

# Support to CC education, awareness-building and FWUC strengthening



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# Support to CC education, awareness-building and FWUC strengthening

Concept note prepared by DHI under the  
Coastal Adaptation and Resilience Planning (CARP) Component,  
Cambodia Climate Change Alliance

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## **Acronyms and abbreviations**

CARDI:	Cambodia Agricultural Research and Development Institute
CARP:	Coastal Adaptation and Resilience Planning
CC:	Climate change
CCCA:	Cambodia Climate Change Alliance
CR:	Climate resilience
DOA:	Department of Agriculture
DOE:	Department of Environment
DOWRAM:	Department of Water Resources and Meteorology
FWUC:	Farmers' water users community (water user group)
MAFF:	Ministry of Agriculture, Forestry and Fisheries
MOE:	Ministry of Environment
MOWRAM:	Ministry of Water Resources and Meteorology
NAPA:	National Adaptation Programme of Action
NCDD:	National Committee for Sub-National Democratic Development
PWG:	Provincial Working Group
RGC:	Royal Government of Cambodia
SCW:	Save Cambodia's Wildlife

## Summary

The present concept note is related to Outcome 2 of the CARP: *'Increased resilience of coastal communities and coastal ecosystem buffers to climate change and improved livelihoods'*. It covers climate-related education and awareness-building at the province and commune levels and FWUCs.

Training needs were identified and evaluated during consultations under CARP in May and June 2012.

Three related activities are proposed:

- Training-of-trainers (from the PWGs); and pilot education and awareness-building sessions at commune level: 2 suites of sessions, one in each province, with participation by around 12 PWG members and around 48 commune/village representatives.
- A series of two pilot FWUC training sessions, one in each province, each with a duration of 3 days, with 25 FWUC representatives participating in each session, with briefings on CC concerns and management options, and one day allocated for a site visit.
- A 4-days study exchange visit to Cuu Long Delta, with 24 participants (16 government employees and 8 FWUC representatives), and a 2.5 days return visit with 8 participants.

The training-of-trainers (from the PWGs, representing provincial departments) will contribute to CC-related skills development at the province level. The pilot implementations will contribute to local awareness and understanding of CC-related challenges and adaptation options. They are intended as a starting point for replication.

The FWUC training sessions will contribute to improved understanding of climate-related challenges and options within irrigation management, cultivation technology and livestock breeding.

The exchange visits will add to the understanding of opportunities and management options related to salinity control of paddy fields; and high-yield double cropping. Also, they will provide strengthened capacity of the PWGs, provincial departments and the Governors' offices to meet climate-related, socio-economic development needs and opportunities by climate-resilient production systems and infrastructure.

The costs (excluding TA expenses) are estimated at 15,000 USD for production of a toolkit, training-of-trainers, and pilot sessions at the commune level; 10,000 USD for 2 FWUC training sessions; 6,300 USD for a visit to the Cuu Long Delta; and 4,700 USD for a return visit; totalling around 36,000 USD for the entire suite of proposed activities.

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### ***In Preah Sihanouk***

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### ***In Koh Kong***

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# 1 Introduction

This paper is related to Outcome 2 of the CARP: *'Increased resilience of coastal communities and coastal ecosystem buffers to climate change and improved livelihoods'*.

Specifically, it is related to the following activities:

*'Capacity of the local government strengthened in order to implement climate change adaptation and climate risk reduction activities';*

*'Development of awareness, outreach and training materials for community members';* and

*'Assessment of training needs and implementation of training in FWUCs with regards to climate risk management; involving local authorities'.*

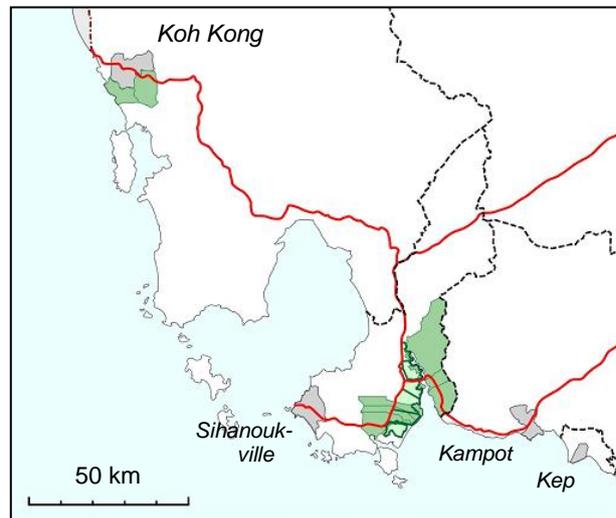
The work is based on a series of consultations with government bodies, farmers, fishermen and others in Preah Sihanouk and Koh Kong in May and June 2012, with subsequent reporting under the CARP.

