months, $15,000); iii) a forestry/mangrove expert (6 months, $18,000); iv) an infrastructure expert (1 month, $3,000); v) a socio-economist (3 months, $9,000); vi) a climate change expert (5 months, $15,000); vii) a meteorologist (2 months, $6,000), who will work closely with the abovementioned NCs and with the ICs and the STA to undertake investigations into vulnerability to climate change impacts along the coastal zone and to assist in the identification of additional demonstration adaptation activities; viii) a cartographic expert to assist in the development of vulnerability maps for the coastal zone (2 months, $6,000); ix) a land use/spatial planner (7 months, $21,000); and x) an anthropologist (2 months, $6,000) who will (with the land use/spatial planner) be contracted to work closely with the STA and the IC to develop detailed coastal vulnerability maps (including working closely with community members to gather their input) and to provide advice regarding the development of the adaptation plans.
Funds are earmarked for workshop-related travel and the travel costs of the ICs and NCs as well as daily allowances. This will include travel of the NCs between Phnom Penh and the coast, which will entail the hiring of cars and drivers (estimated to cost $120/day per car). Additionally, the travel costs of the IC will need to be covered, which includes both travel between Phnom Penh and the coast, travel within Phnom Penh and travel between Phnom Penh and the IC's country of residence. Workshop-related travel will include the hiring of busses and drivers to transport workshop participants to the workshop venue.

Printing and reporting costs will cover printing costs of all workshop-related materials; printing, laminating and distributing of the detailed vulnerability maps (in colour); and printing of the adaptation plans developed. At least 100 adaptation plans and vulnerability maps will be printed for distribution to all stakeholders (including at the commune, district, provincial and national levels). Additionally, these costs will cover the results of the vulnerability investigations and assessments, which will need to be published in a report for distribution to workshop participants and other stakeholders.
Funds have been earmarked for the training and capacity-building workshops to be held with provincial- and district-level government staff related to appropriate, climate-resilient zoning and land use planning. At least one three-day workshop will be held with representatives from all four coastal provinces, including representatives from the Commune/District Councils from Districts close to the coast. Costs will involve venue hire and catering.
Supplies required for the activities within Outcome 1 will include items such as stationery (including a resource pack for workshop participants including pen, notepad, folder etc as well as stationery for the project implementation team), reference books required and general office supplies. Funds are also earmarked for the purchase of high resolution satellite images for the topographic analyses.
Outcome 3: Vulnerability of productive systems to increased floods reduced.
Although CCCA funds will be allocated predominantly towards demonstration activities, LDCF funds will be allocated towards certain of the demonstration activities identified based on a rapid assessment undertaken during the PPG Phase. Importantly, these activities are flexible and are likely to be fine-tuned based on the results undertaken by the project and after careful consideration of the projects included in the Commune Development Plans. Costing information is as follows: i) deepening the natural lake ($2/m3 for 50,625$m^3$, total of $101,250); ii) constructing a dyke ($17,500/km over 9 km, a total of $157,500); iii) planting teap trus trees to stabilise dykes ($812/ha over 15 ha, total of $12,180); and iv) providing rainwater harvesting tanks ($750 each, providing 20, total of $15,000) to improve access to fresh drinking water in areas threatened by increasing SLR and saline intrusion. Details regarding these activities are included in Appendix 18. Additionally, $29,506 will be allocated towards identifying and piloting alternative livelihoods for farmers within the demonstration site to improve their income stream and offset any losses in agricultural production as a result of climate change impacts.
An international climate change adaptation expert (33 days, $18,250) will be contracted to work closely with the NCs to determine the cost-effectiveness of each demonstration activity through the conduction of an economic analysis and cost-benefit analyses.
Two NCs (namely a local socio-economist: 3 months, $9000 and an agriculture expert: 2 months, $6000) will be contracted to work closely with the IC to ascertain the cost-effectiveness and potential for up-scaling of the demonstration activities.
Funds are earmarked for workshop-related travel and the travel costs of the ICs and NCs as well as daily allowances. It also includes travel of the NCs between Phnom Penh and the coast, which will entail the hiring of cars and drivers (estimated to cost $120/day per car). Additionally, the travel costs of the IC will need to be covered, which includes both travel between Phnom Penh and the coast, travel within Phnom Penh and travel between Phnom Penh and the IC's country of residence. Additionally, funds will cover the cost of hiring a car and driver for the consultants to visit demonstration sites.
Outcome 4: Resilience of coastal buffers to climate change increased and livelihoods improved.
Two ICs will be employed to assist in implementing the project's demonstration activities, namely: i) an ecosystem services expert to assist in determining the value of ecosystem services from intact mangrove forests and the costs of damaging the mangroves (40 days, $21,900); and ii) a livelihoods expert to conduct assessments to determine the costs and benefits of particular alternative livelihood options (66 days, $21,900).
One NC will be contracted to develop policy briefs and guidelines for local application based on the assessments undertaken as part of Output 4.2 (3 months, $9000).

Funds are earmarked for workshop-related travel and the travel costs of the ICs and NCs as well as daily allowances. It also includes travel of the NCs between Phnom Penh and the coast, which will entail the hiring of cars and drivers (estimated to cost $120/day per car). Additionally, the travel costs of the IC will need to be covered, which includes both travel between Phnom Penh and the coast, travel within Phnom Penh and travel between Phnom Penh and the IC's country of residence. Additionally, funds will cover the cost of hiring a car and driver for the consultants to visit demonstration sites.
Demonstration activities to be funded by LDCF-GEF were identified based on a rapid assessment undertaken during the PPG Phase. Importantly, these activities are flexible and are likely to be fine-tuned based on the results undertaken by the project and after careful consideration of the projects included in the Commune Development Plans. Costing information is as follows: i) stabilising sand on Peam Krasaop beach by planting trees ($812/ha over 4 ha, total of $3248); and ii) replanting 90 ha of mangroves ($830/ha over 90 ha, total of $74,700). Details regarding these activities are included in Appendix 18. Additionally, $31,950 will be allocated towards identifying and piloting alternative livelihoods to reduce the dependence of vulnerable communities on natural ecosystems, such as the mangrove forests.
Commune Councils will be trained to manage the demonstration activities undertaken through Outcome 4. This training will cost $4,000.
A workshop will be undertaken in each of the four coastal provinces comprising representatives (or entire) of the coastal Commune or District Councils to inform them of the results of the assessments performed on the costs and benefits related to intact mangrove forests and degraded mangroves as well as the results of the assessments performed on particular alternative livelihoods. In total, each workshop will cost $5,000, i.e. a total of $20,000. Workshop-related costs will include venue hire and catering costs.
Funds are also earmarked for the development, printing and binding of policy briefs and guidelines for local application based on the outcome of the socio-economic assessments undertaken through Output 4.2. Importantly, these briefs and guidelines will be developed in both Khmer and English.

Appendix 2: Co-financing by source and UNEP budget lines

Co-financing amounts will be allocated as set out in the co-financing table below:

APPENDIX 2 - RECONCILIATION BETWEEN GEF BUDGET AND CO-FINANCE BUDGET (TOTAL GEF & CO-FINANCE US$)

Project number:

Project executing partner: MoE

Project implementation period:

		From: 01 March 2011 To: 31 December 2015	LDCF Cash	CCCA[125] Cash	MoE[126] In-kind	MAFF[127] Parallel	MoWRAM[128] Parallel	Cash (F)	Total In-kind (G)	Parallel (H)	**Total (F+G+H)**
UNEP Budget Line			A	B	C	D	E	A+B	C	D+E	
10	**PERSONNEL COMPONENT**										
	1100	Project personnel									
	1101	Assistant Coordinator	16,800					16,800			16,800
	1102	Finance/Admin assistant	5,200	12,800				18,000			18,000
	1103	National Project Coordinator		21,600				21,600			21,600
	1104	Sub-national project staff		10,600				10,600			10,600
	1199	**Sub-total**	**22,000**	**45,000**				**67,000**			**67,000**
	1200	Consultants									
	1201	STA	281,750	246,500				528,250			528,250
	1202	International climate change adaptation expert	94,900					94,900			94,900
	1203	Local coastal resources specialist		12,000				12,000			12,000
	1203	International policy expert	10,950					10,950			10,950
	1204	International climate change modeler	54,750					54,750			54,750
	1205	International livelihoods specialist		43,800				43,800			43,800
	1205	International water resources modeler	29,200					29,200			29,200
	1206	International oceanographer	18,250					18,250			18,250
	1207	International spatial/Land use planner	36,500	65,700				102,200			102,200
	1207	International monitoring expert		21,900				21,900			21,900
	1208	Local dike specialist		9,000				9,000			9,000

[125] CCCA is considered as "adaptation co-financing"
[126] MoE is considered as "baseline co-financing "
[127] MAFF is considered as "baseline co-financing"
[128] MoWRAM is considered as "baseline co-financing"

	1208	Local climate change expert	24,000		24,000	24,000
	1209	Local GIS expert	6,000		6,000	6,000
	1210	Local forestry/mangrove specialist		15,000	15,000	15,000
	1210	Local socio-economist	24,000	12,000	36,000	36,000
	1211	Local natural resources specialist	3,000		3,000	3,000
	1212	Local livelihoods specialist		45,000	45,000	45,000
	1212	Local environmental specialist	3,000		3,000	3,000
	1213	Local integrated farming specialist		30,000	30,000	30,000
	1213	Local workshop facilitator	3,000		3,000	3,000
	1214	Local land use planner	21,000	18,000	39,000	39,000
	1215	International Shoreline management expert	14,600		14,600	14,600
	1216	Local water resources/irrigation specialist	15,000	15,000	30,000	30,000
	1217	International water/agriculture specialist	21,000	51,700	72,700	72,700
	1218	International mangrove/forestry specialist	18,000	65,700	83,700	83,700
	1219	Local infrastructure expert	3,000		3,000	3,000
	1220	Local cartographic expert	6,000		6,000	6,000
	1221	Local anthropologist	6,000		6,000	6,000
	1222	Local meteorologist	6,000		6,000	6,000
	1223	International ecosystems services expert	21,900		21,900	21,900
	1224	International livelihoods specialist	36,500		36,500	36,500
	1225	Local policy expert	9,000		9,000	9,000
	1226	International M&E Expert	20,440		20,440	20,440
	1227	Local M&E expert	6,000		6,000	6,000
	1299	**Sub-total**	**793,740**	**651,300**	**1,445,040**	**1,445,040**
	1600	Travel				
	1601	Travel for project management	20,440	30,000	50,440	50,440
	1602	Travel on official business	157,900	95,000	252,900	252,900
	1699	**Sub-total**	**178,340**	**125,000**	303,340	303,340
1999	**Component total**		**994,080**	**821,300**	**1,815,380**	**1,815,380**

20	**SUB-CONTRACT COMPONENT**								
	2200	Sub-contracts (for cooperating agencies)							
	2201	MoU/LoA with MAFF, MoWRAM, MLMUPC	36,000				36,000		36,000
	2202	Implementation and monitoring of adaptation measures		36,000			36,000		36,000
	2203	Baseline co-financing			400,000	1,400,000		1,800,000	1,800,000
	2299	**Sub-total**	**36,000**	**36,000**	**400,000**	**1,400,000**	**72,000**	**1,800,000**	**1,872,000**
	2300	Sub-contracts (for commercial purposes)							
	2301	Contractual services (undertake coping strategies assessment and vulnerability and risk assessment)		55,000			55,000		55,000
	2399	**Sub-total**	**0**	**55,000**			**55,000**		55,000
2999	**Component total**		**36,000**	**91,000**	**400,000**	**1,400,000**	**127,000**		**127,000**
30	**TRAINING COMPONENT**								
	3200	Group training							
	3201	Training needs assessment	3,000				3,000		3,000
	3202	Climate change adaptation training (including preparation of training courses)	15,000				15,000		15,000
	3203	Training exercises	42,000				42,000		42,000
	3299	**Sub-total**	**60,000**				**60,000**		**60,000**
	3300	Meetings/Conferences							
	3301	Workshops	73,600	80,000			153,600		153,600
	3302	Inception Workshop	7,000				7,000		7,000
	3399	**Sub-total**	**80,600**	**80,000**			160,600		160,600
3999	**Component total**		**140,600**	**80,000**			**220,600**		**220,600**
40	**EQUIPMENT AND PREMISES COMPONENT**								
	4200	Non-expendable equipment							

	4201	Monitoring equipment (e.g. cameras, GPS equipment, laboratory equipment)		154,000		154,000		154,000
	4202	Vehicles		70,000		70,000		70,000
	4203	Office furniture		30,000		30,000		30,000
	4204	Communication equipment		10,000		10,000		10,000
	4205	Audio-visual equipment		30,000		30,000		30,000
	4206	Information technology (computers and related software)		45,000		45,000		45,000
	4299	**Sub-total**		**339,000**		**339,000**		**339,000**
	4300	Premises						
	4301	Office space			195,000		195,000	195,000
	4399	**Sub-total**			**195,000**		195,000	195,000
4999	**Component total**			**339,000**	**195,000**	**339,000**	**195,000**	**534,000**
50	**MISCELLANEOUS COMPONENT**							
	5200	Reporting costs						
	5201	Drafting of policy revisions	8,000			8,000		8,000
	5202	Printing, laminating, binding etc	51,350	45,700		97,050		97,050
	5203	Inception Workshop Report	3,000			3,000		3,000
	5204	Lessons learned report	10,000					
	5299	**Sub-total**	**72,350**	**45,700**		**118,050**		**118,050**
	5300	Sundry						
	5301	Phone and internet costs, electricity, petrol, insurance and general office supplies.	22,500	105,000		127,500		127,500
	5302	Deepening the natural lake	101,250			101,250		101,250
	5303	Constructing a dike	157,500			157,500		157,500
	5304	Funds allocated to adaptation measures		688,000		688,000		688,000
	5304	Planting *Teap trus* tree to stabilise dikes	12,180			12,180		12,180
	5305	Providing rainwater harvesting tanks	15,000			15,000		15,000
	5306	Planting trees for stabilising Peam Krasaop beach	3,248			3,248		3,248

	5307	Mangrove restoration costs	74,700					74,700			74,700
	5308	Equipment and supplies for piloting alternative livelihoods	94,092					94,092			94,092
	5399	**Sub-total**	**480,470**	**793,000**				**1,273,470**			**1,273,470**
	5500	Evaluation									
	5501	Audit	10,000	30,000				40,000			40,000
	5581	Mid-term evaluation	30,000					30,000			30,000
	5582	Final evaluation	35,000					35,000			35,000
	5599	**Sub-total**	**75,000**	**30,000**				**105,000**			**105,000**
5999	**Component total**		**627,820**	**868,700**				**1,496,520**			**1,496,520**
99	**GRAND TOTAL**		**1,798,500**	**2,200,000**	**195,000**	**400,000**	**1,400,000**	**3,998,500**	**195,000**	**1,800,000**	**5,993,500**

Appendix 3: Incremental cost analysis

The LDCF projects do not follow the incremental cost reasoning, but rather apply additional cost reasoning. See Section 3.7 (Additional Cost Reasoning) in the main document for details.

Appendix 4: Results Framework

	Indicator	Baseline	Targets	Source of verification	Risks and Assumptions
Project Objective: "to reduce the vulnerability of coastal communities to the impacts of climate change by strengthening policy and science, and demonstrating targeted local interventions to increase ecosystem resilience."	1. The percentage change in vulnerability of men and women living in the demonstration sites to climate change risks threatening the coastal zone.	1. The baseline will be determined in the demonstration sites in the inception phase through a VRA.	1a. Mid-way through the project, a 20% increase in the VRA score. 1b. By the end of the project, a 50% increase in the VRA score.	1. Gender-sensitive field surveys/VRA.	Assumption: Demonstration sites are best placed to demonstrate the benefits of measures to adapt to climate change. Assumption: Climate change concerns are not overshadowed by other emergency matters or urgent projects.
Outcome 1 Institutional capacity to assess climate change risks and integrate them into national development policies strengthened.	1. Number of government agencies participating in the data network (i.e. collecting and analysing climate-related data related to the coastal zone and disseminating results to the CCU). 2. Climate change risks determined for the coastal zone through modelling	1. A data network has not been established in Cambodia. 2. Climate change impacts and risks have not yet been modelled for the coastal zone in	1. At least 5 relevant government agencies participating in the network and disseminating climate-related analyses relevant to the coastal zone to the CCU. 2a. Mid-way through the project, summary reports and policy briefs regarding the results of modelling have been developed	1. Interviews with relevant government agencies and with the CCU. 2. Summary report and policy briefs developed regarding the modelling.	Assumption: Demonstration sites are best placed to demonstrate the benefits of measures to adapt to climate change. Assumption: Climate change concerns are not overshadowed by other emergency matters or urgent projects. Risk: Institutions do not allow for inter-institutional data sharing,

	of climate change impacts (yes/no).	Cambodia.	for Koh Kong and Sihanoukville provinces. 2b. By the end of the project, summary reports and policy briefs regarding the results of modelling have been developed for Kampot and Kep provinces.		planning and implementation of actions for climate change adaptation measures.
	3. Number of relevant national development plans and policies which include climate change considerations.	3. At present, climate change considerations (including adaptation) are largely absent from relevant national development plans and policy (although climate change is included in the updated NSDP) and emphasis is placed, rather, on post-disaster emergency relief.	3. By the end of the project, at least two national development plans/policies relevant to the coastal zone are revised to include climate change considerations.	3a. Revised documents. 3b. Interviews with agencies concerned.	
	4. Number of indicators for monitoring climate change impacts within the coastal zone developed.	4. At present, specific indicators to measure climate change indicators are not available.	4. By the end of the project, at least five indicators have been developed, measured and documented for the coastal zone.	4. The report developed detailing the indicators for inclusion in the 3rd State of the Environment Report.	
Outcome 2 Adaptation planning in the coastal zone improved.	1. Number of detailed vulnerability maps produced.	1. Vulnerability maps taking into account climate change risks are not presently available for the entire coastal zone (one was developed for Koh Kong for the INC, 2002, see Figure 6).	1. By the end of the project, vulnerability maps for each of the four coastal provinces are produced.	1a. Vulnerability maps. 1b. Interviews with MLMUPC.	Assumption: Climate change concerns are not overshadowed by other emergency matters or urgent projects. Assumption: There is political commitment at the national and local

	2. A comprehensive adaptation plan, including guidance on zoning and land use planning in the context of climate change, is developed for the coastal zone (yes/no).	2. Such a comprehensive adaptation plan has not yet been developed for the coastal zone.	2. By the end of the project, a comprehensive adaptation plan is developed for the coastal zone.	2a. Interviews with district- and provincial-level authorities and the CCU. 2b. The adaptation plan.	levels to enforce existing regulations on the use and development of marine and coastal natural resources. Risk: Lack of commitment from communities. Risk: Institutions do not allow for inter-institutional data sharing, planning and implementation of actions for climate change adaptation measures.
Outcome 3 Vulnerability of productive systems to increased floods reduced.	1. The percentage change in the income of men and women in the demonstration sites. 2. The percentage change in subsistence food production of male and female subsistence farmers in the demonstration sites. 3. Number of men and women from	1. The baseline will be determined through surveys undertaken during project implementation. 2. The baseline will be determined through surveys undertaken during project implementation. 3. At present, local communities'	1a. Mid-way through the project, a 10% increase in income of men and women. 1b. By the end of the project, a 20% increase in income of men and women. 2a. Mid-way through the project, a 10% increase in annual food production. 2b. By the end of the project, a 20% increase in annual food production. 3a. Mid-way through the project, at least 20% of the population	1a. Gender-sensitive surveys undertaken within demonstration sites. 1b. End of project evaluation reports. 2a. Gender-sensitive surveys undertaken within demonstration sites. 2b. VRAs. 2c.End of project evaluation reports. 3. Gender-sensitive surveys among	Assumption: Large-scale infrastructural developments will not take place within the coastal zone during project implementation that will unduly disturb the coastal ecosystem or the project's planned activities. Assumption: There is political commitment at the national and local levels to enforce existing regulations on the use and development of marine and coastal natural resources. Assumption: Demonstration sites are best placed to

	local communities aware of climate change vulnerability and adaptation responses. 4. Number of men and women in the demonstration sites whose perceived vulnerability to climate change has decreased.	understanding of climate change and its impacts and importantly, how to adapt, is minimal. The baseline will be determined in the inception phase through surveys. 4. Perceived vulnerability to climate change will be determined during the inception phase through surveys.	within demonstration site communities are aware of climate change impacts and adaptation options based on their involvement with demonstration site interventions. 3b. By the end of the project, at least 50% of the population within demonstration site communities are aware of climate change impacts and adaptation options. 4. By the end of the project, at least 80 people in the demonstration sites express a reduction in their perceived vulnerability to climate change.	demonstration site communities regarding climate change impacts and adaptation options, VRAs. 4. Gender-sensitive surveys among demonstration site communities.	demonstrate the benefits of measures to adapt to climate change. Assumption: Local communities are willing to pursue alternative livelihoods. Risk: Lack of commitment from communities. Risk: Limited gain in livelihood related to agricultural protection measures and/or mangrove rehabilitation might reduce community participation. Risk: Extreme climate events such as floods and droughts could disrupt project activities and/or damage ecosystems and infrastructure. Risk: Competing activities for land use could cause conflict in relation to the implementation of adaptation measures.
Outcome 4 Resilience of coastal buffers to climate change increased and livelihoods improved.	1. Number of hectares of mangrove forests rehabilitated within the demonstrations sites.	1. Surveys undertaken during the inception phase will determine the extent of mangrove forests within the demonstration site	1a. Mid-way through the project, at least 15 ha of mangrove forests within the demonstration sites is replanted. 1b. By the end of the project, at	1. Ecological surveys and field visits.	Assumption: Demonstration sites are best placed to demonstrate the benefits of measures to adapt to climate change.

	2. Number of hectares of replanted mangroves that survive.	requiring rehabilitation. 2. Not applicable as replanting by the project is yet to take place.	least 90 ha of the mangrove forests within the demonstration sites is replanted. (These targets are likely to be re-assessed in light of the baseline) 2. By the end of the project, at least 30 ha of mangroves planted by the project's efforts survive[129].	2. Ecological surveys and field visits.	Assumption: Local communities are willing to pursue alternative livelihoods. Risk: Limited gain in livelihood related to agricultural protection measures and/or mangrove rehabilitation might reduce community participation. Risk: Extreme climate events such as floods and droughts could disrupt project activities and/or damage ecosystems and infrastructure. Risk: Competing activities for land use could cause conflict in relation to the implementation of adaptation measures. Risk: Lack of commitment from communities.

[129] This percentage is based on the results of the following paper: Gilman, E. & Ellison, J. 2007. Efficacy of Alternative Low-cost approaches to Mangrove Restoration, American Samoa. Estuaries and Coasts. 30: 641-651.

Appendix 5: Workplan and timetable

Output	Activity	Year 1				Year 2				Year 3				Year 4			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Outcome 1: Institutional capacity to assess climate change risks and integrate them into national development policies strengthened.																	
Output 1.1	1.1.1																
	1.1.2																
	1.1.3																
	1.1.4																
	1.1.5																
	1.1.6																
Output 1.2	1.2.1																
	1.2.2																
	1.2.3																
	1.2.4																
	1.2.5																
Output 1.3	1.3.1																
Output 1.4	1.4.1																
	1.4.2																
	1.4.3																
	1.4.4																
	1.4.5																
Outcome 2: Adaptation planning in the coastal zone improved.																	
Output 2.1	2.1.1																
	2.1.2																
	2.1.3																
	2.1.4																
	2.1.5																
Output 2.2	2.2.1																
	2.2.2																
	2.2.3																
	2.2.4																
	2.2.5																
Outcome 3: Vulnerability of productive systems to increased floods reduced.																	

Output 3.1	3.1.1																
	3.1.2																
	3.1.3																
	3.1.4																
Outcome 4: Resilience of coastal buffers to climate change increased and livelihoods improved.																	
Output 4.1	4.1.1																
	4.1.2																
Output 4.2	4.2.1																
	4.2.2																
	4.2.3																
	4.2.4																
	4.2.5																

Appendix 6: Key deliverables and benchmarks

See Appendix 4: Results Framework and Appendix 7: Costed M&E Plan.

Appendix 7: Costed M&E plan

Type of M&E activity	Responsible Parties	Budget US$ Excluding project team staff time	Time frame
Inception Workshop and Report	▪ NPC ▪ Assistant Coordinator ▪ UNEP Task Manager (TM) ▪ STA	Indicative cost: 10,000	Within first two months of project start up
Measurement of Means of Verification of project results.	▪ UNEP TM, STA, Assistant Coordinator and NPC will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members.	To be finalized in Inception Phase and Workshop.	Start, mid and end of project (during evaluation cycle) and annually when required.
Measurement of Means of Verification for Project Progress on output and implementation	▪ Oversight by NPC, STA, Assistant Coordinator and project team	To be determined as part of the AWP's preparation.	Annually prior to PIR and to the definition of annual work plans
PIR	▪ NPC ▪ Assistant Coordinator ▪ STA ▪ UNEP TM	None	Annually
Periodic status/ progress reports	▪ NPC ▪ STA ▪ Assistant Coordinator	None	Quarterly
Mid-term Evaluation	▪ NPC ▪ STA ▪ UNEP TM ▪ External Consultant	Indicative cost: 30,000	At the mid-point of project implementation.
Final Evaluation	▪ NPC ▪ Assistant Coordinator ▪ STA ▪ UNEP TM ▪ External Consultant	Indicative cost : 35,000	At least three months before the end of project implementation
Project Terminal Report	▪ NPC ▪ Assistant Coordinator ▪ STA ▪ UNEP TM	None	At least three months before the end of the project
Audit	▪ UNEP TM ▪ NPC	Indicative cost per year: 2,500 (Total of 10,000)	Yearly
Visits to field sites	▪ UNEP ▪ NCCC representatives	For GEF supported projects, paid from IA fees and operational budget	Yearly
TOTAL indicative COST Excluding project team staff time and UNEP staff and travel expenses		Estimated to cost US$ 85,000	

Appendix 8: Summary of reporting requirements and responsibilities

Reporting requirements	Due date	Responsibility
Inception Workshop Report	1 month after Project Inception Workshop	▪ NPC ▪ Assistant Coordinator ▪ UNEP Task Manager (TM) ▪ STA
Expenditure report accompanied by explanatory notes		▪ NPC ▪ Finance and Administration Assistant
Cash Advance request and details of anticipated disbursements		▪ NPC ▪ Finance and Administration Assistant
Supervision Plan	Before the end of the project's inception phase	▪ UNEP
Progress reporting	Half-yearly	▪ NPC ▪ STA ▪ Assistant Coordinator
Audited report for expenditures for year ending 31 December	Yearly on or before 30 June	▪ Executing partners/MoE/UDC
Inventory of non-expendable equipment	Yearly on or before 31 January	▪ NPC ▪ Finance and Admin officer
Co-financing report	Yearly on or before 31 July	▪ NPC
PIR	Yearly	▪ NPC ▪ Assistant Coordinator ▪ STA ▪ UNEP TM
Minutes of project steering committee meetings	Twice a year (or as relevant)	▪ NPC
Completion report	6 months of project completion date	▪ NPC ▪ IA
Final inventory of non-expendable equipment		▪ NPC
Equipment transfer letter		▪ NPC
Final expenditure statement	3 months of project completion date	▪ NPC ▪ UNEP
Mid-term evaluation	Midway though project lifetime	▪ NPC ▪ STA ▪ UNEP TM ▪ External Consultant
Final evaluation	Three months prior to the project end date	▪ NPC ▪ Assistant Coordinator ▪ STA ▪ UNEP TM ▪ External Consultant
Final audited report for expenditures of project	6 months prior to project completion date	▪ EA
Independent terminal evaluation report	3 months prior to project completion date	▪ NPC ▪ Assistant Coordinator ▪ STA ▪ UNEP TM

Appendix 9: Standard Terminal Evaluation TOR

Below are the standard Terminal Evaluation TORs of UNEP.

Objective and Scope of the Evaluation

The objective of the terminal evaluation is to examine the extent and magnitude of any project impacts to date and determine the likelihood of future impacts. The evaluation will also assess project performance and the implementation of planned project activities and planned outputs against actual results.

Methods

This terminal evaluation will be conducted as an in-depth evaluation using a participatory approach whereby the UNEP Task Manager, key representatives of the executing agencies and other relevant staff are kept informed and consulted throughout the evaluation. The consultant will liaise with the UNEP and the UNEP Task Manager on any logistic and/or methodological issues to properly conduct the review in as independent a way as possible, given the circumstances and resources offered. The draft report will be circulated to UNEP Task Manager, key representatives of the executing agencies and the UNEP. Any comments or responses to the draft report will be sent to UNEP for collation and the consultant will be advised of any necessary or suggested revisions.

Key Evaluation principles

In attempting to evaluate any outcomes and impacts that the project may have achieved, evaluators should remember that the project's performance should be assessed by considering the difference between the answers to two simple questions ***"what happened?***" and ***"what would have happened anyway?"***. These questions imply that there should be consideration of the baseline conditions and trends in relation to the intended project outcomes and impacts. In addition it implies that there should be plausible evidence to **attribute** such outcomes and impacts **to the actions of the project**.

Sometimes, adequate information on baseline conditions and trends is lacking. In such cases this should be clearly highlighted by the evaluator, along with any simplifying assumptions that were taken to enable the evaluator to make informed judgements about project performance.

Appendix 10: Decision-making flowchart and organisational chart

See Section 4: Institutional Framework and Implementation Arrangements and Figure 9.

Appendix 11: Terms of Reference for key project groups, staff and sub-contractors[130]

Terms of Reference for Project Steering Committee (PSC)

Background

The PSC is responsible for undertaking management-related and technical decisions for the project in accordance with this ToR and to provide guidance and direction for the project on a regular basis.

The PSC will review and approve the AWPs and reports and six-monthly work plans and reports. Based on approved six-monthly plans, the PSC will approve the disbursement to the PSB for approval. The PSC is required to authorize any substantive deviation from the agreed AWP. The PSC ensures that necessary resources are committed, and arbitrates on any conflicts within the project or negotiates a solution to any problems between the project and external bodies. In addition, the PSC approves the responsibilities of the NPC. Additionally, the PSC will receive guidance from the PSB regarding funding and implementation.

The PSC will comprise the following members:

- Director generals from key ministries;
- The NPD (or his alternate);
- A representative from the NCSC;
- Four provincial governors (from Kampot, Kep, Koh Kong and Sihanoukville); and
- A representative from UNEP.

In addition, the PSC will include, as support staff, the NPC and the STA. The PSC will be chaired by MoE. The PSC will meet at least six-monthly or as required by the Chair of the PSC.

Scope of Work

Specific responsibilities of the PSC are as follows:

- Ensure that project objectives are fulfilled in an effective and efficient manner.
- Approve work plans and budgets, and other reports that may be required.
- Ensure effective quality assurance and financial reporting requirements.
- Ensure institutional coordination and facilitate an effective communication and decision-making process between Government, implementation partners, Civil Society and other key actors.
- Monitor and evaluate project implementation to ensure consistency with the approved work plans and results framework of the project and ensure compliance with the rules and procedures of the CCCA.
- Ensure CCCA Programme Support Board is informed of any changes or issues likely to impact on the delivery of the project outcomes as per the Project Result Framework
- Review, revise and approve ToRs for staff, consultants and contractors required to assist in project implementation, as proposed by the NPC.

[130] Details of the ToRs as well as qualifications of staff and sub-contractors will be finalised during the Inception Workshop.

Terms of Reference for National Project Coordinator (NPC)

Scope of Work

The NPC will play a key role in project execution and has the daily responsibility for management, coordination, and supervision of the implementation of the project and delivery of the results in accordance with the project document and agreed work plans. The NPC will be nominated from the CCU.

The responsibilities of the NPC will include:

- Oversee and manage project implementation, monitor work progress, and ensure timely delivery of outputs.
- Report to the NCCC regarding project progress.
- Develop and facilitate implementation of a comprehensive monitoring and reporting system.
- Ensure necessary coordination with the CCCA Support Programme and other activities through the CCCA NPC.
- Ensure timely preparation of detailed annual work plans and budgets for approval by PSB.
- Assist in the identification, selection and recruitment of staff, consultants and other experts as required.
- Supervise, coordinate and facilitate the work of the administrative/technical team (consisting of the assistant coordinator, finance/administration staff and national and international consultants).
- Control expenditures and assure adequate management of resources.
- Identify relevant, on-going activities by other government and non-government agencies within the coastal zone, and establish linkages/networks.
- Provide input to management and technical reports and other documents as described in the M&E plan for the overall project. Reports should contain assessments of progress in implementing activities, including reasons for delays, if any, and recommendations on necessary improvements.
- Inform the CCCA NPC, without delay, of any issue or risk which might jeopardise the success of the project.
- Liaise and coordinate with UNEP on a regular basis.

Qualifications

- Masters degree in environment, natural resources management or a closely related field.
- A minimum of 10 years relevant work experience.
- Demonstrated solid knowledge of environment and coastal zone management.
- Experience in the public participation development process associated with environment and sustainable development an asset.
- Experience in working and collaborating within governments an asset.
- Excellent knowledge of English including writing and communication skills.

Reporting

The NPC will be a staff member of the MoE and will report to the NPC. The NPC will work closely with the NPC, STA and UNEP to ensure the availability of information on progress and performance in the implementation of the project.

Terms of Reference for the Assistant Coordinator

The Assistant Coordinator will work closely with the NPC to effectively manage the project. The NPC will delegate work to the Assistant Coordinator. Additionally, the Assistant Coordinator will act as a liaison between the NPC and the other administrative/technical staff. The ToR of the Assistant Coordinator will be further developed during the implementation of the project. The Assistant Coordinator will be nominated from the Department of Coastal Zones and Wetlands.

Terms of Reference for the Senior Technical Advisor (STA)

Scope of Work

The STA will provide technical guidance on the implementation of the project to the PM and will also assist the PM in leading the project. The STA is likely to be sourced as an international consultant as the technical expertise required is currently unavailable within Cambodia.

Responsibilities

- Undertake technical review of project outputs (e.g. studies and assessments).
- Assist in the drafting of TORs for technical consultancies.
- Supervise the work of consultants.
- Assist in monitoring the technical quality of project M&E systems (including AWPs, indicators and targets).
- Conduct the financial administrative reporting and the PIR.
- Provide advice on best suitable approaches and methodologies for achieving project targets and objectives.
- Provide a technical supervisory function to the work carried out by the other technical assistance consultants hired by the project.
- Assist in knowledge management, communications and awareness raising.

Qualifications

- At least an advanced post-graduate at or above a M.Sc. qualification in a relevant discipline including environmental management, natural resources management, engineering or related discipline.
- A minimum of 5 years experience in a senior technical lead position with planning and management of environmental and/or natural resources management programmes in developing countries. Experience in coastal zones is an advantage.
- A minimum of 5 years in a senior technical position involved in institutional strengthening and capacity building
- Previous similar experiences in provision of technical support to complex projects.
- Experience from Cambodia would be an advantage.
- Good communication and computer skills.
- Fluent in spoken and written English.

Reporting

The STA will report to the chair of the PSC. The STA will cooperate with the CCCA Chief Technical Advisor, the NPC and the CCCA NPC to ensure the availability of information on progress and performance in the implementation of the project. The STA will support the NPC to liaise with and coordinate with CCCA NPC and Technical Advisors in the CCCA Support Programme. In the implementation of his/her duties, the STA will work in close collaboration with UNEP in consultation with which will take decisions for implementation and decision making of the project.

Terms of Reference of the Administrative and Financial Assistant

At least one administrative and financial assistant will report to the Assistant Coordinator (and thereby to the NPC). During the implementation of the project, it may be decided that more than one assistant is required.

The Assistant Coordinator will hold the following responsibilities:

- Standardise the finance and accounting systems of the project while maintaining compatibility with the government and UNEP financial accounting procedures.
- Prepare revisions of the budgets and assist in the preparation of the AWPs.
- Comply and verify budget and accounting data by researching files, calculating costs, and estimating anticipated expenditures from readily available information sources.
- Prepare status reports, progress reports and other financial reports.
- Process all types of payments requests for settlement purposes including quarterly advances to the partners upon joint review.
- Prepare periodic accounting records by recording receipts, disbursements (ledgers, cash books, vouchers, etc) and reconciling data for recurring or financial special reports and assist in preparation of annual procurement plans.
- Undertake project financial closure formalities including submission of terminal reports, transfer and disposal of equipment, processing of semi-final revisions, and support professional staff in preparing the terminal assessment reports.
- Assist in the timely issuance of contracts and assurance of other eligible entitlements of the project personnel, experts, and consultants by preparing annual recruitment plans.

Terms of Reference for International Consultants

The types of international consultants required by the project are included after the project budget in Appendix 1. These consultants will be hired to perform the following tasks:

- Collect data.
- Provide advice relevant to their field.
- Monitor interventions.

Additionally, the international consultants must be experts in their field, with experience in climate change, capacity building, and research and information development. Additionally, they should have good knowledge and understanding of Cambodia's climate change risks and an appropriate M.Sc. degree and a minimum of 5 years experience or an appropriate bachelors degree and 10 years experience in their field of expertise. Fluency in spoken and written English is required and special preference will be given to international consultants who can speak and understand Khmer.

Terms of Reference for National Consultants

Local expertise will be sourced where possible in place of international expertise in order to strengthen in-country capacity. National consultants will be hired by the project to:

- Collect data.
- Provide advice relevant to their field.
- Monitor interventions.

Additionally, the national consultants must be experts in their field, with experience in climate change, capacity building, and research and information development. Additionally, they should have good knowledge and understanding of Cambodia's climate change risks and an appropriate M.Sc. degree and a minimum of 5 years experience or an appropriate bachelors degree and 10 years experience in their field of expertise. National consultants need to be fluent in spoken and written English as well as in Khmer.

The hiring procedures to be followed for both international and national consultants must include a transparent and competitive process based on normal UNEP procedures.

Terms of Reference of national focal points/ teams

The ToRs of the national focal points and team in the different ministries will be drafted upon initiation of the project and endorsed by the PSC.

Appendix 12: Co-financing commitment letters from project partners

KINGDOM OF CAMBODIA
NATION-RELIGION-KING

Ministry of Environment

No : 599 MoE

Phnom Penh, 30 September 2010

Ms. Maryam Niamir-Fuller
Director, Division of GEF Coordination,
United Nations Environment Programme
P.O. Box 30552-00100, Nairobi, Kenya

Subject: Royal Government of Cambodia Co-financing commitment to the UNEP/GEF Project "Vulnerability Assessment and Adaptation Programme for Climate Change in the Coastal Zone of Cambodia considering Livelihood Improvement and Ecosystems"

Dear Ms. Maryam Niamir-Fuller,

I wish to express the Royal Government of Cambodia (RGC) endorsement to the UNEP/GEF project "Vulnerability Assessment and Adaptation Programme for Climate Change in the Coastal Zone of Cambodia considering Livelihood Improvement and Ecosystems", which I believe will contribute considerably to the enhancement of the adaptation capacities and measures in the coastal provinces of Cambodia.

This programme is indeed timely for my country, which is currently undertaking several efforts to respond to the present and future impacts of climate change. While focusing on climate change adaptation, the proposed GEF intervention will also greatly benefit the overall sustainable development of our coastal areas and would bring an important additional value to other ongoing government efforts.

To ensure effective and successful implementation of sustainable development related programmes, the RGC has in the past years established a number of cross-sectoral National Committees, including the National Climate Change Committee (NCCC). The Climate Change Department under the Ministry of Environment has the honor of serving as a Secretariat for the NCCC.

On behalf of the Committee I would like to confirm that the GEF proposed intervention would provide important added value to the following government efforts in the coastal area totaling US$ 1,800,000 of baseline co-financing:

1) Ministry of Water Resources and Meteorology Project no. P.90 Rehabilitation of Prey Nup Reservoir, US$ 1,400,000 and
2) Ministry of Agriculture, Forestry and Fisheries, 1d. Forestry Reforms – Proper Management of Mangrove Forest Resources, US$ 400,000.

No. 48, Samdech Preah Sihanouk, Tonle Bassac, Chamkarmon, Phnom Penh, CAMBODIA, Fax : 855 23 21 25 40 Phone : Standard 023 21 34 62
023 21 29 94

The Ministry of Environment will in addition provide in-kind contribution in amount US$ 195,000 through providing working facilities for the programme at the Coastal Resources Centers (CRCs) located in the four coastal provinces.

We look forward to your continued cooperation.

Yours sincerely,

Senior Minister and Minister of Environment

Chairman, National Climate Change Committee

Dr. Mok Mareth

United Nations Development Programme

UNDP Cambodia

14 September 2010

Dear Ms. Maryam Niamir-Fuller,

Subject: UNDP Co-financing commitment to the UNEP/GEF Project "Vulnerability Assessment and Adaptation Programme for Climate Change in the Coastal Zone of Cambodia considering Livelihood Improvement and Ecosystems"

UNDP has established the "Cambodia Climate Change Alliance (CCCA)" that aims at making Climate Change activities in Cambodia nationally owned, led, and aligned with Cambodia's development priorities, and ensuring that they are effectively coordinated and implemented. The CCCA Programme Support Board has recently approved funding for a 3-year coastal zone project of US$2,200,000, implemented by UNEP to support adaptation activities in coastal areas in Cambodia.

The UNDP Cambodia Office would like to confirm its commitment to provide parallel funding related to "***coastal adaptation***" from the Cambodia Climate Change Alliance Programme (CCCA) to the UNEP/LDCF project titled "*Vulnerability Assessment and Adaptation Programme for Climate Change in the Coastal Zone of Cambodia considering Livelihood Improvement and Ecosystems.*"

The UNDP contribution as indicated above is considered as parallel funding to the UNEP/LDCF project and will enhance the impact of the UNEP/LDCF project outputs and outcomes.

We look forward to our continued cooperation.

Yours sincerely,

Elena Tischenko
Country Director

Ms. Maryam Niamir-Fuller,
Director, Division of GEF Coordination,
United Nations Environment Programme
P.O. Box 30552-00100, Nairobi, Kenya

CC:
Max Zieren, UNEP/DGEF Regional Focal Point Asia, UNEP Regional Office Asia Pacific, Bangkok

No. 53, Street 51, Boeung Keng Kang, Phnom Penh, Cambodia Tel: 023-216 167 Fax: 023 216 257 www.un.org.kh/undp

Appendix 13: Endorsement letters of GEF National Focal Points

KINGDOM OF CAMBODIA
NATION-RELIGION-KING

196
09

Ministry of Environment

No : 2036G MoE

Phnom Penh 24th December 2008

To: Maryam Niamir-Fuller
GEF Executive Coordinator and Director
Division of Global Environment Facility (GEF) Coordination
UNEP, PO Box 30552 Nairobi, Kenya
Room P-205
fax: (254 20) 762-4041

Subject: Endorsement for Vulnerability Assessment and Adaptation Measures for Climate Change in the Coastal Zone of Cambodia considering livelihood improvement, ecosystems and biodiversity

In my capacity as GEF Operational Focal Point for Cambodia, I confirm that the above project proposal (a) is in accordance with the government's national priorities, including, if available, the priorities identified in the National Adaptation Plan of Action, and the commitments made by Cambodia under the relevant global environmental conventions and (b) has been discussed with relevant stakeholders, including the UNFCCC focal point, in accordance with GEF's policy on public involvement.

Accordingly, I am pleased to endorse the preparation of the above project proposal with the support of UNEP. If approved, the proposal will be prepared and implemented by the National Coastal Steering Committee (MoE). Further, I request UNEP to provide a copy of the project document for information of this office before it is submitted to the GEF Secretariat for CEO endorsement.

I understand that the total LDCF financing being requested for this project is $2,378,000.-, inclusive of project preparation grant (PPG), if any, and Agency fee (10%) to UNEP for project cycle management services associated with this project.

Sincerely,

Dr. Lonh Heal, Operational Focal Point
Director General.,
Ministry of Environment

UNEP
DIVISION OF GEF COORDINATION
RECEIVED
05 JAN 2009
WHO: Liza Leclerc
FILE IN:

Copy to: UNFCCC Focal Point

No. 48, Samdech Preah Sihanouk, Tonle Bassac, Chamkarmon, Phnom Penh, CAMBODIA, Fax : 855 23 21 25 40 Phone : Standard 023 21 34 62
023 21 29 94

Appendix 14: Draft procurement plan

The GEF funds will be disbursed through contracts or LoAs between the EA and the individual consultants, in accordance with national rules and procedures for procurement for Outcomes 1, 2, 3 and 4. The national partner institutions will contribute to the outcomes based on their respective expertise and financial capabilities.