The present concept note presents suggestions in the specific context of the coastal climate adaptation needs and the CARP pilot area.

## 2 Context

The pilot area consists of low-lying communes in Mondol Seima District, Koh Kong Province, and Prey Nob District, Preah Sihanouk Province.

Figure 1: The CARP pilot area



Map compiled from different sources.

Administrative borders, commune codes and English spelling of names are from NIS (March 2012)

The coastal zone has its own distinct agenda for climate adaptation, as compared with the Mekong Basin parts of Cambodia.

The pilot area is characterized by <sup>1</sup>

- paddy cultivation as the predominant (and traditional) livelihood; but otherwise with a diversified, resource-based economy, including livestock, fisheries, some aquaculture, and services to tourists;
- moderate yields and small land holdings;
- damage caused by insects, birds and rats; and high post-harvest losses;
- soil degradation caused by inorganic fertilizers
- inappropriate use of pesticides (partly due to lack of instructions from the manufacturers), causing fish deaths and (sometimes) human sickness (as well as, presumably, unnecessary environmental pollution)

<sup>1</sup> For details, please refer to CARP (July 2012)

- exposure to cross-border trade (and price competition) related to agricultural inputs, rice, livestock and seafood, amplified by low production efficiencies;
- exposure - reportedly escalating - to storms and extreme rainfalls. (Drought is not a major issue today, but may emerge if the weather irregularities expand further);
- sea level rise, land subsidence and saline intrusion; and
- increasing related challenges regarding salinity control and storm water drainage.

#### ***Rice cultivation in Cambodia***

Over the 12 years from 1998/99 to 2009/10, Cambodia's rice production increased by 110 percent. This is due to a 26 percent increase in cultivated rice area and a 40 percent increase in crop yield. The country is now self-sufficient with rice, with a surplus that can be exported. In the first half of 2011, Cambodia exported 80,400 tonnes of rice, four times the amount in the first year of 2010.

This development started from a low base. Cambodia could be expected to have a particular expertise in irrigated rice cultivation - the Western Baray system near Angkor Wat was built around 1050 and is still in operation - but much of the knowledge was lost during the disastrous years of Pol Pot (1975-79).

The subsequent restoration had irrigation as a main component, and a benevolent donor community invested heavily in restoration of defunct schemes and construction of new ones.

In many cases, unaware or sceptical of the new possibilities, the farmers continued with their traditional cultivation: One rainfed crop per year, with (highly appreciated) supplementary irrigation provided by the new systems during dry spells. Most of the irrigation infrastructure - 60 percent - is used in this way - much better than nothing, but providing small returns on the investments, and with a clear scope for improvement.

*Source: Yem Dararath (November 2012), quoting various sources*

### 3 CC education and awareness-building

Two closely related activities are proposed:

- Training-of-trainers
- Pilot education and awareness-building sessions at commune level

#### 3.1 Rationale

Cambodia's Human Development Report 2011<sup>2</sup> is dedicated to *'Building resilience: The future of rural livelihoods in the face of climate change'*. On its first page, it notes that *'climate change is as much a human development issue as it is an environmental issue'*.

The need of human development (and institutional capacity) is amplified by the ongoing decentralization and deconcentration programme, supported by the National Committee for Sub-National Democratic Development (NCDD), which aims at increased sub-national participation in development and investment planning and related decision-making.

Consultations conducted under the CARP in May and June 2012 confirmed a broad need of improved knowledge about CC implications and adaptation options, from the province level to the district, commune, village, and indeed household level, supported by training-of-trainers.

This is the background for CARP activities aiming at strengthened local government capacity, and development of awareness, outreach and training materials for community members.

#### 3.2 An awareness and education kit

A kit for CC education and awareness-building was produced and successfully implemented under the NAPA Follow-up Project by Save Cambodia's Wildlife (SCW) in collaboration with MAFF, UNDP and GEF.

A cornerstone of the kit is a flip chart, consisting of 34 thematic pages, covering CC impacts, CC mitigation and adaptation, safe water and sanitation, waste disposal, rural livelihoods, resource conservation, and urban implications.

The front sides of each sheet sides are nice artistic drawings in colour with CC-related themes (without texts), while the rear sides (in greyscale) are explanatory notes (with concepts, figures and diagrammes in Khmer). A presenter can show the front side to a group of trainees while using the notes on the rear side for guidance. An example of a sheet is shown in Appendix A.