The table below specifies the technical assistance consultancies planned for Outcomes 1, 2, 3 and 4 (including both local and international consultants).

For Technical Assistance			
Local	***$/ person months***	***Estimated person months***	***Tasks to be performed***
Local M&E Expert	3000	2	The local M&E Expert will work closely with the International M&E Expert, who will delegate work to the local M&E Expert (see below).
Climate change expert	3000	8	Work closely with other national consultants (NCs) to collect relevant data for the identification of the climate change indicators; assist with the assessment of climate change risks in the coastal zone; assist with the identification of appropriate climate change models; assist the international consultants (ICs) where necessary; undertake the gap analysis with the policy expert IC to determine the extent to which climate change considerations are included; contribute to the development of the climate change trends monitoring plan; work closely with the other NCs and with the ICs employed for activities under Outcome 2 and the STA to undertake investigations into vulnerability to climate change impacts along the coastal zone; assist in the identification of additional demonstration adaptation activities.
GIS Expert	3000	2	Develop the maps to be included in the climate change indicators report detailing the extent of each particular indicator within each province/district/commune within the coastal zone; contribute to the development of the land use planning guide.

Socio-economist	3000	8	Contribute to the identification of the climate change indicators; assist in the development of the land use planning guide; contribute to the vulnerability assessments and mapping exercises; assist in the identification of additional demonstration sites/activities; ascertain the cost-effectiveness and potential for up-scaling of the adaptation measures.
Natural resources specialist	3000	1	Contribute to the identification of the climate change indicators; assist in the development of the land use planning guide.
Environmental specialist	3000	1	Contribute to the identification of the climate change indicators; assist in the development of the land use planning guide.
Workshop facilitator	3000	1	Facilitate and run the national-level climate change adaptation training workshop and the workshop regarding the climate change indicators identified.
Water resources	3000	5	Work closely with the other NCs and with the ICs employed for activities under Outcome 2 and the STA to undertake investigations into vulnerability to climate change impacts along the coastal zone; assist in the identification of additional demonstration adaptation activities.
Agriculture	3000	7	Work closely with the other NCs and with the ICs employed for activities under Outcome 2 and the STA to undertake investigations into vulnerability to climate change impacts along the coastal zone; assist in the identification of additional demonstration adaptation activities.
Forestry/mangrove	3000	6	Work closely with the other NCs and with the ICs employed for activities under Outcome 2 and the STA to undertake investigations into vulnerability to climate change impacts along the coastal zone; assist in the identification of additional demonstration adaptation activities.
Infrastructure	3000	1	Work closely with the other NCs and with the ICs employed for activities under Outcome 2 and the STA to undertake investigations into vulnerability to climate change impacts along the coastal zone; assist in the identification of additional demonstration adaptation activities.
Cartographic expert	3000	2	Assist in the development of the vulnerability maps for the coastal zone.

Land use/spatial planner	3000	7	Work with the STA and the anthropologist to develop the detailed vulnerability maps (including working closely with community members to gather their input) and to provide advice regarding the development of the adaptation plans.
Anthropologist	3000	2	Work with the STA and the land use/spatial planner to develop the detailed vulnerability maps (including working closely with community members to gather their input) and to provide advice regarding the development of the adaptation plans.
Meteorologist	3000	2	Work closely with the other NCs and with the ICs employed for activities under Outcome 2 and the STA to undertake investigations into vulnerability to climate change impacts along the coastal zone; assist in the identification of additional demonstration adaptation activities.
Policy expert	3000	3	Develop policy briefs and guidelines for local application based on the assessments undertaken as part of Output 4.2.
International	***$/person days***	***Estimated person days***	
STA	550	376	The STA will fulfill the following functions: i) quality assurance and technical review of project outputs (e.g. studies and assessments); ii) assistance in drafting TORs for technical consultancies and supervision of consultants work; iii) assistance in monitoring the technical quality of project M&E systems, including annual workplans, indicators and targets; iv) providing advice on best suitable approaches and methodologies for achieving project targets and objectives; v) provide a technical supervisory function to the work carried out by the other technical assistance consultants hired by the project; and vi) assisting in knowledge management, communications and awareness raising.

Climate change adaptation specialist	550	172	Provide technical assistance on the training to be undertaken (which will include training on assessing climate change impacts, sensitivity, exposure, trends and vulnerability, risk analysis and risk assessment, and funding for adaptation measures including an analysis of the climate change analytical tools, methodologies, software available for identification and implementation of adaptation measures); develop the adaptation methodology with help from other ICs and NCs; assist with the capturing of the project's lessons learned for the awareness raising workshops; assist in the development of climate change-related indicators for the coastal zone; undertake the training of national- and provincial-level staff required regarding climate change considerations in the coastal zone; assist in the capacity building exercises related to climate risk assessments and analyses; develop the coastal adaptation plans in collaboration with CCD, MoE and other key departments; work closely with the NCs to determine the cost-effectiveness of each demonstration activity through the conduction of an economic analysis and cost-benefit analyses.
Policy expert	550	20	Work closely with the NCs to identify existing policy gaps relating to the coastal zone (and specifically the lack of consideration for climate change impacts and adaptation); draft suggested revisions to national policy documents in order to increase the efficiency of climate risk reduction in the coastal zone.
Climate change modeller	550	100	Undertake climate scenario modelling of climate change impacts on the coastal zone; undertake capacity building exercises related to the interpretation of climate modelling and impact modelling results; provide input related to the development of the coastal adaptation plans.
Water resources modeler	550	53	Model the impacts climate change is likely to have on water resources within the coastal zone.
Oceanographer	550	33	Model climate change impacts on oceanic variables.
Shoreline management expert	550	27	Provide land use planning and advice relevant to vulnerable areas along the coast; work with the STA to identify particularly vulnerable sites and sensitive communities and to further clarify the extent of climate change impacts on the coastal zone.

Spatial/land use planner	550	66	Develop detailed coastal vulnerability maps; provide advice regarding the development of the adaptation plans.
Ecosystem services expert	550	40	Determine the value of ecosystem services from intact mangrove forests and the costs of damaging the mangroves.
Livelihoods expert	550	66	Conduct assessments to determine the costs and benefits of particular alternative livelihood options.
International M&E Expert	550	37	The M&E expert will be responsible for the following: establishing the overall results-based M&E strategy in accordance with M&E plans outlined in the project document; providing project performance information to the PSC and the NPC; designing a system for collecting information on project lessons; preparing lessons learned documents; developing questionnaires and other data collection tools that will be used to collect information during the project period for writing technical reports (together with subject matter specialists); guiding the review of the project Strategic Results Framework. This will be undertaken with assistance from the local M&E expert.

Appendix 15: Tracking Tools

	Indicator	Baseline	Targets	Source of verification
Project Objective: "to reduce the vulnerability of coastal communities to the impacts of climate change by strengthening policy and science, and demonstrating targeted local interventions to increase ecosystem resilience."	1. The percentage change in vulnerability of men and women living in the demonstration sites to climate change risks threatening the coastal zone.	1. The baseline will be determined in the demonstration sites in the inception phase through a VRA.	1a. Mid-way through the project, a 20% increase in the VRA score. 1b. By the end of the project, a 50% increase in the VRA score.	1. Gender-sensitive field surveys/VRA.
Outcome 1 Institutional capacity to assess climate change risks and integrate them into national development policies strengthened.	1. Number of government agencies participating in the data network (i.e. collecting and analysing climate-related data related to the coastal zone and disseminating results to the CCU). 2. Climate change risks determined for the coastal zone through modelling of climate change impacts (yes/no). 3. Number of relevant national development plans and policies which include climate change considerations.	1. A data network has not been established in Cambodia. 2. Climate change impacts and risks have not yet been modelled for the coastal zone in Cambodia. 3. At present, climate change considerations (including adaptation) are largely absent from	1. At least 5 relevant government agencies participating in the network and disseminating climate-related analyses relevant to the coastal zone to the CCU. 2a. Mid-way through the project, summary reports and policy briefs regarding the results of modelling have been developed for Koh Kong and Sihanoukville provinces. 2b. By the end of the project, summary reports	1. Interviews with relevant government agencies and with the CCU. 2. Summary report and policy briefs developed regarding the modelling. 3a. Revised documents. 3b. Interviews with agencies concerned.

	4. Number of indicators for monitoring climate change impacts within the coastal zone developed.	relevant national development plans and policy (although climate change is included in the updated NSDP) and emphasis is placed, rather, on post-disaster emergency relief. 4. At present, specific indicators to measure climate change indicators are not available.	and policy briefs regarding the results of modelling have been developed for Kampot and Kep provinces. 3. By the end of the project, at least two national development plans/policies relevant to the coastal zone are revised to include climate change considerations. 4. By the end of the project, at least five indicators have been developed, measured and documented for the coastal zone.	4. The report developed detailing the indicators for inclusion in the 3rd State of the Environment Report.
Outcome 2 **Adaptation planning in the coastal zone improved.**	1. Number of detailed vulnerability maps produced. 2. A comprehensive adaptation plan, including guidance on zoning and land use planning in the context of climate change, is developed for the coastal zone	1. Vulnerability maps taking into account climate change risks are not presently available for the entire coastal zone (one was developed for Koh Kong for the INC, 2002, see Figure 6). 2. Such a comprehensive adaptation plan has not yet been developed for the coastal zone.	1. By the end of the project, vulnerability maps for each of the four coastal provinces are produced. 2. By the end of the project, a comprehensive adaptation plan is developed for the coastal zone.	1a. Vulnerability maps. 1b. Interviews with MLMUPC. 2a. Interviews with district- and provincial-level authorities and the CCU. 2b. The adaptation plan.

	(yes/no).			
Outcome 3 Vulnerability of productive systems to increased floods reduced.	1. The percentage change in the income of men and women in the demonstration sites. 2. The percentage change in subsistence food production of male and female subsistence farmers in the demonstration sites. 3. Number of men and women from local communities aware of climate change vulnerability and adaptation responses. 4. Number of men and women in the demonstration sites whose perceived vulnerability to climate change has decreased.	1. The baseline will be determined through surveys undertaken during project implementation. 2. The baseline will be determined through surveys undertaken during project implementation. 3. At present, local communities' understanding of climate change and its impacts and importantly, how to adapt, is minimal. The baseline will be determined in the inception phase through surveys. 4. Perceived vulnerability to climate change will be determined during the inception phase through surveys.	1a. Mid-way through the project, a 10% increase in income of men and women. 1b. By the end of the project, a 20% increase in income of men and women. 2a. Mid-way through the project, a 10% increase in annual food production. 2b. By the end of the project, a 20% increase in annual food production. 3a. Mid-way through the project, at least 20% of the population within demonstration site communities are aware of climate change impacts and adaptation options based on their involvement with demonstration site interventions. 3b. By the end of the project, at least 50% of the population within demonstration site communities are aware of climate change impacts and adaptation options.	1a. Gender-sensitive surveys undertaken within demonstration sites. 1b. End of project evaluation reports. 2a. Gender-sensitive surveys undertaken within demonstration sites. 2b. VRAs. 2c.End of project evaluation reports. 3. Gender-sensitive surveys among demonstration site communities regarding climate change impacts and adaptation options, VRAs. 4. Gender-sensitive surveys among demonstration site communities.

			4. By the end of the project, at least 80 people in the demonstration sites express a reduction in their perceived vulnerability to climate change.	
Outcome 4 Resilience of coastal buffers to climate change increased and livelihoods improved.	1. Number of hectares of mangrove forests rehabilitated within the demonstrations sites. 2. Number of hectares of replanted mangroves that survive.	1. Surveys undertaken during the inception phase will determine the extent of mangrove forests within the demonstration site requiring rehabilitation. 2. Not applicable as replanting by the project is yet to take place.	1a. Mid-way through the project, at least 15 ha of mangrove forests within the demonstration sites is replanted. 1b. By the end of the project, at least 90 ha of the mangrove forests within the demonstration sites is replanted. (These targets are likely to be re-assessed in light of the baseline) 2. By the end of the project, at least 30 ha of mangroves planted by the project's efforts survive[131].	1. Ecological surveys and field visits. 2. Ecological surveys and field visits.

[131] This percentage is based on the results of the following paper: Gilman, E. & Ellison, J. 2007. Efficacy of Alternative Low-cost approaches to Mangrove Restoration, American Samoa. Estuaries and Coasts. 30: 641-651.

Appendix 16: Danida project Environmental Management within the coastal zone

Phase 3 – Executive Summary

Executive Summary

The Danish International Development Assistance (Danida) has supported an Environmental Management project within the coastal zone: Cambodia since May 1997. Phase 3, with a duration of five years, started on the 1st of August, 2002.

The revised Alignment Document prepared by the project in August 2004 was endorsed as presented by the Programme Coordination Committee in October 2005. The management of project implementation has been transferred to CCU in 2005 and the daily management has been handled by the CCU since 1 January 2006.

In April 2007, the project was requested to consider water-related activities at the basin and commune/district levels. A description, revised implementation plan and revised budget were submitted to Danida in May 2007 and this was approved by Danida on 25 May 2007.
This report covers the period from 1st August 2002 to 31st December 2007.

Project Completion Status
Phase 3 of the project was started in August 2002 with the development objective to:

Sustainable development of the coastal zone of Cambodia including environmental protection and management of coastal resources for improved local livelihoods and national welfare.

The immediate objectives were:

- The NCSC functional and the CCU of the MoE operational according to its mandate including Cambodia's national policies and commitment to international agreement.
- The provincial authorities monitor and assess coastal resources and support environmental protection and community based coastal resource management.
- Coastal communities implementing participatory Local Area Coastal Resource Management taking into account building of social capital, enforcement of local user rights, involvement of women, and generation of improved livelihood to reduce poverty.

An organized review of all project outputs has been made as per the end of July 2007. All immediate objectives are considered to be satisfactory met as summarised through the completion status of Phase 3 of the outputs below:

Output 1.1: Operational coastal resource monitoring and strategic environmental assessment guidelines developed by CCU in collaboration with concerned line ministries.

The development of operational monitoring and strategic environmental assessment guidelines have required capacity building of CCU and other relevant staff and the establishment of an operational Coastal Environmental and Socio-economic Information Management System (CESIMS) and a functional Environmental Monitoring Programme. The systems and structures are now functioning.

Output 1.2: A State of the Coastal Environment and Socio-economic report prepared and published by the CCU *with provincial administrations and Commune Councils as important target groups*[132].

The 1st and 2nd State of the Coastal Environment and Socio-economy Report has been published by the CCU in 2005 and 2007, respectively. The environment and socio-economic indicator data included in the reports covers the situation and trend within the coastal zone up to 2005.

Output 1.3: A Coastal Environmental Management and Socio-economic Action Plan (CEMSAP) *with provincial administrations and Commune Councils as important target groups*[133] developed by the CCU and presented to the NCSC for approval.

The Coastal Environmental Management and Socio-economic Action Plan based on the issues identified in the State of the Coastal Environment and Socio-economic Report and discussed at the national seminars have been finalised in 2007. The draft action plan has been discussed with relevant agencies early 2007, presented at the national seminar, and approved by the NCSC in July 2007.

Output 1.4: Annual workshop/seminar on Coastal Zone Management

During Phase 3 five annual seminars on CZM in Cambodia has been held bringing the total number up to seven since 2000. The latest seminar was held in Phnom Penh in June 2007 bringing together national, provincial, district and commune authorities, and people from the involved communities. The seminars have been an important forum for discussion of the most important coastal issues. Proceedings have been prepared and published from all the seminars.

Output 1.5: Communication channels between CCU and Provincial authorities established as a feedback mechanism between the policy and the implementing level.

The institutional framework for coastal zone management was established in earlier Phases and strengthened through the November 2001 Decision Paper which laid out roles and responsibilities for the NCSC, the PWGs and importantly CCU, which has become the key coordination link between the national and provincial levels and increasingly to local authorities and village groups through the Coastal Resource Centres and their staff.
The project has strengthened the technical support infrastructure allowing smoother flow of information and technical support between the different management levels, where the CCU and the CRCs are important nodes, possessing manpower and technical resources. Through these nodes support has been provided to the technical departments at province level, Commune Councils and communities through the TFTs. As part of improving the communication channels between the provincial authorities and the local communities four Coastal Resources Centres have been constructed and operated through the project.

Output 2.1: Provincial authorities capable of producing coastal and socio-economic monitoring reports and environmental screening of commune development plans.

Provincial staff has been carrying a monitoring programme covering river and coastal water quality. This programme has been operational for a three year period including the preparation of annual reports. Provincial staff has also been implementing Urban Environmental Monitoring through traffic surveys.

[132] Alignment addition
[133] Alignment addition

Associated with all support activities to local communities in the LACRM substantial monitoring has been required and provincial staff in all provinces and municipalities has been extensively involved in the implementation of this monitoring. Quarterly monitoring has been carried out for assessment and evaluation of the impacts of the livelihood activities.

Provincial staff and commune authorities have been involved in strategic environmental assessments related to commune development planning, and catchment management planning. Provincial staff has produced SEA reports for development activities in the LACRM areas.

Output 2.2: Provincial authorities capable of supporting the preparation and implementation of participatory Local Area Coastal Resources Management (LACRM).

LACRM Plans have been implemented based on support committed through the District Integration Workshops in 2004, 2005 and 2006 in all areas. Provincial staff from key departments has been involved from the onset of support to LACRM to the finalisation of the LACRM Plans. Provincial staff has been engaged in monitoring and implementation activities related to the support committed.

Output 2.3: Facilities in place and training provided at provincial level for the enforcement of laws and regulations for environmental protection and resource utilization within the coastal zone.

Development of regulations for resource use has been facilitated in all LACRM areas, focusing mainly on fisheries and mangrove resources. A key concern related to community-based management of natural resources has been local ownership and sustainability of the communities' engagement and involvement in management. This has been a central part in the facilitation activities related to the formation of community groups.

Basic equipment including small boats and GPS, which have been used in ad hoc assistance to NREM, is placed at the centres. Investment in equipment for the CBNRM activities in the LACRM areas has been provided.

Output 2.4: Communication channels between provincial authorities and coastal communities established as feedback mechanism between the implementing and user levels.

The support to LACRM community projects has used TFTs, supported by the staff from the Coastal Resources Centres and with assistance from CCU staff. As part of the alignment, close coordination has been established with the technical staff from provincial departments attached to the EXCOMs in the overall facilitation of the support to local communities.

Output 3.1: Feasible and technically sound Local Area Coastal Resources Management (LACRM) developed and launched in selected communities.

LACRM Plans have been finalised for all four areas, reflecting the results of the participatory analyses and planning and including all commitments made at district integration workshops. Comprehensive monitoring of impacts has been conducted related to the support activities involving TFTs. An evaluation report describing the impacts of the support has been published.

Output 3.2: Livelihood strategies developed to support Local Area Coastal Resource Management within the coastal zone of Cambodia consistent with national environmental policies.

Livelihood options have been identified in the LACRM areas and a substantial Support Programme has been implemented to improve livelihood. This included training of 24 village animal health workers,

training of more than 850 farmers in 33 villages in integrated farming and associated support to improve farming practises. 66 male villagers have received 3 months vocational training and a programme to support small engine/electronic businesses has been established. 29 female villagers have received a six month training course in beautification and support to establish beautification shops in the villages.

A report has been prepared evaluating the impact on livelihood improvement by the project support.

Output 3.3: Awareness materials prepared and disseminated on the interaction between environmental protection, coastal resources and livelihoods as they are experienced within the coastal zone.

A communication strategy has been prepared providing guidance to communication and awareness raising approaches focusing on the community projects in particular including video spots on key coastal issues.

A demonstration project has been implemented in cooperation with NGOs, Ministry of Education and schools in the LACRM areas providing support to the education in 20 primary schools concerning environment and natural resources. Training modules and teacher manuals have been developed, published and teachers have been trained in their use. The training package has been implemented in 20 primary schools and small school projects on NRE have been supported.

For mass communication 5 minute video spots on CZM Issues have been produced on mangroves, pollution and livelihoods, which have been broadcasted on national TV channels. Three 1 hour debate programmes have been produced and broadcasted covering tourism and poverty, increase of marine aquaculture by cutting mangrove, and sustainable development and master plans. One of the panels for the first two debate programmes consisted of members of local communities.

A community radio programme focussing on community regulations in LACRM areas in Sihanoukville, Kampot and Kep have been broadcasting on illegal fisheries activities and fishing gears.
A 30 minute video on CMZ in Cambodia has been finalized and been broadcasted on four national TV channels. This has also been prepared with English sub-titles.

One hour interview for CTN International concerning the significance of the coastal zone, international cooperation, and legal situation. The experiences from the project regarding e.g. improved livelihood and environmental management were used as cases.

The radio programme Direct Women's Media aired a one hour programme regarding coastal zone issues and gender.

Capacity Development

A substantial capacity development has taken place during Phase 3. The CCU in MoE is now working as a well functioning unit for coordination between the National Coastal Steering Committee (NCSC) to the provincial departments and Commune Councils.

At the provincial level, departments have developed capacity by participating in focused training sessions in environmental assessment, public participation, monitoring of environment, natural resources and socio-economic indicators. This capacity has been further developed by using these capacities in actual work within the coastal zone.

Substantial capacity development has also taken place in the coastal communes and communities where more than 1000 villagers have been trained in integrated farming systems, veterinarian assistants, community based natural resources management, and different vocational training such as engine and electronic repair. All the capacity development at the commune and community level where further supported by tangible input such as livestock, fruit trees, and provision of tool boxes. A comprehensive programme was also targeting environmental awareness in 20 schools within the coastal zone and providing small demonstration projects to the schools.

Lessons Learned

An important lesson learned regarding capacity development is to maintain focus throughout the whole capacity development effort, establish local ownership and that it is a long-term effort. The project in Cambodia has been implemented through three phases also including several bridging periods, and this has resulted in somewhat changed focus during the implementation period. As the capacity at the national, provincial and commune level is very weak the support should not be too complex not to lose local understanding/ownership and it can be difficult to counterpart staff to adapt to donor induced changes without a loss in motivation or understanding.

As capacity development is a long-term effort, it is important that the counterpart staff involved have the basic education level relevant for their positions and have an age so that when the capacity development effort are finalised they will still be working within the fields strengthened through the capacity development effort, and that the involved institutions agree to a career opportunity plan for the involved staff.

Documentation

All major documents and other deliveries of the project were compiled on a series of CDs/DVDs, and submitted to Danida in December 2007.

Appendix 17: Dynamic systems modelling

Dynamic systems modelling (e.g. Threshold 21, T21) allows the complex interactions (non-linear effects with feedback) between variables in a system to be established and understood. In this respect, it can be a valuable tool for addressing developmental issues that are characterised by the complex interactions between the three spheres of development – Economy, Society and Environment.

T21 has been used to investigate the impacts of climate change on various sectors (e.g. water resources and the effect of tropical cyclones on the tourism sector), which can be used to formulate climate change-resilient adaptation policies and allows the cross-sectoral and cross-disciplinary dimensions of climate change to be captured. Hence, it would be of value for Cambodian decision- and policy-makers to engage with the relevant ministries in nearby countries in which dynamic systems modelling has been utilised, in order to facilitate knowledge sharing.

To date, T21 has been applied in more than 20 countries (including Papua, Indonesia and Bhutan, which are relatively close to Cambodia). The following information related to the use of T21 in Papua and Bhutan is extracted from the following document: *A proposal for sectoral vulnerability to climate change assessments and capacity building for six African countries using Threshold 21 Modelling. July 2010. The Millennium Institute. www.millennium-institute.org.*

T21-Bhutan: *T21 was customized for Bhutan in 2002 to investigate the impacts of climate change on agriculture and food production. Specifically, the model addressed the impact on crop yield, hydropower generation, and land use for horticulture export under various policy scenarios. The analysis concluded that the negative impact of climate change would be food shortage, reduction in hydropower generation, and lower revenues to the government from this sector. Hydropower being a major source of public revenues, this loss would diminish the capacity of the government to provide public and social services, and to fund required adjustment to the climate change. The project was implemented under the Netherlands Climate Change Studies Assistance Program (now Netherlands Climate Assistance Program).*

T21-Papua: *Working in collaboration with Conservation International and the local Papua government, T21 was customized for Papua to analyze alternative development strategies and help decision-makers determine a strategy that contributes to economic development of Papua, but not degrade its environment – an issue of major concern to the government. T21 was used to test the impact of various policy scenarios on the national development, in particular, the GDP and GNP; employment; external debt; and biodiversity. It determined that although the exploitation of natural resources would generate more provincial income, it would not improve the incomes of Papuans, as the profits would go elsewhere, while the pollution and other negative impacts would adversely affect the prospects for Papua. The model shows how focusing on improving local infrastructure and businesses would do much better for the province. The governor is still using the model to support his position.*

Appendix 18: Details regarding the demonstration sites

During the rapid assessments undertaken during the PPG phase within the two demonstration sites adaptation measures were identified for the demonstration sites. Of the measures identified (see information further down in this appendix), the following adaptation measures were deemed to be feasible based on cost information:

Intervention	Site	Details	Number of households benefiting
Koh Kong/Pream Krasaop District, Koh Kong Province			
1. Stabilise sand on Peam Krasaop Beach.	Peam Krasaop Beach	Plant pine trees (approx 4 ha) to stabilise sand on the beach and reduce coastal erosion and protect the old Peam Krasaop village from storm activity. Stabilising the beach sand will also contribute to protecting the mangroves surrounding the beach. This will cost $812/ha, i.e. a total of $3,248.	46
2. Replant 90 ha of mangroves.	Prek 1, 2 and Prek Soch	Approximately 10,000 seeds per hectare. Assemble teams to collect seeds from the water. This will cost $830/ha, i.e. a total of $74,700.	301
3. Deepen the natural lake deeper.	Toul Ki Kroum Village	Deepen the natural lake (to have a capacity of 50,625 m^3) to allow it to hold more water, which can be utilised by the Toul Ki Kroum Village for drinking and agricultural purposes. This will cost $2/$m^3$, i.e. a total of $101,250.	120
Prey Nup District, Sihanoukville Province			
1. Rebuild/rehabilitate sections of the dyke.	Ouk Gha Heng and Toul Tokoeng	Need to rebuild and raise the level of the dyke by approximately 0.5 m to protect agricultural fields from increase flooding and storm surges. This will cost $17,500 per km over 9 km, i.e. a total of $157,500.	Will positively impact 1200 households.
2. Plant Teap Tus trees to stabilise dyke soils.	Prey Nup, Ouk Yha Heng and Toul Tokoeng	This will prevent the dykes situated near mangrove forests from sinking into the soft mud and thus protect agricultural fields from floods. 15 ha of dyke will be stabilized at $812/ha, i.e. total of $12,180.	
3. Improve access to safe drinking water.	Prey Nup	Provide 20 rainwater harvesting tanks to improve access to water at $750 a tank, i.e. a total of $15,000.	170 households

The project will allocate funds to undertaking certain of these activities. Budget limitations prevent all activities from being implemented. However, the other activities identified will likely be covered by CCCA funds, which are being allocated predominately towards adaptation measures. Importantly, these activities are flexible and are likely to be fine-tuned following the results of the in-depth assessments undertaken by the project.

In order to decide on the demonstration sites and adaptation measures at the village and commune level, the international and national consultants visited the pilot districts, as detailed below.

Saturday 12 June 2010: Visit to Prey Nup District, Sihanoukville Province.

During the morning a meeting was held at the Prey Nup District Office with the following people in attendance:

Name	Abbreviation (in text)	Institutions	Position	Telephone
Mr. Yim Boy		Prey Nup Community	Community Chief	012 49 02 95
Am Ash		Prey Nup Community	Vice Chief Community	097 799 4686
Meas Sarath		Prey Nup Community	Chief Polder	016 409747
Nou Ramy		Prey Nup Community	Executive Director	012 480 0918
Tith Savorn		Prey Nup Community	Chief Polder	016 74 61 39
Veal Savorn		Prey Nup Community	Chief Polder	012 650 713
Tith Vuthy	TV	Prey Nup District	District Governor	012 701235
Jacqui Stephenson	JS		International Consultant	
Chea Leng	CL		National Consultant	012 249798

Minutes:

1. JS, the international consultant, introduced herself and CL and thanked the attendees for meeting on a Saturday. JS introduced a brief background to the project, which the attendees were already aware of (see Appendix D for details regarding other consultations). JS then provided a brief overview on the purpose of the morning's session (i.e. to identify small-scale adaptation measures) and reminded the attendees that the focus of the project's adaptation measures was on protecting productive systems from climate change impacts and improving natural buffer ecosystems to improve protection from SLR, coastal erosion, storms and storm surges.

2. CL introduced the scoring sheets and explained that through this process the attendees would identify the communes most vulnerable to climate change impacts and thus the communes in which the project would pilot its interventions. The attendees were to assign a score (ranging from 1 to 5, with 1 indicating high relevance/vulnerability and 5 indicating low relevance/vulnerability) to each of the 14 communes for each of the criteria listed on the scoring sheet (see example of the scoring sheet below). The communes with the highest scores would thus be determined to be the most vulnerable to climate change impacts.

3. Tith Vuthy (TV) the District Governor (DG) than thanked JS and CL for attending and organizing the meeting. He explained that he had only been the DG for one year and so was not fully aware of the climate-related problems within the district but that he knew his colleagues were and that they were advising him accordingly. TV noted that Prey Nup is very dependent on agriculture as both a source of income and food with 105,000 hectares dedicated to agriculture, most of which supports rice production. In total, there are 86,480 people in Prey Nup living in 14 communes and 65 villages. Agriculture output has been lower in recent years due to less harvesting as crops are frequently damaged by floods. Two types of floods affect the villages and agricultural fields. During the rainy season, Prey Nup is affected by floods caused by heavy rains and during the dry season, the region is affected floods caused by tidal action/storm surges. The region is very low-lying. Approximately, 2.5 – 2.7 t/ha of rice is cultivated per year. There is only one rice harvest each year, which occurs during the rainy season. The farmers and the district officials would like to have two harvests per year but they are hindered by limited irrigation systems, which prevent harvesting during the dry season.

Hence, agriculture is largely dependent rain-fed. During September last year, salt water flooded over the dam that protects a large portion of the rice fields, thereby damaging 50 hectares of the crop. TV would like to see the dam walls built up to prevent this from happening again[134]. In addition, saline intrusion into groundwater resources prevents rice cultivation in parts of Prey Nup.

4. TV also discussed the three communes that exist outside of the polder[135] (i.e. outside of the protective dam), which are subjected to storms every year that occur just prior to harvesting time and thus ruin the crops. Presently, farmers in the area are selecting a new rice variety that that they harvest before the storm occurs. These storms are so severe that they damage people's houses, which need to be tied down. In the past, the elders were able to predict the storm and provide fore-warning because they could hear the storm on the mountains. This allowed 2 – 3 days to prepare for the storm. However, nowadays the storm hits 2 – 3 hours after the elders notice it on the mountain, and thus the communities are not prepared for it. These three communes are very poor.

5. In addition, TV noted that there is little electricity in Prey Nup and nearly 80% of the district's households rely on batteries. Approximately 2,565 households in the district are female-headed and the majority of the region is poverty-stricken and levels of unemployment are high. Such conditions lead to high levels of emigration from the district.

6. Following this introduction to the district by TV, the attendees broke into three groups in order to score the 14 communes against the vulnerability criteria. The process yielded five vulnerable communes, which was then narrowed down to three based on their individual scores. However, TV and some of the other attendees admitted to misunderstanding the vulnerability criteria. For example, they had not taken into account sea water-related flooding for the criterion "vulnerability to flooding". As a result, they didn't fully agree with the three communes chosen through this activity.

7. A discussion was then generated on which communes the attendees felt appropriate for the type of adaptation measures the project aimed to implement (e.g. means to protect agricultural fields from flooding, maintain dykes, improve agricultural output and improve rural livelihoods in the face of climate change). Through the discussions and after visiting the sites identified as vulnerable by the meeting participants, the following activities were identified:

- Plant mangroves along the sides of the dykes in Samaki, Chueng Kor and Toeuk Lark (the three communes that exist outside of the protective polder and are thus highly vulnerable to climate change impacts) in order to stabilize the soils. This would serve to protect the agricultural fields of the communities against flooding events and saline intrusion.
- Dig a fish pond to improve the livelihoods of the communities within Samaki, Chueng Kor and Toeuk Lark.
- Rehabilitate 7km of dyke in Ouk Yha Heng and Toul Tokoeng by increasing the height of the dyke by between 0.4 – 0.7 m. This would benefit 1200 households in the area by protecting their agricultural fields against floods and saline intrusion.
- Improve access to safe drinking water in Prey Nup village and in the Samaki, Chueng Kor and Toeuk Lark communes where the villagers are currently without easy access to safe drinking water because

[134] It is important to note that the government has already set aside money for rehabilitating this dam (implementation date is still to be decided) and so the project will not be contributing directly to this intervention. The project will, however, raise awareness regarding the need to include climate change considerations into development plans and in this way, will likely positively affect this rehabilitation.

[135] A polder is the name given to an area along the coastal zone which is particularly low-lying and thus is affected by tidal action. However, polders are protected by sea water by dykes which have been constructed in these areas.

the wells they dug have become contaminated with salt water. Presently, the purchase water in 30 litre containers for approximately US$1/container, which is considered highly expensive.

- Plant the 'Teap Tus' tree along the dyke in Prey Nup, Ouk Yha Heng and Toul Tokoeng to stabilize the soils and protect agricultural fields against flooding.

Example of one of the scoring sheets completed.

Name of Commune	1. Poverty (e.g. which commune has the highest levels of poverty?)	2. Access to safe drinking water (e.g. Which commune has the worst access to safe drinking water?)	3. Dependence on agriculture (e.g. which communes depend the most agriculture?)	5. Population density (e.g. which commune has the highest population density?)	6. Coastal erosion (e.g. which commune is most vulnerable to coastal erosion?)	7. Vulnerability to floods (e.g. which commune is worst affected by floods?)	8. Incidence of droughts (e.g. which commune is worst affected by drought?)	9. Extent of mangroves (e.g. which commune has the most mangroves?)	Total
Toek Thla	5	1	3	3	2	1	1	2	18
Toek La Ork	5	2	3	2	2	1	1	2	18
Samaki	5	2	3	4	1	1	2	2	20
Cheung Kor	3	3	2	3	1	1	1	2	16
Veal Rinh	2	4	2	1	2	3	3	5	22
Sam Roung	5	3	1	3	2	3	3	5	25
Andoug Thmar	4	3	1	2	1	2	3	5	21
Toul Totoeng	4	3	1	3	1	2	3	5	22
Prey Nup	4	1	1	4	1	1	3	5	20
Ouk Gha Heng	4	4	1	3	1	2	3	3	21
Boeng Taproum	5	4	1	3	3	3	3	1	23
Ou Chronv	2	4	2	2	2	3	3	1	19
Ream	1	3	3	2	2	2	3	1	17
Beit Trang	1	4	2	3	3	3	3	1	20

Sunday 13 June 2010: Visit to Koh Kong District, Koh Kong Province.

During the morning, a meeting was held at the Peam Krasaop Commune Office with the following people in attendance:

Name	Institutions	Position	Telephone
Lar Man	Peam Krasaop Commune	Second Vice Chief	016 32 27 95
Khoem Sanith	Toul Koky Commune	First Vice Chief	097 800 800
Kim Sokhei	Toul Koky Commune	Chief Commune	097 5862107
Yem Yan	Peam Krasaop Community	Vice Chief Community	016 633767
Chey Picrotana	Department of Environment	Director	016 70 25 41
Chey Yoen	Village 2	Villager Leader	097 74 91994
Chut Tit	Peam Krasaop Commune	Chief Commune	
Jacqui Stephenson		International Consultant	
Chea Leng		National Consultant	012 249798
Seng Sinath	Village 1	Vice Chief Village Leader	016 713995
Nouy Leng	Village 1	Chief Village Leader	016 774 759
Siak Chea Bun	Village 2	Vice Chief Leader	016 469152
Neang Kun	Peam Krasaop Commune	First Vice Chief Commune	016 469152

Minutes:

1. JS greeted the attendees and introduced the reasons why herself and CL were there that morning and thanked the attendees for meeting on a Sunday. JS provided a brief background to the project and explained how the morning would work. The attendees were to be split into two groups - a group related to agriculture and a group related to the mangroves and within their groups, they would complete a questionnaire related to their topic.

2. CL explained the questionnaire (see below) which asked questions to ascertain the climate-related problems experienced in the agriculture sector and affecting the mangroves, which would lead to the identification of vulnerable areas and specific adaptation measures required. Once the questionnaire was completed, the group would then report back.

3. The mangrove group identified the following interventions:

- Replanting of mangroves in Prek 1, 2 and Prek Soch of 30 hectares to improve the coastal buffer systems against storms.
- Planting of pine trees (Casuarina species) of Peam Krasaop beach to protect the Old Peam Krasaop Village from violent storms and to stabilize the beach sand to prevent further coastal erosion (which is negatively impacting on the mangroves). Presently, the village has little protection from storms and thus are very badly affected by them (infrastructure falls into the estuary, for example).

4. The agriculture group identified the following interventions:

- Deepen the natural dam near the Toul Ki Kroum Village (and raise the walls) in order to provide water for 120 households for both domestic (e.g. agriculture and cattle) and household (e.g. cooking, washing and drinking) purposes. This will allow communities to capitalize on heavier rains as a result of climate change and to have access to water during the dry season. The dam has an area of 875 m^2 but is presently very shallow (less than 1 m) and has an island of soil in the middle.

5. Other interventions identified during the discussions:

- Rehabilitate the road between Koh Chark village and the main road. The road is flooded at least twice a year (once during the rainy season as a result of heavy rainfall and once during the dry season as a result of tidal action/storm surges). These floods have become more severe in recent months and the community in Koh Chark village is being isolated and trapped by the floods to the point where the children are unable to get to school and the villagers cannot escape heavy flooding episodes. The road is 3km in length and needs to be increased by approximately 0.7 m (using soils from either side of the road, to further protect the road) in order to allow the community to use the road during the floods. This is the only road that links this community with the main road and other areas.
- Construct a dyke of approximately 2.3 km to protect agricultural fields in the Toul Ki Kroum Village from increased flooding from heavy rains and storm surge/tidal action-induced floods. This will benefit approximately 120 households.

6. After the meeting, CL and JS were taken to see the mangrove area in Koh Kong District and to see the agricultural area surrounding Toul Ki Kroum Village.

Group 1: Discussion on mangroves

1. How should the project protect the mangroves?	- Re-plant mangrove (e.g. in Prek1, 2 and Prek Soch, which amounts to a total of 30ha) - Patrol the mangroves to prevent illegal harvesting - Educate people to improve awareness on the advantage of intact mangroves
2. How can the project ensure sustainable harvesting of the mangroves?	- Establish a system whereby people need to get permission before they harvest the mangroves - Zone mangroves to identify areas for community use
3. Is it necessary to teach the people on the importance of mangroves in Peam Krasaop?	- Undertake training to improve the awareness of mangrove ecosystem
4. How will the project ensure community participation?	- Provide an incentive to community members - Educate
5. Is there a need to restock fish and crab in the mangroves?	- Yes, there is a need to stock fish and crab in the mangrove ecosystem
6. If so, where would the project get the fish/crabs from?	- Contact the department of fishery
7. What other projects are currently operating regarding the mangroves?	- UNDP (6 months more will be finished) - IUCN (Will be finished soon, and focus on the research) - IDRC (Almost finished soon, and focus on the research)
8. How will the mangroves be rehabilitated?	- Encourage community members to participant in the replant of the mangroves - Conservation

9. Identify the two most vulnerable coastal protection ecosystems which require rehabilitation.	- Peam Krasaop Beach - Bang Kayark (Village 1 and 2)
11. Is it necessary to plant trees behind the mangroves and why?	- Yes, it is necessary to grow the trees behind the replanted mangroves (to protect them from storm and utilize as a fuel wood)

Group 2: Discussion on agriculture

1. Where are the agricultural areas most vulnerable to climate-related impacts?	- Koh chark, Tachark, and Toul ki Kroum Village (sea water intrusion to rice field)
2. What are the climate-related problems?	- Loss mangrove trees, sea water intrusion to rice field and drought
3. How can this project help to protect agricultural output against floods/sea-level intrusion/droughts etc?	- Constructing dyke (approximately 2,300 m in length) - Training farmers on implementing 'multiple agriculture' systems (e.g. diversifying from rice farming to also include cattle farming and vegetable growing in order to diversify livelihoods in the face of climate change) - Improve access to safe drinking water (e.g. deepen the natural pond near Toul ki Kroum Village). This will also improve access to water for other purposes such as irrigation, washing and cooking in face of climate change. The area of the pond is $875m^2$. However, it is very shallow and contains a small sand island in the middle which should be removed to enhance its water carrying capacity. By deepening it to collect more water, this would support 120 households in the area)
4. What are the current protection mechanisms?	- A dyke to protect agricultural fields from sea water was constructed in Toul koki groum. However, there two more villages in which a dyke has not yet been constructed.
5. What other projects are working on projecting agricultural output in this area?	- SGP-UNDP will be constructing a dyke 2,300m (mentioned above)
6. What could be done to improve livelihoods in the vulnerable agricultural areas?	- Planting mangrove to improve the mangrove ecosystem - Improve multiple agriculture sector (family training) - Training (career)

Appendix 19: Summary of consultations held

MINISTRIES AND NATIONAL COMMITTEE FOR DISASTER MANAGEMENT (NCDM)

Ministry of Agriculture, Forestry and Fishery (MAFF)

Ministry of Agriculture, Forestry and Fishery (MAFF) informed the team about its projects and activities along the coastal zones of the country, also highlighting the importance it currently gives to issues related to climate change. On this subject, the Ministry also submitted project proposals to various donors/development partners (EC, Japan, and UNDP), but had no success in securing funds.

The issue of funding availability was raised on several occasions; the Ministry also requested whether, through the CCCA project, NCCC or through other means, this financial support could be provided.

While discussing country vulnerabilities, MAFF noted that Kampong Thom Province would be in need of assistance, due to floods and droughts disasters.

Forestry administration representative commented on the work on two pilot sites on community forestry in Odor Meanchey and Mondulkiri Provinces, as part of REDD progress in Cambodia. It was reinforced that the most urgent impacts of climate change within the coastal zones are storms, floods and SLR – with increasing storms and floods already threatening the coasts. This is in line with the approach of the project, which will not only focus on SLR but will also cover other more immediate impacts of climate change.

The Agriculture directorate informed that the current MAFF policy acts to enhance food security in the country by increasing the production by use of bio-fertilizers and modern technology, while not expanding the area of the agriculture, thereby increasing deforestation. Diminishing soil quality within the coastal zone due to floods and soil intrusion, were also noted. No current projects/activities are being implemented within the coastal zones; however the directorate showed an interest for future potential collaboration with the project.

Some mangrove protection and replantation activities are being undertaken by the Fisheries directorate with local communities. With regards to facilities in the coastal provinces, MAFF highlighted the presence of the Fishery Research Centre, in Sihanoukville Province, funded by Japan.

Overall, MAFF welcomed the project and confirmed that it would be highly interested in cooperation and active participation in its implementation. The ministry also reinforced that provincial authorities and local communities should be amongst the targets of the project.

Ministry of Industry, Mines and Energy (MIME)

Ministry has some focal work on climate change mitigation and consultations revealed potential points of collaboration, cooperation and education. MIME has a long history of renewable energy and energy efficiency, promotion. Despite the past ten years of work on the field of renewable energy, no law recognising renewable energy and energy efficiency has been passed.

Among the projects on renewable energy, which is worthy to follow up on and further discuss, is the plantation of *Lucana* sp. in the back mangrove areas in selected coastal localities. This species is a fast growing, providing a sustainable source of livelihood for the local population with regards to fuel wood, furniture production, railways projects, etc. The experience gained on this project, could be highly valuable for potential replication in the project. The Ministry showed sincere interest in further detailed discussions on this approach both as a learning opportunity for the project as well as potential ways of cooperation. The Ministry reinforced the importance of capacity building in government as an essential process for effective implementation of the project.