Also, a *'pocket version'* has been produced, as well as a DVD with video presentations (in Khmer). The material is not commercially available.

The flip chart was developed with a view to education of extension workers and communities. In reality, it could serve as a tool for discussion from kindergarten to university level. It is very clearly based on the Cambodian CC agenda, but does not cover the specific coastal zone challenges and adaptation needs.

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<sup>2</sup> by MOE and UNDP (August 2011)

It is well suited for adaptation for use in the coastal zone, if it is modified to include themes relevant to the coastal zone agenda for CC preparedness and adaptation.

Figure 2: The SCW flip chart



### **Save Cambodia's Wildlife (SCW)**

SCW was established and registered with Ministry of Interior in July 2002. SCW was initially based in Takeo Province and activities in the first few years included the provision of technical support to Phnom Tamao Rescue Centre, and increasing environmental awareness both within the wildlife rescue centre and with the general public. Back then and up to the present, SCW uses teaching programs, study tours, book publications, videos, presentations and environmental awareness campaigns to educate all levels of society, particularly focusing on youth, children and rural villagers.

SCW seeks to protect and conserve natural resources and wildlife habitats by:

- (i) Research, publications and educational programs
- (ii) Promoting efficient alternative livelihood support programs
- (iii) Raising public awareness about CC concerns and promoting community-based CC adaptation and mitigation

*Information from the SCW website: [www.cambodiaswildlife.org](http://www.cambodiaswildlife.org)*

### 3.3 Proposed activities

The following activities are proposed under the CARP:

- Amendment of the flip chart to add coastal themes, such as sea level rise; coastal/river mouth erosion; saline intrusion; mangrove habitats; sea grass and coral habitats; and perhaps coastal infrastructure. (Soil deterioration and urban drainage would be other candidate themes, but could end up with being too much). (The highly relevant topics of floods and storms are covered already).
- Skipping some of the existing pages, in order to obtain a concise and manageable toolkit, possibly ending up with around 24 pages.
- Preparation of 3 sets of handouts, largely reflecting the rear sides of the flip chart pages, and clearly related to each page of the flip chart: One comprehensive set of notes in Khmer; a similar set in English; and a set of concise notes in Khmer.
- Training-of-trainers from the PWGs (2 sessions, one in each target province), based on preliminary versions of the revised flip chart.
- Pilot implementation at commune/village level (4 sessions, two in each target province), with feedback from participants and trainers.
- Adjustment of the kit (presumably mainly the handouts rather than the flip chart itself).
- Production of 50 flip charts.
- Evaluation and reporting.

### 3.4 Objectives

The direct objective of the training-of-trainers and the pilot sessions is to achieve

*improved understanding of CC-related challenges and options in the context of the coastal zone, first among the PWGs and, subsequently, among local communities.*

The over-all objective is to establish

*a model for context-specific, CC-related, inexpensive community education and awareness-building, suited for implementation by the PWGs.*

### 3.5 Implementation

Development of an amended flip chart and handouts will be undertaken by SCW in dialogue with the PWGs and with technical support by the TA team. Hereby, the finalization of the toolkit will take place interactively with the training-of-trainers.

Training-of-trainers (from the PWGs) will be undertaken by SWC, who will also participate in the initial pilot applications.

The PWGs will undertake subsequent routine applications in the communes.

### 3.6 Next steps

The next steps may comprise

- 1 Formal approval of the activity
- 2 Agreement with SCW on their contributions
- 3 Detailed planning
- 4 Upgrading of the flip chart and drafting of handouts
- 5 Training-of-trainers, back-to-back with pilot implementation at commune level
- 6 Adjustment of handouts (and, if needed, the flip chart itself)
- 7 Production and dissemination of flip charts and handouts
- 8 Evaluation and reporting

## 4 FWUC strengthening

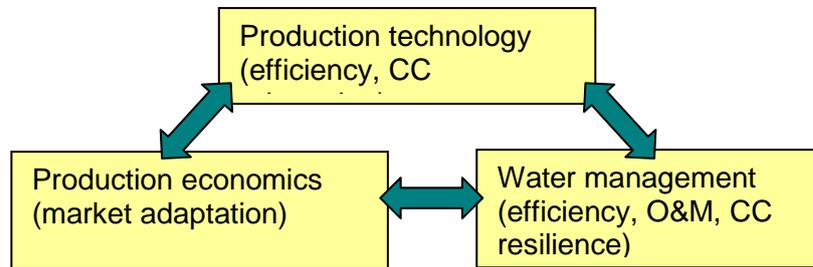
### 4.1 Training needs

Training needs were identified and evaluated during consultations under CARP in May and June 2012. The list is long:

- Water-sharing and water allocation management
- Irrigation system operation and management
- Drainage and salinity control
- Safe water and sanitation
- Soil management
- Tree-planting (for storm protection and other benefits)
- Disaster preparedness: Floods and storms
- Participatory monitoring of climate vulnerability and exposure
- Drought preparedness (Not an issue today, but the area is unprepared if and when a drought occurs)
- Choice of seeds, including short-term and high-yield varieties
- Shift from one to two crops per year
- Use of pesticides and fertilizers
- Livestock; aquaculture. In the pilot area, some farmers are quite successful, while others are less so. There is a clear scope for learning from each other
- Small-scale supplementary dry season cultivation
- Post-harvest processing and marketing
- Access to credit/savings/insurance

All these are related to climate resilience/climate adaptation - in some cases directly and in other cases indirectly.

Figure 3: FWUC capacity-building agenda



Only selected (priority) needs will be accommodated during the pilot training proposed in the present paper, as elaborated in the following chapter.

The Prey Nob FWUC is well operated by any standard (and as compared with many other Cambodian FWUCs). It is not in need of basic training.

#### 4.2 Overview of proposed activities

Two independent activities are proposed:

- Two pilot FWUC training sessions, one in each province, each with a duration of 3 days, with 18 FWUC representatives participating in each session, with briefings on CC concerns and management options, and one day allocated for a site visit.
- A study exchange visit to Cuu Long Delta, with 24 participants (16 government employees and 8 FWUC representatives), and a return visit with 8 participants.

#### 4.3 Objectives

##### ***Pilot training sessions***

The direct objective of the pilot sessions is to achieve

*improved awareness and understanding of CC-related challenges and options within CC resilient irrigation management and cultivation technology.*

The over-all objective is to establish

*a model for context-specific, CC-related, inexpensive FWUC training, suited for implementation by the PWGs.*

##### ***Exchange visits***

The direct objective is to achieve understanding of proven technology and management options related to

*salinity control of paddy fields; and high-yield double (or triple) cropping; from a environmental setting that is similar to the one in the CARP area.*

The over-all objective is to

*strengthen the capacity of PWGs, provincial departments and the Governors' offices to meet climate-related, socio-economic development needs and opportunities by climate-resilient production systems and infrastructure.*

Hereby, it is expected that the exchange visits can add to the basis for the sub-national development planning.

#### **4.4 Outline of training sessions**

Rice cultivation in the pilot area is in a stage of transition piloted by entrepreneurial farmers, from traditional long-term and low-yield (but tasty!) varieties, with one crop per year, to more contemporary (and climate-resilient) short-term and high-yield varieties. Most experience is from other parts of the country, where conditions are different. The transition can be supported by exchange of knowledge from elsewhere, as well as within the pilot area.

On this background, the rationale of the training sessions is to learn from each other, exchanging experience and ideas between and among farmers and PWG members.

A 3-days programme is proposed:

Day 1: Introduction; briefings by provincial departments, Prey Nob FWUC, CARDI and the TA consultant; welcome dinner

Day 2: Site visit to irrigated paddy fields/FWUCs/Farmers Associations in each province, including the Prey Nob Polder and (expectedly) Tuol Kokir

Day 3: Panel and plenary discussions, conclusions and recommendations

The pilot training is intended as a starting point for replication. A feedback survey will be conducted, possibly as outlined in Appendix E, in support of improvements.

Please refer to Appendix C for details.