Ministry of Land Management Urban Planning and Construction (MLMUPC)

Ministry of Land Management Urban Planning and Construction (MLMUPC) discussed the action plan developed in collaboration with Japan International Cooperation Agency (JICA), and Danish International Development Agency (Danida). The worked focused on community land use planning in ten target areas including three coastal provinces, Kep, Koh Kong, and Sihanouk and will expand to Kampot in 2010. Natural resource management maps and land use maps were also produced at the local level. At the provincial level, MLMUPC produced maps of sensitive or hot spot areas that should be protected from development. Local officers will be trained on utility of land use maps in the planning process.

Two more, JICA funded, relevant projects, had been cited, the National Strategy on Coastal Zone Sustainable Development and the master plan in Sihanoukville Province including the urban land use and flood control. The projects, started on March 2009, will extend until July 2010.

The MLMUPC mentioned that predictions regarding climate change impacts, including SLR, were very urgently needed in relation to their planning efforts and zoning within the coastal zone. MLMUPC expressed its interest in collaborating with UNEP for the development and implementation of the CCCA project.

Ministry of Environment (MoE)

The Government of Cambodia mandated the Ministry of Environment (MoE) to supervise and coordinate climate change mitigation and adaptation efforts in Cambodia and to provide, through its climate change Department, Secretariat support to the National climate change Committee (NCCC) which is chaired by Senior Minister, Minister of Environment. Prime Minister Samdech Hun Sen accepted the Honorary Chair position of the NCCC in late 2009, which enhances the committee's status. The climate change Office was established in 2003 and was expanded to become the climate change Department (CCD) at the end of 2009 under umbrella of MoE. Under the SNC, MoE has been conducting a vulnerability and adaptation assessment of different sectors, such as agriculture, water resources, forest and health care.

The ministry reinforced the importance of working in close collaboration with the climate change Department, and welcomed the representation of CCD in the project formulation team, encouraging the acceptance of this approach throughout the formulation and implementation of the project. More importantly, MoE stressed that the participation of the government had to be an active one, and welcomed the aspects of learning-by-doing of the project.

MoE appreciated the progress being made for the formulation of the project, strongly supported the formulation mission and wished that the project could start as soon as possible, and could deliver tangible results to the country.

Beyond the comments on the project, MoE noted that both the line ministries and national stakeholders have to improve their coordination, in conjunction with the donors, and the international organizations. In this framework, the Ministry highly welcomed CCCA and PPCR initiatives – encouraging enhanced linkages between the two.

Ministry of Health (MoH)

MoH operates all across the provinces of Cambodia, and whilst climate change is a relatively new topic for the Ministry, many climate change impacts have affected human health (waterborne disease, diarrhoeas, etc). The MoH expressed its interest and potential support to the project.

Ministry of Public Work and Transportation (MPWT)

Ministry of Public Work and Transportation (MPWT) is responsible for the construction of road and port infrastructure. MPWT constructed the Asian highways one to three, and the Asian highway named the QS corridor South-west that connects Ho Chi Minh, Phnom Penh and Bangkok cities along the Asian highway 1. The MPWT showed concerns about the wastewater management and discharge in to the sea in coastal provinces. Recently, the MPWT prepared a five year master plan for roads and

ports, which concentrates on agricultural and industrial development, and also gathers information from the Council for the Development of Cambodia (CDC), and key ministries. Climate change issues are however not considered in all MPWT master plans (roads, ports and wastewater). The MPWT informed that in order to implement and include climate change adaptation activities, additional funds would be needed. The MPWT asked for support on guidelines and procedures on how to apply international funds on climate change.

MPWT have showed an interest in the project. within the coastal zone provinces, the MPWT constructed the wastewater management (separate sewers and rain drainage) in Sihanoukville Province with the use of ADB loans in 2006. Additionally, MPWT is starting a feasibility study on wastewater management in Kep province with a Korean loan, and an environmental master plan on wastewater management, water supply, air quality and solid waste in Phnom Penh, Siem Reap, and Sihanoukville.

Ministry of Rural Development (MRD)

The Ministry of Rural Development (MRD) is responsible for small scale water supply to households (drilling well, digging well, and pond); health care; and infrastructure (road, bridge, pipes, etc.) in the rural regions of Cambodia.

MRD recognizes the importance of climate change adaptation, as climate change related events such as storms, floods and droughts, SLR, are clear evidence. Consequently climate change impacts different sectors including: agriculture; households; infrastructure (rural roads); water; and drainage system. In this framework, MRD reported three planned projects: Rural Water Supply, Rural Road and Infrastructure, ethnic minority development.

MRD submitted three proposals to the NCCC that considered the: 1.) reduction of diseases; 2.) improvement of water supply; and 3.) improvement of rural roads. The Ministry also highlighted the importance of international organizations and donors to provide grants, and not loans, for the enhanced development of Cambodia.

Ministry of Water Resources and Meteorology (MoWRAM)

Ministry of Water Resources and Meteorology (MoWRAM) is responsible for managing all activities related to water and meteorology development and natural disasters. From 2004 to 2008, MWRM has implemented the Rehabilitation of Irrigation Infrastructure, Drought Intervention, Flood Mitigation and Management, Hydrology and Meteorological Basic Information System, and Human Resource Development. In this period, MWRM has managed and mitigated flood and sea water damage, through the rehabilitation of seven flood protection dams, which potentially protect 130,799 hectares of crop land, and six polders, which potentially protect 14,328 hectares of crop land.

In addition, from 2009 to 2013, MWRM is responsible for sustainable economic and social development of Cambodia's water resources, in the provision of water for agricultural production, hydropower, fisheries, navigation and tourism.

MoWRAM developed an action plan for water resources and meteorology management and development that includes: water resources management and development; flood and drought management; the promotion of a draft of law, regulation and water development; water resources and meteorology information management; and the improvement of administration management and human resources development. This action plan also includes preparedness for the disaster risk reduction (storms, tsunamis and floods) and climate change adaptation.

To undertake the above efforts, the MWRM has been supported by a number of development partners such as JICA, AFD, UNDP, FAO, KOICA, ADB, WB, IFAD, Japan, France, India, China, Republic of Korea, etc.

The Ministry welcomed the project and it is interested in further collaboration during the formulation and implementation phase.

National Committee for Disaster Management (NCDM)
The National Committee for Disaster Management (NCDM) is an inter-ministerial body chaired by the Prime Minister. The members of the committee are drawn from all concerned ministries and the armed forces. NCDM plays a key role in disaster management, working both on disaster risk reduction/prevention and response preparedness.

Among existing NCDM activities, the assessment of the vulnerability of local communities to a natural disasters and their resilience, might provide relevant information to the project. The project was undertaken for Kampot and Sihanoukville Provinces in collaboration with ISDR and ADPC and an English publication will be made available to the team. Further vulnerability assessments and climate change adaptation could not be completed because of lack of funding.

NDMC also extensively worked to enhance communes' capacities in integrating DRR and preparedness concepts in commune planning. In Prey Nup district, DRR concepts have been successfully included into the planning.

NCDM confirmed that coastal zone areas in Cambodia are still lacking warning systems; the fact that fishermen do not have neither radio/TV make the situation worse since alert messages cannot reach them neither through those means.

The committee recognize the relevant impacts caused by climate change (e.g. sea level rise and increase in temperature) that affect to coastal paddy cultivations, households, and livelihood overall. NCDM informed that vulnerability or risk maps for coastal zones do not exist yet, and therefore the related outputs of the project will be highly beneficial. The NCDM mentioned that information/prediction regarding climate change impacts including sea level rise was very urgently needed in relation to their planning efforts including zoning within the coastal zone.

NCDM highly welcome the project and stands still for potential cooperation in implementation phase. NCDM recommends a very quick start in the implementation.

CAMBODIAN CLIMATE CHANGE ALLIANCE PARTNERS

Danish International Development Agency (Danida)
Danida was already well informed about the project details and it as integral part of the CCCA, representing its grant project 1 on adaptation within the coastal zones. Basing on the lessons learned from, and the decennial experience of, the Danida funded the UNEP-DHI Centre coastal zone projects, Danida highlighted the importance of this project and the added value it gives also to the CCCA. Danida highly welcomed this project, which can provide also important synergies and follow up of the previous work undertaken within the coastal zones. In the view of the Danish International Development Agency, the project should start as soon as possible.

Danida reinforced the importance of implementing the project actively involving provincial authorities, attempting not only at delivering tangible results but at changing their mindsets.

Recommendations were also given for the project to consider linkages with DRR work within the coastal zones, such for example, early warning systems, some work which was also previously attempted by Danida. While the focus of the project should not be shifted to DRR, a close collaboration of the project with NDMC was highly recommended.

The commune land use planning maps prepared through past Danida supported projects would represent a support to the project and Danida will soon share them with the team.

In addition to its contributions to the CCCA, Danida is also providing, until December 2010, direct support for capacity building of the MoE and the CCD. Funds are also provided to UNDP and Oxfam for work related to indigenous knowledge. Danida is working closely in relation to D&D, and its portfolio is focusing on fisheries and community forestry. For the period 2011-2016 Danida will provide 40 million USD for natural resource management in Kampot, Kep provinces and Eastern part of the country. Koh Kong will remain a target area of Danida for 2010, but will not be from 2011 onwards.

Danida informed that additional funds specific for implementation of CC activities/projects are not foreseen, since the new policy of Danida would be more on environmental management with climate change concepts mainstreamed (more than pure CC projects)

With regards to overall UNEP presence in the country, and a more effective implementation of the project, Danida highlighted the importance of allocating a UNEP staff in the country for the implementation of the project. Basing on experiences from other countries UNEP is indeed interested to recruit a national officer, and it is currently looking posts requirements across the region to prioritize countries.

European Union (EU) – Delegation of the European Commission (EC)
The EC was already well informed about the project details and it as integral part of the CCCA, representing its grant project 1 on adaptation within the coastal zones. The EC reinforced the importance of formulating and implementing the project under the overall framework of the CCCA and contributing to its overall objective and mandate.

The experience cumulated during the past ten years by the UNEP-DHI Centre's projects, and other activities, within the coastal zones should be used as important lessons learned and base for the project of the CCCA. EC recommended capturing all this experience and using it for policy making and potential replication in other areas.

EC recommended a prompt start of the project, which could provide useful lessons learned also for the overall implementation of the CCCA. EC confirmed that the additional funds from the GEF would not be a requirement for disbursement of the CCCA funds and would welcome a prompt implementation of the project. While the multi-donor trust fund is administrated by UNDP, the decisions on disbursements are taken by all the partners. EC indicated however that the submission of an implementation plan and budget would be requirement for the funds disbursement. A full project document specifically for CCCA would not be required, since the project is already integrated in the CCCA programme document.

EC informed the team that it would be important to deliver the project within the first three years of the CCCA. UNEP confirmed that the completion report of the project under the CCCA would be submitted within the expected time and that, only selected outputs directly funded through the additional GEF budget, would be carried on for the fourth year.

In addition to the funds allocated for the CCCA, EC is also providing funds to FAO on food security in two coastal zone provinces (Kampot and Kep), and it is supporting ongoing renewable energy project in Sihanouk province.

Swedish International Development Agency (SIDA)
SIDA confirmed that it highly welcomes the project and considers it as integral part of the CCCA, representing its grant project 1 on adaptation within the coastal zones. SIDA welcomed the long experience of the UNEP-DHI Centre on coastal zone management in Cambodia, which would provide a good basis and lesson learnt for the implementation of the project. The reaching out of the project to provincial and community level of this project was also highly appreciated. It was suggested that the project could work also establishing linkages with DRR and, especially, early warning systems.

SIDA reinforced the message that CCCA funds are available for the project to start immediately, allowing to start providing tangible results to the country and to provide lessons learned for the overall implementation of the CCCA. In terms of disbursement of the funds, SIDA informed that, once the CCCA partners approve, the funds should be made immediately available to the project.

SIDA also confirmed that, depending on the success of the first three years of CCCA, it is intentioned to allocate more funds in the multi donor trust fund. SIDA confirmed that the trust fund should be an open fund, accessible to all and that after the first three year of UNDP administration, it should be handed to the government.

In the choice of the project site, SIDA recommended to pay particular attention to conflict resolution among different communes. In term of saving time and enhancing the project smooth implementation, SIDA suggested to utilize the existing communities link with other projects in coastal zones.

In addition to the CCCA, SIDA programme in Cambodia has three main focus areas: governance support to decentralization, education, human right.

SIDA also welcomed the potential linkages of this project with other on-going initiatives for example the SIDA funded Adaptation Knowledge Platform (AIT/RRCAP UNEP, SENSA, SEI, UNEP) and the Mangroves for the Future initiative.

United Nations Development Programme (UNDP)
UNDP provided an update on the progress of the CCCA initiative, in terms of signature of the CCCA document from the government side (Cambodian Development Council) and launch arrangements (tentatively scheduled for February 25th). UNDP also informed about the recruitment of an interim coordinator of the CCCA national Support Programme project, who should be on board in two weeks time.

With regards to the project, UNDP showed uncertainties on the modality of approval. In the view of UNDP the disbursement of the funds for the project should be endorsed by the Programme Support Board (PSB), which will however probably, be established only after March.

In addition to the work planned within the CCCA, UNDP was requested by the Ministry of finance to support the Pilot Project on Climate Resilience (PPCR) phase I (enabling environment). In this framework UNDP is preparing a network of technical climate change focal points in all the ministries. Seminars and consultations on climate change will be undertaken every day in the week 9-12 February. The draft of the PPCR phase I will be ready by Mid March.

UNDP also supports livelihood projects, integrated water management project, DRR and gender in Koh Kong province. While UNDP has no substantial project planned for coastal zones in Cambodia, it indicated that the UNDP work on D&D might provide good information for the formulation and implementation of the project of CCCA.

PROVINCIAL GOVERNMENT

Koh Kong Provincial Authority
Koh Kong coastal length (221 km) represents half of the total coastal zones in Cambodia (435 km length).

Problems of inundation and salt intrusion in freshwater have been experienced, with 5000 ha of rice damaged last year. Climate change projections in this province estimate a rise in sea level of 0.5 m to 1 m in next 50 years, basing on which nearly half of the Koh Kong would be inundated. Koh Kong authority gives high importance to climate change issues and it is seeking fund to adaptation and mitigation, for example through research on climate resistant crops and through construction of dykes

Among the coastal activities of relevance for the CCCA project, the authorities informed on the FAO funded Fishery provincial department efforts in technical training course on aquaculture (fish, and crabs) to local people. Danida is also supporting fishery and forestry projects in this province until the end of 2010. One dyke, 4 km length, is under constructing at Thma Sar commune to protect the seawater and freshwater which utilize government budget.

The provincial authority of Koh Kong highly welcomes the project and look forward for its prompt implementation through active participation of the local government.

Sihanoukville Provincial Authority
A full briefing of the CCCA initiative and on its project was delivered to the provincial authority. The team also clarified on causes and impacts of climate change within the coastal zones. The Provincial Authority appreciated the Danida funded the UNEP-DHI Centre coastal zone management projects implemented in the previous years, and in the same way highly welcomed the current CCCA project. The authority of Sihanoukville will would provide full cooperation and assistance for the implementation of the project.

The authority informed about the importance of focusing on other areas in Stueng Hay district, where fishermen have been affected by storm.

Among various problems reported, the province suffers with problems related to storms, sea level rise and sea intrusion in rice field areas. The areas of Prey Nup (in special reference to Taklá and Ream communes) and Ocheurtil were indicated as areas of high vulnerability.

Impacts of climate change are already visible in Sihanoukville, and according to Provincial Department of Environment, the sea level rise has continually increased in the last few years which affected to people who live in the Sammaki commune and it affected 10,000 ha of rice field.
Last year, 70 ha of rice field were damaged by salt intrusion and additional 176 ha were indirectly impacted in Prey Nob. A reduction in rice harvesting in comparison to previous years, mainly due to inadequate irrigation system, was also noted. Kompong Seila district also shows important problems related to rice harvesting, due to a lack of effective water irrigation system.

Some of the past activities implemented in the province, such as the mangrove replanting led by the Fishery Provincial Department in 2006 and the Danida work in support of 15 communities to protect seagrass and coral reef, might provide useful information for the project.

Support from bilateral donors and international organizations was received in the past, such as the AFD work on construction of dykes in Prey Nup; the FAO support for planning develop water resource, reservoir repairing, and irrigation system in Prey Nob and Kompong Sela district (part of the fishery livelihood programme of FAO for Cambodia, 2.4 mill USD); training for local communities on shrimps aquaculture and crabs cultivation; strengthening natural resources, fishery communities and enhancing reforest station.

INTERNATIONAL ORGANIZATIONS, BILATERAL AND MULTILATERAL DONORS

Asian Development Bank (ADB)
ADB divide its work in Cambodia in country operations and GMS sub regional programme.
Under the country operations, ADB has been active in Tonle Sap basin since 2005, and works on climate change related issues, in the specific: i) water and agriculture sector adaptation, ii) transport, iii) renewable energy.

The GMS sub regional programme, through which ADB also work in some extent in coastal zones in Cambodia, supported MoE in the GMS countries on issue related to environmental sustainability promoting biodiversity corridors; in Cambodia these activities have been implemented in Koh Khong province.

The project on "flood and drought management" currently under preparation in ADB Headquarter is worth following up for its potential linkages to the CCCA project, or for the potential information this project could provide to the project. Midterm review of the project preparation is planned for March/April 2010. Start of activities of this project are planned for 2012

The Pilot Programme on Climate Resilience (PPCR) is definitely among the most relevant ADB initiatives on climate change. In Cambodia (the only Southeast Asia pilot country for the initiative) PPCR is collaboration between ADB, the World Bank (WB), International Finance Corporation (IFC) and the United Nations Development Programme (UNDP). A scoping/formulation mission was undertaken in October 2009 and now the partners are working at the phase I, enabling environment, for a total duration of 6 months. The budget for Phase II, real implementation phase of the initiative, sum up to 30 – 60 million USD, with funds to be committed before 2012. While the initiative is focusing on agriculture, water and rural infrastructure, activities in coastal zones have not been completely excluded. Geographical focus of the initiative is still under discussion. Roles and responsibilities of the partners have been divided as follows: ADB, focus on water and infrastructure (the flood and drought management under preparation might be integrated into the initiative); WB, agriculture; IFC, private sector; UNDP, capacity building.

ADB is aware of the CCCA and would highly recommend a close cooperation and link between CCCA and PPCR in Cambodia. In this framework, ADB also recognize that the work to be started soon under the CCCA, including the project, could represent very valuable baseline for PPCR. ADB also informed that the project could approach PPCR for investment funds if such needs are identified during the adaptation planning phase within the coastal zone.

UNEP also briefed the ADB Cambodia office about the overall UNEP Regional Office for Asia and the Pacific and ADB Headquarter current discussions on collaboration in the implementation of the Asia Pacific Adaptation Network.

Agency France de Development (AFD)
AFD informed that it was not involved in new activities within the coastal zone. However a system has been established between Ministry of Finance, MoWRAM and local communities for maintaining the previously constructed dyke system in Prey Nup. The agricultural area has been increased from 4500 ha to 10.000 ha and the rice production per ha from 1 ton to 2-4 tons. Approximately 200,000 € was provided by MOF yearly for maintaining the system. Part of the maintenance also included replanting of mangroves.

AFD supports to the CCCA project also for the project potential work on conservation/rehabilitation/management of mangrove forest in the areas were dyke systems were put in place. This work could in fact add value, and enhance the life duration of the dyke system, protecting it through shelterbelts from wave, water current, wind and storm.

In the current and future plans AFD is not including budget for coastal zones or for direct climate change interventions. However some of their projects, such as the agriculture development support (PADAC project) would indirectly contribute to increased adaptation to climate change.

Food and Agriculture Organization (FAO)
FAO provides important support to Cambodia in fishery and agriculture. Current FAO portfolio in the country related to the CCCA project consist of:

1. Fishery livelihood programme, working on community fishery capacity to use natural resources in four provinces (Kampong, Kep, Koh Kong and Sihanoukville). This regional project (Sep 2009 – 2013) is being implemented in Cambodia, Indonesia, East Timor, Sri Lanka and the Philippines, through funds of the government of Spain, in the measure of 20 mill USD regional project and 2.4 mill USD for Cambodia only. Detailed information on the project will be shared electronically with

the mission team, however the main outputs will be in the areas of: i) safety at sea (small scale fisheries); ii) fishery and technology improvement for fish processing and marketing; iii) alternative livelihood; iv) capacity building on revolving funds and microfinance.
In Cambodia the project recently had its inception workshop and it is working at the preparation of the baseline information for each of the outputs areas, which will take tentatively six months.

2. FAO also works on NFP facility supporting the technical working group of forestry administration for formulation of national level program. The document is waiting for official endorsement from the government. This project contains six subprograms, such as forestry market, forest administration and conservation, forest law enforcement, committee forestry, quality research and capacity building, and finance.

3. From the forestry aspect, FAO is also supporting the technical working group on forestry and environment, building capacity government officer and community forestry to protect or concern of the forest in carbon trade. In addition, Cambodia has been recently included among the next potential countries to enter the UN-REDD initiative. In this framework FAO is working with the government of Cambodia (MAFF) for the UN-REDD preparedness.

4. FAO is currently working at the preparation of a project proposal on enhancement of adapted agriculture methodology to mitigate impacts of climate change. Once developed, FAO would be interested of submitting this concept note to the CCCA. This future project could represent a valuable linkage between FAO and the project work.

FAO welcomes and looks forward for the beginning of the implementation of the project, and stands available for potential cooperation.

World Health Organization (WHO)
While not working specifically on the coastal zones of Cambodia, WHO briefed the team on the action plan for "climate change and health", collaboration between WHO, the Ministry of Health and an Australian university. The desktop study which is currently being finalized, reports on vulnerabilities of Cambodia in the following areas: i) vector born diseases and climate change (e.g. malaria, dengue, etc); ii) water and sanitation; iii) extreme weather events and health (e.g. drought effect on the medical sector); iv) food security and health. The report also include adaptation plan for the health sector in the four mention areas.

WHO welcomed the project and would stand available for potential cooperation.

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Vulnerability Assessment and Adaptation Programme for Climate Change within the coastal zone of Cambodia Considering Livelihood Improve and Ecosystems.

FORMULATION MISSION DEBRIEFING TO CCCA PARTNERS
Feb 12, 2010 Office of the European Commission, Phnom Penh, Cambodia

Agenda
1. Brief presentation on the CCCA coastal component
2. Overview of the formulation mission and its results
3. Open discussion
4. Conclusions and way forward

List of Participants

1.	Mr. Koen Everaert	Attaché Cooperation, EU
2.	Mr. Andrew Mears	Advisor, UNDP
3.	Mrs. Dor Soma	Programme Officer, Sida
4.	Mr. Jacob Jepsen	Counselor, Danida
5.	Mr. Lic Vuthy	Program Staff, Danida
6.	Dr. Jens Erik Lyngby,	Team leader, UNEP-DHI
7.	Mrs. Serena Fortuna	UNEP-ROAP
8.	Mr. Vann Monyneath	Deputy Director General, MoE
9.	Mr. Yem Dararath	National Consultant
10.	Mr. Chea Leng	National Consultant

Absent

1.	Mr. Chea Chan Thou	Deputy Director, Climate Change Department, MoE

Summary of discussions
Mr. Koen Everaert opened the meeting welcoming all participants and handed over the floor to Dr. Jens Erik Lyngby to brief on the results of the mission. Mr Vann Monyneath apologized for the absence of the Mr Chea Chan Thou (CCD representative and CCCA coastal component team member) who was unable to attend due to a conflicting schedule.

Brief presentation on the project and overview of the formulation mission and its results

Dr. Jens Erik Lyngby reminded the CCCA partners that the mission for the formulation of the coastal component programme[136] started on January 25 2010 for 3 weeks, with the main aim of consulting with the key stakeholders including meetings with key ministries of the NCCC, partners of the CCCA, other bilateral donors and organizations of relevance for coastal areas in the country, both at national level and at provincial level in the two potential target sites of the component, Sihanoukville and Koh Kong (two of the coastal provinces in Cambodia most vulnerable to sea level rise and extreme weather events).

Dr Lyngby also briefly reminded the partners of the purpose of the project, which, while implemented in full accordance with and contributing to the overall goal and structure of the CCCA, would focus on capacity building at national and provincial level regarding adaptation within the coastal zone, vulnerability assessment and participatory adaptation planning for the coastal area and demonstration of adaptation measures implemented in high risk agriculture areas and natural ecosystems within the coastal zone. In this framework, Dr Lyngby also briefed on the main coastal issues in Cambodia and on few ongoing climate change activities along the coasts of the country for future potential collaboration.

[136] The coastal component programme is the name given to the document developed in order to apply for CCCA funding. Hence it contains the same information as this project document.

The formulation mission confirmed that at the national and particularly at the provincial level, capacity building related to climate change in general is still an important need. Financial support was also highlighted by the majority of the stakeholders as a crucial issue to mainstream climate change into their activities.

Through the extensive consultations undertaken, the team also confirmed that all the key ministries, NCDM and the two provincial authorities highly support the project and look forward to its implementation.

Open discussion

Mr. Jacob Jepsen thanked Dr Lyngby for the briefing and for the work undertaken and confirmed that Danida supports the projecton. Mr Jepsen also reminded the importance of anchoring the project in the most appropriate ministries and departments, to ensure an effective government ownership and involvement in the process.

The project could provide a good example and support for the initiation of the CCCA programme, and also provide lessons learned for the CCCA's future activities and components.

Mr Jepsen expressed a general concern about the CCCA, bringing the attention of all the partners to the harmonization of all the different components/activities of the CCCA.

Also, he highlighted the importance and need for CCCA to support the overall national D&D efforts. In this framework, Danida suggested the project team and all the partners rethink the programmes prepared and explore whether linkages with the D&D could be established. The other partners agreed on with importance of the D&D.

UNDP and other partners raised the point that it is of considerable importance for the project to work in collaboration with government departments who have the technical skills and/or plans for undertaking similar activities (such as CCD, which could contribute to the vulnerability assessments, in particular, to be undertaken by the project). The project team, which includes CCD, confirmed that the project has been designed as highly participatory, and with an important approach on "learning by doing".

With regards to CCCA fund disbursement, UNDP as administrator of the trust-fund, informed that the agency is working to facilitate the process and also to facilitate the preparation of the co-funding letter to be submitted for the additional GEF funds. UNDP would update on progress in these two fronts in the next weeks. EC confirmed that UNDP will be able to find a solution for the quick disbursement of the CCCA funds to UNEP for the prompt beginning of the activities. This possibility may reside in the flexibility of the CCCA contract for the first six months after its signature.

UNDP also highlighted the unresolved issue of the salary supplementation, which might affect the time and ability to deliver the overall CCCA programme.

UNDP also provided a quick update on the progress of their work with the PPCR and how the CCCA is providing its enabling environment. CCCA has the capacity of moving fast, in piloting and sharing lessons learned, which would also be of benefit to the PPCR. UNDP further highlighted the importance of creating connections with other on-going/planned activities, such as the Cambodia plans of the SEI/SENSA/UNEP/UNEP-AIT-RRC.AP "Adaptation Knowledge Platform for Asia" and the soon to be launched UNDP agriculture project.

Mr Koen Everaert expressed that it would have been useful to meet with WB too. Mr Everaert confirmed their appreciation for the project, and the ten years history of work in the coastal area of the country, the lessons learned and experiences that could be brought from there. He reminded that the CCCA partners from the beginning looked at this programme as a potential "quick start" of the CCCA

activities and welcomed the suggested inception date as April 1st. Mr Everaert, however, reminded of the importance of the project contributing to the overall CCCA goal and of it delivering tangible results after next three years.

Mrs Dor Soma welcomed the results of the formulation mission and the potential initiation of the coastal component programme on the suggested date of April 1st. Mrs Soma importantly noted the importance of coordinating and merging the coastal component programme milestones with the overall CCCA milestones and programmes. In this framework, Mrs Soma was interested in the potential participants of the consultation workshop planned by the coastal component for mid March. In response, the mission clarified that key ministries of NCCC, NCDM, key provincial level, Development Partners (DPs), UN and international organizations as well as NGO officers would be invited.

Conclusions and way forward

The main conclusions points and way forward are reported below:

- All partners agreed that the project should start its activities as soon as possible, and welcomed the suggested start date of April 1st (if related CCCA funds will be approved/disbursed by that date).
- To disburse the CCCA funds, agreement between EC, Danida, SIDA, UNDP and MoE would be sufficient; there will be no need of waiting for the put in place of the full board, since this would significantly delay the beginning of the operations of the coastal component and - overall - of the CCCA.
- UNDP will work to solve the administrative issues to promptly disburse the funds for the implementation of the coastal component programme and to sign the co-funding letter needed to secure GEF funding.
- It was agreed that, in order to approve the budget disbursement, UNEP should submit the budget and annual work plan. A component document should also be submitted but would not be a requirement for initial budget disbursement.
- UNEP agreed to identify activities and results that could be delivered in the 3 years timeframe requested by the EC.
- The project will be implemented in the framework of and will contribute to the overall goals and objectives of the CCCA and, as much as possible, contribute to the D&D work in the country.
- The milestones and the agenda for the NCCC briefing (22 Feb) of the CCCA will be revised to include the project's milestones. During the NCCC briefing, and in the framework of the description of the overall CCCA, MoE will report on the project.

The meeting was closed at 11:17 hr.

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FORMULATION MISSION DEBRIEFING TO THE MINISTRY OF ENVIRONMENT
Feb 12, 2010 Ministry of Environment, Phnom Penh, Cambodia

Agenda
5. Brief presentation on the project
6. Overview of the formulation mission and its results
7. Open discussion
8. Conclusions and way forward

List of Participants

1. H. E. Dr. Mok Mareth	Senior Minister and Minister for Environment
2. Mr. Kim Nong	Deputy Director General (PA), MoE
3. Mr. Sum Thy	Director of Climate Change Department, MoE
4. Sem Sundara	Director of International Relationship Department,MoE
5. H.E Heng Nareth	Director of Environmental Pollution Control Department and the Advisor of MoE.
6. Mr. Chuon Chanrith	Director of Natural Resources Assessment and Environmental Data Management Department, MoE
7. Mr. Roath Sith	Deputy Director of Environmental Education and Communication Department, MoE
8. Mr. Duong Samkeat	Deputy Director of EIA Department, MoE
9. Dr. Jens Erik Lyngby,	Team leader, UNEP-DHI
10. Mrs. Serena Fortuna,	UNEP-ROAP
11. Mr. Vann Monyneath	Deputy Director General, MoE
12. Mr. Yem Dararath	National Consultant
Mr. Chea Leng	National Consultant

Absent

1. Mr. Chea Chan Thou	Deputy Director, Climate Change Department, MoE

Summary of discussions

H. E. Dr. Mok Mareth (Senior Minister and Minister for Environment) opened the meeting expressing his appreciation for the project and MoE's strong support in its preparation and prompt implementation. The Minister also confirmed his strong opinion about the necessity of a quick start up of the project to all the NCCC members and DPs in Cambodia.

Brief presentation on the CCCA coastal component and overview of the formulation mission and its results

Dr. Jens Erik Lyngby and Mr Vann Monyneath briefed the audience on the duration and scope of the formulation mission of the project, which started on January 25 2010 for 3 weeks, with the main aim of consulting with the key stakeholders including meetings with key ministries of the NCCC, partners of the CCCA, other bilateral donors and organizations of relevance to the coastal zone, both at the national and provincial levels in the two potential target sites of the component, Sihanoukville and Koh Kong, two of the coastal provinces in Cambodia most vulnerable to SLR and extreme weather events.

Mr. Vann Monyneath presented an overview of the project, which, while implemented in full accordance with and contributing to the overall goal and structure of the CCCA, would focus on capacity building at national and provincial level regarding adaptation within the coastal zone, vulnerability assessment and participatory adaptation planning for the coastal area and demonstration of adaptation measures implemented in high risk agriculture areas and natural ecosystems within the

coastal zone. In this framework, Dr Lyngby also briefed on the main coastal issues in Cambodia and on few ongoing climate change activities along the coasts of the country for future potential collaboration.

The formulation mission confirmed that at the national and particularly at the provincial level, capacity building related to climate change in general is still an important need. Financial support was also highlighted by the majority of the stakeholders as a crucial issue to mainstream climate change into their activities. All the key ministries, NCDM, CCCA partners and the two provincial authorities highly support the project and are hoping for a prompt implementation.

Mr Monyneath also informed that the project has been included in the launch of the CCCA programme on February 25, 2010.

Dr. Lyngby concluded reporting on the results of the morning's informal debriefing with the CCCA partners, confirming that the programme could start with CCCA funds, tentatively from April 2010.

Open discussion

The Minister confirmed his appreciation for the CCCA and his views on the prompt implementation of the coastal component as the first action of the CCCA. H. E. Dr. Mok Mareth also confirmed that the project should be presented to the NCCC during the briefing of the CCCA on February 22 2010.

Besides this, the minister asked Mr. Sum Thy about the progress of the national support programme component under CCCA. Mr Sum Thy responded that both the coastal zone component and the national support component under the CCCA would be launched on Feb 25, 2010. Beside this, the Minister also asked that all participants provide their comments to the project team.

Mr. Sum Thy asked about the operational modality of the disbursement of the GEF funds in case this programme had already started through other funds (i.e. the CCCA funds). Clarification was made, however, that the initiation of the programme would not represent any complication for the procurement of the GEF funds, on the other hand, it could be seen by GEF as an added value.

Conclusions and way forward

H.E. Dr. Mok Mareth reconfirmed the strong support and commitment for the preparation and implementation of the project. The Minister conveyed a strong message also from the members of NCCC in support of this project and to release the related CCCA funds as soon as possible because it is a suitable time to act and serve communities and local people rather than postpone the proposed actions as the MoE has also waited a long time to start the project.

The meeting was closed at 15:41 hr.

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Vulnerability Assessment and Adaptation Programme for Climate Change within the coastal zone of Cambodia considering Livelihood Improvement and Ecosystems
Commune Workshops
28 February – 01 March 2010
Koh Kong and Sihanoukville provinces, Cambodia
WORKSHOP SUMMARY

List of participants:

Participant	Position	Institution/Commune
Koh Kong		
Mr. Yem Yan	Commune Council	Village 2, Peam Krasaop
Mr. Phat Hak	Villager	Village 1, Peam Krasaop
Mr. Chheng Sinat	Vice Chief Village 1	Village 1, Peam Krasaop
Mr. Noy Leng	Chief Village 1	Village 1, Peam Krasaop
Mr. Ol Vann	Chief Peam Krasaop Protected Area	Protected Area (MoE)
Mr. Loung Man	Second Vice Chief Commune	Village 1,Peam Krasaop
Mrs. Min Mao	Community Member	Village 1, Peam Krasaop
Mrs. Eam Ny	Community Member	Village 1, Peam Krasaop
Mrs. Toun Sok	Community Member	Village 1, Peam Krasaop
Mrs. Bann Khorn	Community Member	Village 2, Peam Krasaop
Mrs. Soun Kunthea	Community Member	Village 1, Peam Krasaop
Mrs. Chhoen Kunthea	Community Member	Village 1, Peam Krasaop
Mrs. Dov Rein	Community Member	Village 2, Peam Krasaop
Mrs. Sok Sinun	Community Member	Village 1, Peam Krasaop
Mrs. Neang Kun	First Vice Chief Commune	Peam Krasaop
Mrs. Chhorn Chhart	Community Member	Village1, Peam Krasaop
Mrs. Neak Moum	Community Member	Village 2, Peam Krasaop
Mr. Tang Bunhark	Community Member	Village 2, Peam Krasaop
Mrs. Youn Soun	Community Member	Village 2, Peam Krasaop
Mrs. Noun Channy	Community Member	Village 2, Peam Krasaop
Mrs. Mang Srey	Community Member	Village 2, Peam Krasaop
Mrs. Rous Rein	Community Member	Village 2, Peam Krasaop
Mr. Dy Sophorn	Community Member	Village 2, Peam Krasaop
Mrs. Math Sark	Community Member	Village 2, Peam Krasaop
Mr. Chey Yoeun	Chief Village 2	Village 2, Peam Krasaop
Mr. Chey Pich Rathna	Director	Dep. Environment
Mr. Chut Tith	Chief commune & community	Peam Krasaop
Sihanoukville		
Mr. Khun Sokthy	Chief	Police, Aoun Doung Thmar
Mr. Poev Chan	Vice Chief	Police, Oukyhar Keng
Mr. Tharch Sokphal	Vice Chief	Police, Veal Rinhg
Mr. San Kimsoun	Officer	Police, Boeung Ta Phroum
Mr. Seik Sophea	Vice Chief	Police, Toul Totoeung
Mr. Oun Hay	Officer	Police, Ou Chrouv
Mr. Oun Song	Coordinator Agency	Prey Nup Commune
Mr. En Chip	First Vice Chief Commune	Ou Chrove
Mr. Loeung Mein	First Vice Chief Commune	Prey Nup
Mr. Ghoun Samart	Second Vice Chief Commune	Ou Oukhaheng
Mr. Reas Duth	Commune Council	Boeung Ta Phroum
Mr. Soeung Sareit	Chief Commune	Toul Toul Totoeung
Mr. Prak Sarim	Chief Commune	Sammaky
Mr. Khut Khay	Commune Council	Toeuk Lu ork

Mr. Mot Saveat	Community Coordinator	
Mr. Nu Rarmy	Executive Director communities	
Mr. Sok La	Community Coordinator	
Mr. Val Savon	Community Finance	
Mr. Tith Savorn	Community Member	
Mr. Kong Yann	Chief Commune	Som Rong Commune
Mr. Ven Chantha	Chief	Community 2
Mr. Am Ash	Chief police post 1	
Mr. Meas Sarath	Chief police post 4	
Mr. Yim Chanthou	Commune Council	Veal Rinh
Mr. Yim Boy	Chief Community	
Mr. Samut Sokthearith	Deputy director	Dep. Environment
Mr. Tep Sinoura	Vice Chief Officer	Dep. Environment
Mr. Yim Sok	Community Technical	
Mr. Ghiv Chheang Heng	Community Technical	

INTRODUCTION

1. The commune workshops were held on 28 February and 01 March 2010 in Koh Kong and Sihanoukville provinces, respectively. The workshops were hosted by the MoE in cooperation with the Provincial Departments of Environment in Koh Kong and Sihanoukville provinces.

2. In Koh Kong, the workshop participants included representatives from commune council, villages, community, while in Sihanoukville province; the participants were from district, Commune Councils, communities and the police. A workshop agenda is included at the end of the minutes.

OPENING SESSION

The commune workshop was chaired by Mr. Vann Monyneath, Deputy Director General of MoE. In his opening remarks, Mr. Monyneath welcomed all workshop participants and opened his address by bringing the workshop participants' attention to impacts of climate change on local communities. Mr. Monyneath briefed the participants on the project. He also addressed the CCCA, which is presently launching at the MoE under the presidency of HE Dr. Mok Mareth Senior Minister, Minister of the Environment.

WORKSHOP DISCUSSIONS

The participants were invited to discuss the following topics: i) current status of Peam Krasaop and Prey Nup; ii) disasters resulting from change of climate; iii) coping strategies applied by the local communities; and iv) the responses employed by Commune Council of the two-selected areas. The discussion results are as following:

Peam Krasaop, Koh Kong:

The commune has been affected by floods every year in November - December. The commune was flooded last year by seawater (tidal activity) to a height of approximately 0.5 - 0.8 m. The flood lasted from 3 - 5 days, which was different from the previous years (in which the floods lasted only 3 - 4 hours). The cost of the damage was not assessed, but it was reported that the flood mainly impacted on the crops and rural infrastructures. After flooding, the land cannot be used for crop cultivation until after approximately 5 – 7 episodes of due to the fact that the soil quality has been adversely affected by the saltwater.

The commune is protected from the tidal activity by dams but, during the flood season, the dams are lower than sea level. It was reported that the sea level was higher than the dams by approximately 0.2 - 0.7 m.

Most people living in the commune are mainly dependent on marine fisheries. They can earn income about US$ 70 - 100 per month for a small fishing boat, and about US$ 240 - 480 per month for a big fishing boat. The discussion was also focused on whether the people wanted to cultivate rice or other kinds of crops. The answers indicate that although they want to cultivate different crops, they do not have their own lands. Some people do have the lands, but they are always affected by the seawater flooding too often.

The commune has a commune fund with the budget of US$ 23,000 per year. The commune fund differs from commune to commune and is dependent on how large the commune is. This commune is also funded by Danida with the amount of US$ 6,000 per annum. The funds are mainly used for the rehabilitation of existing physical infrastructures or construction of new infrastructure such as roads, bridges, dams, etc. Approximately 2,700 m of road was rehabilitated last year. The commune plans to rehabilitate one bridge (700 m) and some water culverts for this year.

People indicated that an early warning system was extremely useful for people who live in this commune. They reported that they could receive information beforehand regarding the storm surges from other neighbouring countries (i.e. Vietnam and Thailand).

Prey Nup area, Sihanoukville province:

It was reported that the rice cultivation in Prey Nup was affected twice by flooding during 2009. The first flood resulted from heavy rainfall within the catchment in August 2009; while the second flood was caused by tidal activity during November 2009, which caused damage to rice crops across 850 ha.

There were dams surrounding the rice cultivation area, but the dams are not high enough to protect the fields from the floods. The height of the dams has to be raised by 0.3 - 0.5 m at least to adequately protect fields.

Apart from the floods, storm surges took place in October and November of 2009 as well. It was reported that heavy storms occurred many times in 2006 and 2007, which caused damage to the rice fields.

CLOSING SESSION

Mr. Monyneath thanked the participants who attended the workshops and closed by emphasizing the importance of further collaboration and coordination with the provincial, commune, and local authorities and communities while the project will be implemented in mid-2010.

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COMMUNITY WORKSHOPS

28 February 2010: Koh Kong province
01 March 2010: Sihanoukville province

Objective: Aim of workshop was to introduce the project and the CCCA programme and to understand the climate change problems presently experienced in the demonstration sites.

Output:
- Local community understanding of the project;
- Climate change impacts will be identified;
- The needs of local community for future prevention and adaptation will be identified.

Participants: Total participant will be 40-50 persons including:

- Director of Environment
- District Governor
- Community Chiefs
- Villages Chiefs
- Community members

Agenda:
1. Opening and project briefing (Mr. Vann Monyneath)
2. Current issue of coastal communities (Mr. Yem Dararath)
3. Questionnaires of coastal community (Mr. Chea Leng)
4. Summary and Closing remark

Place: Peam Krasoap, Koh Kong province and Prey Nup, Sihanoukville province

Questionnaire for communities

Province : Koh Kong and Sihanoukville Provinces
Places : Peam Krasoap and Prey Nup
Position : Director Dep. Environment, Community members, Chief commune, Commune Council, Chief Villagers, and police post.
Date : February 28 – March 01, 2010

1. Have you ever heard climate change? ☐ No, ☑ Yes,

2. Does your village/community have had any natural disaster such as flood, drought, storm, sea level rise…etc.? ☐ No, ☑ Yes, if yes, please complete question in the table as below:

What was damaged?	How much was damaged?	Location	What year?	Remark
Paddy	850 hectares	Prey Nup	2009	Flooding and affected by seawater (sea level rise)
Dykes	4500m	Peam Krasoap and Prey Nup	2009	Flooding
Watergates	6 Places	Prey Nup	2009	Flooding
Culverts	2 Places	Peam Krasoap	2009	Flooding
Rural Roads	2500m	Peam Krasoap	2009	Flooding
Mangrove forest	8 hectares	Peam Krasoap	2004-2009	Mangrove was huge affected in Prey Nup.
Water Resources	90%	Peam Krosoap and Prey Nup	every year	Lacked of drinking water and water for agriculture
Household	38 Households	Peam Krosoap	2007-2008	Flooding and storming
Human Life	1	Peam Krosoap	2009	Drowned

3. If the project implements demonstrations in your district, will communities/local authority support this component? ☐ No, ☑ Yes,
   If yes, what kinds of activities do you prefer to improve your livelihood? Please √ in the box below:
   ☑ Education (adaptation in coastal zone)
   ☑ Mangrove ecosystem maintenance
   ☑ Reforestation
   ☑ Establish warning system
   ☑ Water resources (canal, dyke, ponds…etc)
   ☑ Publish health
   ☑ Others (If you have any comment, please identify below)

All the participants in the commune workshop strongly expressed support for the project. The Peam Krasoap commune requested for more activities on rural electric city supply, rural restroom constructing and they indicated that a warning system was extremely useful for people who live in this commune because most of the them were fishermen.

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National Consultation Workshop for the CCCA: UNEP-GEF "Vulnerability Assessment and Adaptation Programme for climate change within the coastal zone of Cambodia considering Livelihood Improvement and Ecosystems"

16 March 2010

Hotel Cambodiana, Phnom Penh, Cambodia
WORKSHOP REPORT

Name of Participants	Institutes/Ministries/ Organization	Positions
National Climate Change Committee		
H.E Dr. Mok Mareth	MoE	Minister
H.E. Prach Sun	MoE	Secretary of State
H.E. Dr. Sat Samy	MIME	Secretary of State
H.E. Sao Sereymony	MWRM	Secretary of State
H.E. Chan Nora	MoC	Secretary of State
H.E. Iv Kheng	Council of Ministers	Under-Secretary of State
Mr. Ing Virak	MoI	
Mr. Hak Hoeun	MEF	
Mr. Prok Novida	MPWT	
H.E. Nuth Chansokha	MoP	Under-Secretary of State
Mr. Ouk Setha	MAFIC	
Mr. Prak Pisid Rangsey	MoH	
Mr. Hun Chanrith	MEYS	
H.E. Bin Sambathrath	MLMUPC	Under-Secretary of State
H.E. Seng Limeng	MRD	Under-Secretary of State
Mr. Prum Chinn	M of Information	
H.E. Pon Narith	NDMC	Deputy Secretary General
H.E. Duy Thouv	CDC	Deputy Secretary General
H.E. Kul Vattana	CNMC	Deputy Secretary General
Mr. Sao Mony Raksmey	MWRM	Officer
Mr. In Vithurak	MWRM	Officer
Mr. Bin Chanmony	MWRM	Vice Chief Officer
Mr. Khoeun Sokhom	MWRM	Assistant Secretary
Mrs. Sau Sovaney	MWRM	Assistant
Mr. Nguon Mao	MRD	Assistant
Mr. Nhel Chamnab	MRD	Assistant
Mr. Stong Kia	MRD	Assistant

Ministry of Environment		
Mr. Ly Huot	MoE	
Mr. Iv Sophal	MoE	
Mr. Chea Kimsean	MoE	
Mr. Touch Vina	MoE	
Mr. Oung Vuthy	MoE	Chief Office
Mrs. Long Sokhabony	MoE	
Mr. Sum Thy	MoE	Director
Mr. Chea Chanthuo	NCCC	
Mr. Srey Sunleang	MOE	Director
Mr. Yin Bunnang	MoE	
Mr. Kim Nong	MoE	General Deputy Director PA
Governors of the four coastal provinces		
Mr. Say Socheat	Koh Kong	Representative of Governors
Mr. Phay Phan	Sihanouk Ville	Representative of Governors
Mr. Heng Vatha	Kampot	Representative of Governors
Mr. Tuoch Bunthan	Kep	Representative of Governors
Directors Department in Koh Kong Province		
Mr. Chey Picrotana	DoE	Director Department
Mr. Khy An	DAFF	Deputy Director Department
Mr. Ke Puthy	DLMUPC	Director Department
Mr. Sanh Monyroth	DWRM	Director Department
Director Department in Kampot Province		
Mr. Suy Thea	DoE	Director Department
Mr. Chan Chesda	DAFF	Director Department
Mr. Danh Sary	DLMUPC	Director Department
Mr. Chan Vanna	DWRM	Director Department
Directors Department in Kep Province		
Mr. Chea Sambo	DoE	
Mr. Pa Kim ang	DAFF	
Mr. Pat Mao	DLMUPC	Director Department
Mr. Heang Meng	DWRM	Director Department
Directors Department in Sihanoukville Province		
Mr. Hem Saroeun	DoE	Director Department
Mr. Ke Pha	DAFF	Director Department
Mr. Chin Seng	DLMUPC	
Mr. Pich Kimsan	DWRM	Director Department
Prey Nup Community		
Mr. Yim boy	Prey Nub	Chief of community
Mr. Nou Ramy	Prey Nub	Executive Director of Community
Peam Krasoap Community		
Mr.Chut Tit	Peam Krasoab	Chief of community
Mr. Yem Yan	Peam Krasoab	Vice-Chief of community
Coastal Resource Centre		
Mr. Im Panharith	CRC Kep	Chief

Mr. Ven Virak	CRC Kompot	Chief
Development Partners and NGOs		
Mr. KOEN EVERAERT	EU	Athache
Mr. Vuthy Lic	Sida	Representative
Dr. Mick Saito	UNDP	Project Advisor
Mr. Torben Krab	DCA	CC Coordinator
Pieter JM Van Maaren	WHO	Representative
Mr. HEM Chanthou	ADB	Representative
Mr. Leng Bunlong	WB	Environmental Specialist
Tep Boonny	Save Cambodia's Wildlife	Director
Master Seminar		
Vann Monyneath	MoE	General Deputy Director
Project Team		
Jens Erik Lyngby	UNEP-DHI	
Serena Fortuna	UNEP	Associate Programme Officer
Yem Dararath	UNEP-DHI	Local Consultant
Chea Leng	UNEP-DHI	Local Consultant
ITH Kessna		
Hay Sovannary		
Hay Sarath		
Mr. Yin Bunang		

INTRODUCTION

1. The national workshop was held on 16 March 2010 at Hotel Cambodiana, Phnom Penh, Cambodia, as part of the consultations for the formulation of the GEF project document and the coastal component document. The workshop was hosted by MoE. The aim was to discuss the details of the coastal adaptation programme and the results of its bilateral consultations at the national and local levels (throughout February 2010) with key national and sub-national stakeholders. Approximately 70 participants attended the event, representing the NCCC, MoE, governors and departments of the four coastal provinces, local communities (Prey Nup and Peam Krasoap), Development Partners (DPs), and NGOs. After plenary discussions, three working groups provided detailed feedback on the vulnerability assessments; adaptation measures in the agriculture sector; and adaptation measures regarding ecosystem-based resilience measures to be undertaken by the project, as well as on the related ongoing projects/activities within the coastal zones and on the potential stakeholders' roles in the implementation phase. The workshop was opened by the HE Dr. Mok Mareth Senior Minister, MoE, and closed by the HE Prach Sun, Secretary of State, MoE. A workshop agenda is attached the end of the minutes.

2. Dr. Jens Erik Lyngby, UNEP-DHI, welcomed H.E Dr. Mok Mareth, Senior Minister, Minister of Environment, Excellencies, and Distinguished participants on behalf of UNEP. He explained that UNEP has been supporting environmental management and coastal management in Cambodia for a number of years and that the organization is also currently supporting climate change adaptation and mitigation activities in Cambodia, and throughout the region.

3. The project will focus on reducing the vulnerability of coastal communities to climate change by strengthening policy and science, and demonstrating targeted local interventions to increase ecosystem resilience. The programme also represents the project of the Cambodia Climate Change Alliance, CCCA (grant project 1 on adaptation within the coastal zone). The programme will work at national,

provincial and community level with a total estimated budget of US$ 4.6 million (US$ 1.6 million from GEF and US$ 2.8 million from CCCA).

OPENING SESSION

4. H.E. Dr. Mok Mareth welcomed all national and international participants to the workshop. He stated that Cambodia has 435 km of coastline, on which more than one million people depend, and is rich in ecosystems (e.g. mangrove forests) that have the potential to improve people's livelihood.

5. The coastal zone has experienced rapid socio-economic development, urbanization, and tourism development. Additionally, cyclonic activity, storm surges and SLR has adversely affected natural resources, and the livelihoods of the population that reside within the coastal zones. Cambodia's prime minister and honourable chairman of NCCC realized that climate change issues were very sensitive and Cambodia integrated these issues into policies and socio-economic development plan at national and sub-national levels.

6. The coastal adaptation programme has the overall objective of reducing vulnerability within the coastal zone and improving people's livelihood. H.E. Dr. Mok Mareth added that this coastal adaptation programme is also responding to priorities identified in the NAPA and this is the most suitable time to act to help the country adapt to climate change and improve people's livelihood within the coastal zone. The debriefing from the formulation mission (February 2010) revealed that all key ministries and institutions at national and sub-national levels, communities, the majority of development partners, national and international organizations clearly showed the urgent need to implementation this coastal adaptation programme. He expressed his sincere gratitude to UNEP, UNEP-DHI and all donors for supporting climate change programme in Cambodia.

7. In the first session of the workshop, Dr. Jens Erik Lyngby provided a general introduction of the coastal adaptation programme that will focus on i) capacity building at national and provincial levels with focus on coastal zone issues; ii) vulnerability assessment and adaptation plans for the coastal zone developed through capacity building; iii) demonstration adaptation measures implemented in high risk coastal communities and with important agricultural activities, and iv) demonstration adaptation measures in high risk coastal communities with natural coastal ecosystems. The project and its four outcomes were presented to key ministries and national institutions, international organizations, bilateral and multilateral donors and provincial departments during the formulation mission held in February, and local communities at Peam Krosaop and Prey Nup in Koh Kong and Sihanoukville provinces. The discussions that followed indicated potential coordination with the Flood Management Mitigation Programme (FMMP) in Mekong River Committee Secretariat (MRCS).

8. The following outcomes of the national and provincial consultations were presented by Mr. Vann Monyneath:

i) Ministries are concerned with regards to climate change impacts; requirements for capacity building on climate change at both national and provincial level were put forward. All key ministries supported the implementation of the project and expressed strong interest to cooperate in its formulation and implementation phase.
ii) In the two provinces visited, the positive results of previous Danida-funded and FAO projects were highlighted. This project, as an integrated part of the CCCA, was strongly welcomed by the representatives in the local government in the two provinces and at the national level.
iii) It was expressed by the majority of CCCA development partners that the project should be implemented as soon as possible; this would also provide practical learning experience for the other projects and grants. The coastal adaptation programme would also start delivering concrete outputs on-the-ground.

iv) Overall the international organizations, bilateral and multilateral donors welcomed the project and showed interest in collaboration during the formulation and, potentially, the implementation phase.
v) All the stakeholders, national, provincial level and DPs showed a strong interest in the prompt start of the operations of the project.

9. The proposed next steps include the finalisation of the project document and submission to GEF Least Developed Countries Fund (LDCF) as well as the submission of the annual work programme and budget for coastal adaptation project to CCCA partners.

10. This session was asked to clarify the criteria used to select the Peam Krasaop and Prey Nup sites. In this regard, these sites are situated on low lying land and were identified as vulnerable areas through consultation with provincial and local authorities. In addition, this session recommended that the project should continue supporting existing projects and should focus on areas which have already been affected by climate change.

11. The outcomes of the community consultation workshops in Peam Krasaop and Prey Nup were presented by Mr. Yem Dararath. The consultation workshop in Peam Krasaop indicated that floods occur every year (November or December); in addition, a heavy flood event took place last year in November and lasted for 3-5 days. Floods affect physical rural infrastructure, including roads, houses and schools, etc. Sea water was higher than the protected seawater dykes by approximately 0.2 m to 0.7 m. Most people are primarily dependent on marine fisheries. Commune fund: US$ 23,000 per year, Danida support: US$ 6,000 per annum. The funds are mainly used for: roads, bridges, sea protected dams, etc. Approximately 2,700 m of road was rehabilitated last year. The commune plans to rehabilitate one bridge (700 m) and some water culverts for this year.

12. The consultation workshop showed that total area for paddy fields is 10,500 ha; they yield: 2.4 – 3.0 t/ha; and floods occur twice a year in August and November. In 2009, about 850 ha were damaged. Dykes surround the rice cultivation area, but the dykes are not high enough to protect from all floods. The height of the dam walls have to be elevated by 0.3-0.5 m higher than the current level. Storm surges occurred in October and November.

13. Seawater dykes need to be rehabilitated; some areas at Prey Nup need to be planted; and vulnerable areas along the coastal provinces need to be identified and mapped.

14. It was recommended that this project should include the infrastructure and household considerations to improving people's livelihoods. Furthermore, the damage of rice cultivation area was corrected from 850 ha to 77 ha.

15. In the next session Dr. Jens Erik Lyngby stated that the goal and objective of the project was to reduce the vulnerability of coastal communities to climate change by strengthening policy and science, and demonstrating targeted local interventions to increase ecosystem resilience. He showed that the outcome of the project, should be (i) Increased and strengthened institutional capacity to design and implement climate change adaptation measures; (ii) Improved adaptation planning by identifying climate change hotspots and ecosystem buffers against climate stresses; (iii) Reduced vulnerability of productive systems to increased floods; and (iv) Increased resilience of coastal buffers to climate change and improved livelihoods. He presented the four programme projects: (1) Policy: Strengthening national policy, regulatory and institutional coordination for managing climate change adaptation programmes within the coastal zone; (2) Science: Vulnerability assessment and adaptation planning for coastal zone adaptation; (3) Demonstrating coastal flood control measures in agricultural

zones of livelihood significance; and (4) Demonstrating coastal ecosystem based resilience measures. The activities of each project are detailed in the numbering 16.1, 16.2, 16.3 and 16.4 below:

16.1. Policy: (a) Methodology for designing and implementing adaptation measures developed and adopted by government; (b) Climate change risks and measures identified and incorporated into national development plans; (c) Increased awareness and coordination capacity of intersectoral coordination committee on climate change adaptation; and (d) Development and use of indicators for monitoring climate change impacts in coastal zones (to be included in the State of the Coastal Environment Report).

16.2. Science: (a) Vulnerability and risk assessments produced for sensitive ecosystems and infrastructure; (b) Vulnerability maps and adaptation measures produced for planning purposes; (c) Development of institutional capacity for identifying adaptation solutions based on different climate scenarios; and (d) Climate change science integrated into policy (i.e. land use/coastal development plans).

16.3. Coastal flood control: (a) Organisation of local communities for operation and maintenance of water resources protection measures in areas identified in the adaptation plan; (b) Adapting coastal agricultural practices to change climate conditions for livelihood improvement through integrated farming principles; and (c) Training plan implemented for participating community.

16.4. Coastal ecosystem resilience: (a) Ecosystem based coastal protection through mangrove systems established; (b) Reduced pressures on mangrove systems, i.e. sustainable harvesting and management, alternative fuel and livelihood sources; (c) Training plan implemented for participating community; and (d) Time schedule.

17. This session was asked to identify the structure between this project and CCCA. In this regard, the structure between this project and CCCA was showed in the slide and a more detail outline would be described in the final CCCA document. Greater structure detail was clearly explained by Mr. Koen Everaert, European Commission. He added that the coastal zone project would get three millions US$ from the CCCA trust fund.

DISCUSSION SESSION GROUP

18. The participants were invited to sit in three groups and discus the different project programmes. Group 1 discussed Project 2: Science: Vulnerability assessment and adaptation planning for coastal zone adaptation. Group 2 discussed Project 3: Demonstrating coastal flood control measures in agricultural zones of livelihood significance; and Group 3 discussed Project 4: Demonstrating coastal ecosystem based resilience measures. This session was prepared and organized by Mrs Serena Fortuna and the expectation output of each project and guiding questions is attached as Appendix 3.

19. Group 1 identified problems facing the coastal zone; namely, forest fire, expansion of agriculture land, household expansion, and quarry exploitation in the high land areas. Additional problems within the coastal zone include sedimentation of coastal waters, sand exploitation, mangrove deforestation, untreated municipal sewage flowing into the coastal waters and fisherman using chemicals to poison fish. There was flooding in Kampot and Koh Kong provinces; furthermore, storm intensity and higher temperature dramatically increased in Kep province.

19.1 MoE and relevant departments in the province have been re-planting the mangrove forest, enhancing the agriculture production to improve people's livelihoods, as well as educating people to manage the natural resources, and to manage waste.

19.2. To achieve the coastal adaptation programme output, the group decided to integrate the relevant ministries, provincial departments and authorities into the national committee at the ministry level, and subcommittee at the provincial level. The committees have a responsibility to fulfil the role and to implement the project objectives. At the same time, they also perform assessments on their actions.

20. Group 2 showed that the MAFF, coastal provincial authority, the provincial department of agriculture, bilateral donors and NGOs have worked on the enhancement of agriculture practices/farming systems. The MAFF and provincial department of agriculture enhancing farmers have selected the seeds that can be harvested in the short period and also encourage farmers to planting the rice on paddy. In this regard, some NGO (FAO, CEDAC) provided technical and financial support to educated farmers to increase their agriculture products.

20.1. The Ministry of Water Resources and Meteorology (MoWRAM), provincial department of MoWRAM, provincial authority, AFD and JICA have worked on flood control measures along the coastal zone. With this regard, the salt water dyke has been rehabilitated at Prey Nup in Sihanoukville Province funded by AFD. In addition, salt water dykes have been constructed in Tma Sar, Koh Kong province by MoWRAM. MoWRAM also has constructed irrigation system and created the FWUC.
20.2. To achieve the output of the coastal adaptation programme above, MoWRAM has surveyed and proposed project on constructing new infrastructure and rehabilitation, proposed to create the new FWUC, provided sufficiency methodology information on time, strengthening the farmer communities and created the communities in other areas, and strengthening capacity building to government officers and farmers.

20.3. The group also requested the coastal zone project implemented in Kampot and Kep provinces to enhance agriculture products and improve farmer's livelihood.

21. The group 3, pointed that the coastal provinces has used coastal ecosystems as a mean of protection against natural hazards, such as replanting mangrove forest in Kampot, Sihanoukville and Koh Kong provinces; furthermore, the coastal provinces authority, relevant departments and NGOs have prevented and conserved mangrove forest, sea grasses, seaweed, and coral reef.

21.1. The relevant ministries, provincial departments, provincial authority, and NGOs have been working on strengthening the community's capacity building on sustainable using mangrove forest in Peam Krosaob, Koh Kong province, rehabilitation salt dyke in Prey Nup, Sihanoukville Ville Province.

21.2. To achieve the output the coastal zone project above, Provincial departments of environment, forestry administration, and local authority would implement and coordinate activities. This coastal adaptation programme would more job be provided, utilize natural resources in sustainable manner, and the programme would provide benefit, such as income, technical experience, materials, and capacity building to stakeholders.

WORKSHOP SUMMARY

22. Mr. Vann Monyneath expressed sincere thanks to all national and international participants who have attended the workshops. He pointed that the **session 1**, all participants have been presented the general situation and current issues and assessment the impact of climate change in Cambodia coastal zone. **Session 2**, the resulted of consultation with key ministries and institutions at national and sub-national levels, community people, development partners, national and international organizations has been presented and defined in three comments, **(i)**. The stakeholders strongly supported the project,

(ii). The project team will finalize the preparation of the project document and administrative arrangements for submission to donors (GEF for 1.6 million US$ and CCCA 2.8 million US$) and consequent disbursement of funds, **Session 3**, the resulted of both communities' workshops in Peam Krosaob in Koh Kong and Prey Nup in Sihanoukville Ville Provinces have been presented to participants. These workshops showed that **(i)**. Rehabilitated and construed dyke have been requested, **(ii)**. Replanting mangrove forest in Prey Nup has been requested to reduce strong wave and storm, **(iii)**. The vulnerable areas has been clearly identified in mapping were requested. **Session 4**, the four projects in this coastal adaptation programme has been presented in the workshop. Session 5, the participants have been divided in to three groups to discuss difference topic in consequence, such as group1 had discussed on project 2, group 2 had discussed on project 3, and group 3 had discussed on project 4.

23. The group discussions also showed strong interest from the other coastal provinces to implement adaptation measures through the proposed programme. The team however clarified that the final decision on the demonstration sites will be taken through the results of the vulnerability assessments (project 2 of the programme)

CLOSING SESSION

24. **H.E. Prach Sun**, Secretary of State of Ministry of Environment expressed that the national consultation workshop today came up with fruitful result by discussing, sharing experiences, and seeking measure solving negative impact of climate change has affected people livelihood and infrastructure.

25. As H.E. Dr. Mok Mareth said, Cambodia's prime minister recognized that climate change was a cross sector issue, thus Cambodia needed integrated the climate change issues into policy and socio-economic development planning in both national and sub-national level. So, this workshop identified the priorities issues, solving measure and advance prevention the impact of climate change to sustainable development in Cambodia.

26. Three recommendations were provided in the workshop **(i)**. The coastal adaptation programme should be implemented with positive result based on the need of people, **(ii)**. The programme has integrated the recommendations of the workshop, well prepared and clearly details in coastal adaptation programme activities planning, and continues cooperation with relevant key stakeholders, and **(iii)**. Strongly believed that the recommendations in this workshop and harmonized efforts enhanced the programme with the successful result.

27. **H.E Prach Sun** taking this opportunity to thanks Excellencies, Distinguished Participants, Ladies and Gentlemen to participate this workshop and sincere thanks to donors provided funding support to organize workshop and implementation of the programme. In addition, requested all development partners and international donors continue provide funding support to sustainable development and climate change programme in Cambodia.

Workshop Agenda:

Time	Content	Resource
Morning– Plenary		
7.00-8.00	Registration	Kessna
8.00-8.05	Introduction the agenda and National Anthem	Vann Monyneath
8.05-8.15	Welcome remark	Jens Erik Lyngby

8.15-8.30	Opening speech	**H.E Dr. Mok Mareth**, Senior Minister, Minister of the Environment
8.30-9.00	Photo session and small break	
9.00-9.15	Introduction to Vulnerability Assessment and Adaptation Programme for Climate Change within the coastal zone of Cambodia Considering Livelihood Improve and Ecosystems	Jens Erik Lyngby
9.15-9.30	Presentation of consultation outcomes with national and provincial stakeholders	Vann Monyneath
9.30-10.00	Presentation of outcome of Community Consultation Workshop (Prey Nup and Koh Kong)	Yem Dararath
10.00-10.30	Coffee break	
10.30-11.00	Detailed presentation of components in the Vulnerability Assessment and Adaptation Programme for Climate Change within the coastal zone of Cambodia Considering Livelihood Improve and Ecosystems**.**	Jens Erik Lyngby
11.00.11.15	Introduction to group discussion	Serena Fortuna
11.15-12.00	Discussion sessions in groups	Facilitators
1200-1330	Lunch break	
Afternoon –Sessions continue		
13.30-14.00	Presentation of outcome of morning discussion	Facilitators
14.00-15.30	Discussion of demonstration components on adaptation and resilience in coastal area	Facilitators
15.30-16.00	Coffee break	
16.00-17.00	Presentation of group discussions	Facilitators
17.00-17.15	Summary and Way forward	Vann Monyneath
17.15-17.30	closing of Workshop and National Anthem	H.E. Prach Sun, MoE

Guiding questions:

OUTPUT 2:

a) Are there any relevant related current problems to be considered in the coastal area?
b) Is you ministry/agency/organization already working towards the same outputs?
c) How would you identify your ministry/agency/organization role in the achievement of the output?

OUTPUT 3:

a) Has your ministry/agency/organization worked on the enhancement of agriculture practices/farming systems?
b) Are there any relevant flood control measures already in practice along the coastal area?
c) Is you ministry/agency/organization already working towards the same outputs?

d) How would you identify your ministry/agency/organization role in the achievement of the output?

OUTPUT 4:

e) Has your ministry/agency/organization used coastal ecosystems as a mean of protection against natural hazards/SLR?
f) Are there any relevant mangrove rehabilitation project planned/ongoing? Or any projects on alternative livelihood relying on mangrove resources?
g) Is you ministry/agency/organization already working towards the same outputs?
h) How would you identify your ministry/agency/organization role in the achievement of the output?

Appendix 20: Information related to the CCCA Coastal Component

The Cambodia Climate Change Alliance (CCCA) is a comprehensive and innovative approach to address climate change and disaster risks in Cambodia. The overall objective of the CCCA is that: *Climate change activities in Cambodia are nationally owned, led and aligned with Cambodia's development priorities, and are effectively coordinated and implemented*. This strategic approach is based on a few basic principles: climate change must be given higher priority by the government and society; adaptation and mitigation must be addressed in a broad development context and linked to the government's poverty reduction agenda; climate change is about people and their livelihoods. Special efforts are also being made to include women, youth and minorities in the process. The CCCA is the leading climate change facility in Cambodia and represents a multi-donor trust fund with an initial budget of US$ 8.5 million, through contributions of the EU, Danida, SIDA and UNDP, of which US$ 2.2 million has been allocated as parallel co-financing for the project (endorsement of CCCA Programme Support Board meeting, 11 August 2010). UNDP is currently acting as multi-donor trust fund manager, with the long-term vision of empowering the government and transferring this role to the MoE after the first three years of CCCA implementation. Additional funds may be provided to the CCCA and thereby allow for implementation of additional climate change actions within the coastal zone which have been identified as part of the present project and thereby act as a multiplier for climate change adaptation.

The Cambodia Climate Change Alliance was inspired from a wider EU effort on climate change, the Global Climate Change Alliance (GCCA), established in 2007 between EU and selected developing countries expected to be most severely impacted by climate change. The overall objective of the GCCA is to assist developing countries in increasing their capacity to cope with climate change impacts and support their achievements of the MDGs, as well as to represent these countries in international climate change negotiations. The CCCA programme has been developed in response to this objective and the proposal outlined in this document is an integrated part of the programme. The following text[137] describes the role and approach of the CCCA:

"CCCA is a comprehensive and innovative approach to address climate change and disaster risks in Cambodia. On the one hand it aims at creating conditions in the form of capacity building and institutional strengthening to preparing for and mitigate climate change risks, and on the other hand, to directly help vulnerable communities by enhancing their resilience to climate change and other natural hazards. The CCCA is anchored in the government's National Climate Change Committee (NCCC), which is the mandated government coordinating and policy support entity for all aspects of climate change and has the capacity to provide the coordination required by other government agencies and civil society. The CCCA includes a unified engagement point for development partners and a multi-donor financial facility to provide resources for climate change capacity building at national and local government level. It will also include a mechanism for knowledge sharing and learning which will extend beyond the government to civil society and the broader Community of Practice."

The three key results of the CCCA Support Programme are:

- Result 1: NCCC capacity to coordinate national policy making, capacity development, and outreach/advocacy efforts and to monitor the implementation of national climate change strategy is strengthened.

[137] Text taken from the CCCA project document, 2009.

- Result 2: A platform is established and in operation providing Cambodia with updated knowledge and learning opportunities on climate change.

- Result 3: Key line ministries, agencies and civil society organisations have access to financial and technical resources to design, implement and monitor climate change adaptation interventions.

The organizational structure of the CCCA is based on strong Government ownership and alignment with the existing institutional arrangements. The MoE is the government implementing partners, on behalf of the NCCC who will provide policy oversight and ensure necessary intra-ministerial guidance and coordination. A CCCA National Programme Coordinator has been appointed and is responsible for the overall management of the CCCA Support Programme. A CCCA Programme Support Board (PSB) has been constituted for policy level decision making, and it is composed by eight members, of whom four will represent the different Government agencies as nominated by the NCCC and four the CCCA donors. The PSB has also overall authority to decide allocation of funds to grants and components.

The project will contribute to all the three above mentioned CCCA results, in particular to Result 1 and 3. The project will also work very closely with Result 2, which will function as an active and government-owned repository of knowledge and lessons learned generated through the project's implementation. While details of this coordination with Result 2 will be updated during project implementation as well as through regular cooperation between the project implementation team and the CCCA Support Programme, it is envisioned that the project will *inter alia*: i) contribute to populating the internet-based knowledge management service to be created within Result 2; ii) support CCCA Result 2.2 "The Community of Practice on Climate Change in Cambodia is strengthened and enhanced" in collaboration with the CCCA's UNDP/ CCD team by disseminating relevant information and knowledge on coastal climate change adaptation into the process and the National Climate Change Forum (to be organized by the CCCA Support Programme); and iii) support Result 2 on a more regular approach by providing information when appropriate on coastal climate change issues during the Climate Change Community and the Climate Change Donor network (to be organised as outputs of the Result 2). With regards to Result 1, this project will assist with strengthening of capacity within the NCCC and CCD to equip them with the necessary knowledge and skills regarding coastal climate change adaptation, complementing the knowledge and capacity building activities to be undertaken by the CCCA Support Programme (which are to be undertaken across other departments and ministries and related to topics across the whole of Cambodia, not simply limited to the coastal zone). Furthermore, the project will support the overall CCCA in the achievement of Result 3 by implementing specific adaptation measures in the coastal areas identified as being most vulnerable to climate change impacts. Specific knowledge and information will be fed from the coastal areas to help achieve CCCA Results 3.1[138] and 3.2[139].

Importantly, all of the activities implemented under the project will be complementary, and not duplicating the activities undertaken by the CCCA Programme Support. In order to ensure this effective coordination, the project will be implemented in close coordination with the CCCA National Programme Coordinator, who will be an active member of the project's Steering Committee and will work closely with the Coastal Component Coordinator (CCC[140]) (refer to Section 4 for more details).

[138] CCCA result 3.1 Development and dissemination of mainstreaming materials, guidelines and concepts and their progressive integration into sector activities at national and sub-national level.
[139] CCCA result 3.2 Capacity needs and opportunities for effective climate change mainstreaming are identified in key sectors and priority measures formulated and implemented.
[140] The project is termed 'the coastal component' within the CCCA Coastal Component document.

Regular meetings will also be conducted between the CCCA Support Programme team and the project's implementation team in order to ensure the establishment of synergies and, potentially, the implementation of joint activities.

The CCCA has developed a CCCA Coastal Component document to facilitate the release of CCCA funds complimentary to the ones reported in this project document. The outputs of this document differ from those in the project document because the two documents were developed according to different criteria and at different times. However, the activities proposed in both documents are well-aligned. The CCCA Coastal Component document includes seven outputs of which CCCA funds will be allocated towards covering a portion of project management costs; and funding Outputs 6 and 7. Outputs 1 – 5 will be covered through the LDCF-funded activities included within this project document. The activities included within Outputs 6 and 7 will go towards achieving Outcomes 1 – 4 detailed in this project document. As such, the allocation of CCCA parallel co-financing against the project's outcomes, project management and M&E is described in the table below (based on the budget allocations presented in the CCCA Coastal Component project document):

Outcome 1	Outcome 2	Outcome 3	Outcome 4	Project Management	M&E
US$ 315,000	US$ 459,600	US$ 479,700	US$ 640,700	US$ 275,000	US$ 30,000

Total: US$ 2,200,000

The two outputs from the CCCA Coastal Component document which will be funded by CCCA are as follows:

Output 6. Improved climate change knowledge integrated into land use and coastal development plans

The process of development planning in Cambodia is a combination of "bottom-up" and "top-down" processes, in which provincial agencies respond to national-level policies, while Commune Councils prepare plans in response to community needs. These two processes are reconciled through "District Integration Workshops", at which Commune Councils, civil society organizations and provincial agencies meet to coordinate planning processes. These workshops are facilitated by the Provincial Rural Development Council, chaired by the provincial governor. The Provincial Rural Development Councils work closely with provincial line agencies to support Districts and Communes in implementing projects which improve livelihoods. In order to ensure that climate change adaptation in the coastal zone is effectively incorporated into the development process in Cambodia, it is essential to work with both the Commune Councils and the Provincial Rural Development Councils.

Activities under Output 6:

Activity 6.1 Develop land use planning guides to integrate climate change consideration for coastal zone management.

Activity 6.2 Facilitate climate-considerate formulation of Commune Development Plans[141].

Activity 6.3 Coordinate and promote effective collaboration between Commune Councils and ministries, institutions, departments, NGOs/IOs, private sector and other development partners to support capacity development of the communes in issues related to adaptation to climate change[142].

[141] This would potentially also include integrating climate change concerns into Commune Investment Plans, which will be defined province by province in consultation with local stakeholders.

[142] Importantly, existing structures will be used to support this.

Activity 6.4 Collaborate and coordinate with the Executive Committee of the Provincial Rural Development Councils[143], and align departments to support the implementation of climate change adaptation activities.
Activity 6.5 Provide technical advice to the Provincial Governors and the Executive Committee on matters related to implementation of climate change adaptation and climate risk reduction activities.
Activity 6.6 Provide technical services to rural infrastructure projects related to reducing exposure to climate risks[144].

Output 7: Increased resilience of coastal communities and coastal ecosystem buffers to climate change and improved livelihoods
The present rice production in the coastal zone is not sufficient for local demand, and significant efforts have been made to increase production and to provide facilities that can protect these areas against floods. These efforts include the rehabilitation of dykes established through previous development assistance. When designing these facilities and rehabilitation of dykes, the potential impacts of SLR or changed variability in extreme events e.g. floods were not considered. However, climate change is expected to adversely affect these systems, partly through salinisation and changes to precipitation, as well as through altered temperature and drought patterns. Presently, local communities and developers exert strong pressure on the ecosystems in the coastal zones, including mangroves, which function as a significant buffer to impacts from extreme weather events.

Communities must be at the heart of efforts to build their resilience to climate change, as adaptation is inherently local. Presently, the information available to farmers and other community members is minimal, and is not available in a form that is useful or easily understood by community members. Communities' adaptation efforts will only be effective if they are supported by national strategies and policies on the likely impacts of climate change, including the capacity to provide reliable information delivered in ways that communities and policy makers can understand and respond to. Through this output, communities within the selected coastal sites will be trained in sustainable water management techniques and sustainable natural resources use. In this way, their adaptive capacity will be improved and they will be equipped with the skills to improve their livelihoods and thereby improve income streams. Additionally, assessments and analyses will be undertaken in the demonstration sites as part of this output, which will complement those assessments and analyses undertaken for the entire coastal zone (see Output 3) by assisting in the identification of additional demonstration activities within the target districts.

This output will be achieved by working closely with the affected communities in identified vulnerable areas in Sihanoukville's Prey Nup district and Peam Krasaop/Koh Kong district in Koh Kong to build awareness around and resilience to climate change impacts. Based on the scenario development from Output 3, an understanding will be established between the national authorities and the local communities for identifying necessary works to be conducted to maintain dykes and other facilities, to ensure an acceptable low risk level in relation to forecasted climate change, as well as for identifying the necessary budget for the relevant work to be carried out in accordance with the signed MoU between Ministry of Economics and Finance, Ministry of Water Resources and Meteorology and the local FWUCs.

[143] This collaboration will allow EXCOM to act as the main implementing entity at the community level, to avoid a top-down approach.
[144] The results of the analyses undertaken by the coastal component will provide guidance regarding what type of infrastructure is required and suitable where. Thus, the results of the analyses can be used to mobilize funds for the appropriate infrastructure. Hence, technical services provided through this activity are likely to be writing of proposals to access specific funding sources etc.

Agricultural and land use practices in rural Cambodia may generate short-term benefits (financial or otherwise), but without consideration of climate change risks they are likely to reduce adaptive capacity in long term. In addition, agricultural practices that require large amounts of water, cutting of trees and forest, drainage of wetlands for cultivation, and the filling in of natural ponds make farmers increasingly more vulnerable to climate change impacts. Solutions to reduce vulnerability include the adoption of more diverse farming systems, diversification of crop varieties to allow farmers to adapt to future climate conditions, physical flood prevention measures, as well as water-harvesting techniques if required (e.g., rainfall capture and small water catchment basins). These practices will increase groundwater recharge and reduce soil erosion and increase water availability for human and livestock. The output will demonstrate the adoption of these and other agricultural options to reduce vulnerability of the agriculture sector locally to the likely impacts of climate change. In this way, this output will contribute to reducing the incidence of poverty in the demonstration sites.

The communities living in the mangrove areas derive a significant part of their livelihood from the mangrove and its associated biodiversity and have limited other livelihood options. It is therefore important to raise the awareness and understanding of the communities in regard to the protective role of the mangroves in relation to extreme weather events and climate change impacts and to provide them with other livelihood options. This should be at the heart of any efforts to increase their resilience. Re-planting of mangrove will be done in identified areas and this will be combined with raising awareness in the communities on benefits and carbon markets.

A core target is the achievement of a tangible improvement of livelihoods in the local communities within the mangrove areas. Aside from the much-needed positive impact on additional local community revenues to be generated, the livelihood improvement is considered to be an important strategic element to gain support and participation in the sustainable management of the mangrove forests. The approach regarding livelihood improvements will be a sustainable exploitation-oriented revenue generation, because the priority for local people is survival and food security. All livelihood activities will be based on a participatory co-management of coastal resources integrating all community levels including marginal fisher folk and their families, thus ensuring that the poorest households benefit equally with other community members. The introduction of alternative livelihoods will follow assessments of the feasibility and cost effectiveness of available livelihood options (e.g. introducing and piloting micro-enterprises, such as hair salons and engine repair workshops, integrated farming principles and providing micro-loans). The alternative livelihoods listed are examples and those selected and piloted in the demonstration sites are certainly not limited to these. Assessments of feasible livelihoods will be undertaken to identify livelihoods to be introduced.

The coastal component will partner with other initiatives as mentioned in on-going projects in building capacity in FWUC's to ensure that climate resilience elements can be incorporated into operation and maintenance-related day-to-day activities. The activities will include measures to minimize operational costs of the FWUCs while developing adequate individual capacities to make a better basis for sustainability. Commune Councils (or groups from within the councils) will be utilised to manage demonstration interventions[145]. However, FWUCs will be utilised as management committees in within Prey Nup demonstration sites. FWUCs are active and effective in the Prey Nup polder, largely as a result of them receiving extensive capacity building from AFD. The coastal component will also partner with other initiatives e.g. the UNDP LDCF project (see Linkages section), in building capacity in the coastal communities to ensure that climate resilience elements can be fully incorporated daily

[145] Additionally, this provides an opportunity to promote partnership between the Commune Councils and NGOs/CBOs for implementation of component activities. Sub-groups of the Commune Councils will only be utilized when councils are very large. Focus will be placed on utilizing the entire council, where feasible.

activities. It is considered that the livelihood options introduced will stimulate the local communities to fully adopt the proposed measures for protection of mangroves.

Importantly, improving gender equality will be the forefront of each activity and the coastal component will ensure that female-headed households are targeted and that women are actively involved in all training activities. To this degree, gender-related indicators have been included in the Strategic Results Framework (see Appendix C) to measure the success of such efforts. Furthermore, the activities contributing to this output will improve livelihoods and income streams within particularly vulnerable coastal communities and will, in this way, contribute to the reduction in poverty levels. Additionally, communities within the demonstration sites will be equipped with the skills required to reduce their vulnerability to climate change impacts, protect agricultural investments to climate-related hazards and diversify income streams in the face of climate change, all of which will reduce poverty levels. Details regarding the demonstration activities identified following the rapid assessments undertaken during the Project Preparation Grant (PPG) Phase are included in Appendix G. Importantly, these activities are flexible and are likely to be fine-tuned based on the analyses undertaken by the coastal component and following efforts will be undertaken to ensure that the activities do not overlap with investments already set out in the commune development plans.

Output 7 will include a number of specific capacity building activities focusing on awareness raising on climate change impacts and training in identified livelihood alternatives as outlined in the component description. The capacity development will mainly focus on the targeted communities and institutions such as commune councils in the demonstration areas. Staff from the provincial departments in the demonstration areas and local consultants will be involved extensively as facilitators/trainers in relation to this output which will call for a number of specialised training sessions in relation to awareness raising and for the proposed livelihood options.

Activities under Output 7 include:
Activity 7.1 Assessment of implementation capacity of demonstration activities, the activity will be a rapid assessment of the capacity of the institutions involved with this CCCA coastal component, at national level as well as at local level. The output of this activity will also contribute to ensuring the long term sustainability of the component, by identifying the capacity building needs; it will also contribute to setting up the component implementation team
Activity 7.2 Assessment of current coping strategies in target communities in relation to flooding, drought and extreme events.
Activity 7.3 Vulnerability and risk assessment of community livelihoods in target districts with a view on current climatic conditions and projected trends (scenario-analysis) and, based on these assessments, introduce alternative livelihoods.
Activity 7.4 Organise local coastal communities for operation and maintenance of water resources/flood protection and mangrove rehabilitation to respond to projected impacts from climate change.
Activity 7.5 Review the vulnerability of existing agricultural practices to the impacts of climate variability and climate change.
Activity 7.6 Analyze economic and social costs and benefits of options for modified agricultural practices and fuel wood production that are less vulnerable to impacts of climate variability and climate change.
Activity 7.7 Together with identified target communities, introduce and apply modified agriculture practices to adapt to the projected changes in climate.
Activity 7.8 Develop training materials for scaling-up and adoption of modified procedures.
Activity 7.9 Support identified NGOs to integrate project lessons on resilient farming practices and fuel wood production into extension activities in the target coastal zones.
Activity 7.10 Introduce diversified agricultural crops appropriate to local climate.

Activity 7.11 Support and strengthen farmer associations and production groups in target districts in promoting and adopting resilient agricultural methods and techniques.
Activity 7.12 Development of guidance for climate-resilient irrigation design.
Activity 7.13 Assessment of training needs and implementation of training in FWUCs with regards to climate risk management; involving local authorities, extension staff from PDE; Provincial Department of Agriculture (PDA) and Provincial Department of Water Resources and Meteorology (PDOWRAM) in training events.
Activity 7.14 Development of awareness, outreach and training materials for community members;
Activity 7.15 Organization of field visits in project areas/demonstration communities by NCCC members and community members from other districts.
Activity 7.16 Develop joint education and awareness raising activities with existing ecosystem conservation projects, highlighting the implications of the effectiveness of resilient natural resource management practices in the context of climate change.
Activity 7.17 Prepare detailed implementation plan for community adaptation demonstrations.
Activity 7.18 Establish a monitoring and evaluation (M&E) format for assessing benefits of demonstration activities.

Appendix 21: UNEP's comparative advantage

UNEP has a proven international record for its strong technical and scientific background and as such, is an appropriate agency for providing implementation support regarding the assessment of climate change risks within the Cambodian coastal zone and the testing of innovative adaptation options, in particular. Indeed, UNEP has undertaken many projects where innovative solutions and methodologies are demonstrated at the local level. Such projects comply with the mandate from the Governing Council, as enshrined in the Bali Strategic Plan. Additionally, UNEP's and the UNEP-DHI Centre's experience regarding agriculture and water projects in Cambodia is well-recognised by the CCU and MoE.

With regards to the LDCF, UNEP has considerable experience in implementing LDCF projects in Africa as well as across Asia and the Pacific, and will draw on such experience when implementing this project. UNEP's work on climate change adaptation focuses primarily on three main areas, namely: i) undertaking science and assessments; ii) providing knowledge and policy support; and iii) building ecosystem resilience for adaptation. UNEP's credibility as a capacity builder, knowledge mobiliser and ecosystem manager has been established through the implementation of approximately 80 adaptation-related projects at the global, regional and national levels. UNEP has recently shifted the focus of its adaptation work to EBA through the EBA Flagship Programme of UNEP. This approach involves managing vulnerable ecosystems to build their resilience and use ecosystem services for climate change adaptation and disaster risk reduction (see paragraph 102). The adaptation measures proposed under the project are well within the scope of UNEP's work on climate change adaptation.

In addition to UNEP's previous experience in Asia as well as in other countries worldwide, Cambodia is one of the focal countries in several other UNEP-lead regional and national initiatives, namely: i) the Southeast Asia Network of climate change Focal Points (which also directly involves the CCD); ii) the Adaptation Knowledge Platform (see Section 2.8); iii) the Asia Pacific Adaptation Network; and iv) the Technology Need Assessment and Action Plan (Cambodia specific).

The project is also consistent with UNEP's comparative advantage as identified through the GEF Council paper on the subject (C.31/5), which delineates UNEP's comparative advantage in providing the GEF with a range of relevant experiences, proof of concept, testing of ideas, and the best available science and knowledge upon which it can base its investments. Additionally, the GEF Council paper (C.28/18) also details UNEP's comparative advantage areas as including "developing and using climate information to effect changes in relevant sectoral policies based on climate science", which is addressed by the project.

The project contributes to the achievement of the three following outcomes of the UNEP's Programme of Work for 2010-2011 for climate change adaptation: i) generating and mobilising knowledge for adaptation through, for example, impact and vulnerability assessments, the Global Adaptation Network and a World Research Programme on Impacts, Vulnerability and Adaptation; ii) supporting capacity building, policy setting and planning; and iii) supporting EBA.

Additionally, the UNEP-DHI Centre has been working within the coastal zone of Cambodia for the last 10 years (including six years of country presence), and as expressed by the MoE, this support has been effective and successful. The UNEP-DHI Centre has a well-developed network in Cambodia and has extensive experience in managing large-scale cross-sectoral projects working with national and provincial authorities, local communities and NGOs. The established networks and structures will be used and therefore only a part-time senior technical advisor (STA) will be contracted by the project

due to the national management capacity established through the previous activities within the coastal zone.