#### **4.5 Outline of study exchange visit**

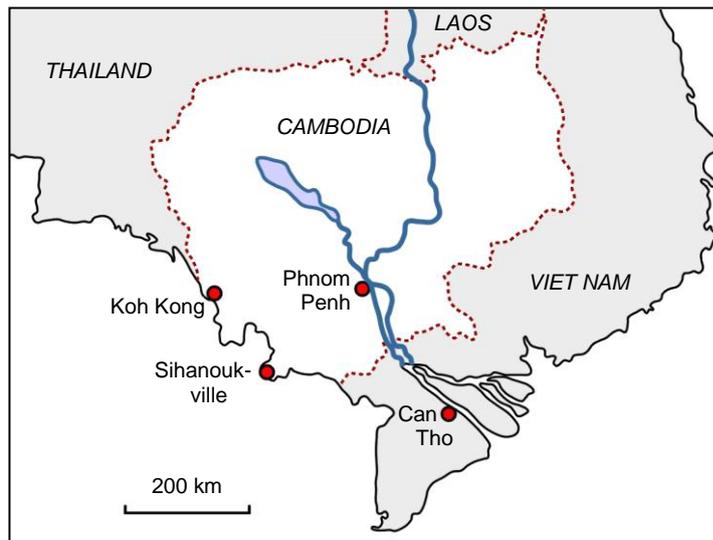
The Cuu Long Delta is located 2-300 km from the target area. It is exposed to seasonal (dry season) sea water intrusion, affecting irrigation and urban water supplies. Irrespectively, the Delta is intensely cultivated, with rice yields around 4 t/ha in the wet season and 6 t/ha in the dry season, along with fruit trees and aquaculture.

The new climate-related challenges to paddy farmers in Cambodia's coastal zone are well known in the Cuu Long Delta (the Vietnamese part of the Mekong Delta), where the Mekong meets the sea. Experience has been built over decades in salinity control, soil management, and brackish water production systems other than rice cultivation. Technologies have been adapted with support from the scientific community and governmental technological service institutes.

There is a clear scope for gaining insight in this experience for the purpose of Cambodia's coastal zone. For the purpose, one study visit and one return visit are proposed:

- A 4-days visit by representatives from provincial departments and the governors' offices, and some FWUC representatives
- A 2.5 days return visit by Vietnamese resource persons for review of impressions and lessons learned on the background of the Cambodian development agenda

Figure 4: Key map



#### ***The Cuu Long Delta at-a-glance***

Area: 39,000 km<sup>2</sup>; population: 17.3 million people (2011); 13 provinces/ municipalities; largest city: Can Tho (1.2 million people, 2011).

#### ***Economy:***

80 percent of the population is engaged in rice cultivation. Yields exceed 5 t/ha/crop, with 2-3 crops per year. Other production systems are aquaculture (fresh and saline water), shrimp cultivation in paddy fields, livestock, cash crops and fruit trees.

#### ***Present and projected climate threats:***

- Saline intrusion, coast/bank erosion and inundation caused by sea level rise
- Droughts caused by less rainfall
- El Niño-related droughts occur occasionally
- Saline intrusion into the mouths of the Mekong occurs every year in the dry season, to an extent that varies from year to year, depending on the actual Mekong flow

#### ***Research and technological service institutes:***

Cuu Long Delta Rice Research Institute, Can Tho  
 Southern Institute of Water Resource Planning (SIWRP), HCMC  
 Southern Institute of Water Resources Research (SIWRR), HCMC  
 Cantho University: Faculty of Agriculture; Faculty of Technology

Source: Wikipedia and other Internet resources

Results should be duly reported and disseminated in support of improved climate resilience of production systems, and to be carried forward to the sub-national development planning in the coastal zone. Hereby, the PWGs will serve as catalysts.

Please refer to Appendix D for details.

#### **4.6 Implementation**

The activities will be implemented by the Provincial Working Groups, with initial support from CARP.

Active participation has been assumed by

- Provincial Department of Environment (involved in CC adaptation)
- Provincial Department of Agriculture (involved in cultivation technology)
- Provincial Department of Water Resources (involved in irrigation system operation)
- The Provincial Governors' Offices
- The Prey Nob FWUC
- CARDI
- Perhaps a rice miller

##### ***In Viet Nam:***

- Southern Institute of Water Resource Planning (SIWRP), and/or Southern Institute of Water Resources Research (SIWRR); and/or
- Can Tho University: Faculty of Agriculture, and/or Faculty of Technology

#### **4.7 Next steps**

The next steps may comprise

- 1 Formal approval of the activity
- 2 Agreements with implementation partners/resource persons
- 3 Preparatory visits to each province
- 4 Identification of trainees (jointly with PWGs/provincial departments)
- 5 Implementation
- 6 Evaluation and reporting

## **5 Related activities**

The proposed activities are related to (and will conveniently complement and add value to) other climate-related capacity development initiatives (in preparation) under the CARP and beyond, aiming at strengthening of the provincial departments and the Governors' offices in general, and the PWGs in particular, as well as building commune-level and farm-level awareness of climate-related challenges and adaptation options.

The proposed CC education and awareness-building pilot activities are well suited for routine replication (by the PWGs) beyond the CARP. In the course of time, the activities could be expanded to schools.

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# Appendix A: A sheet from the SCW flip chart



<b>ខ្លឹមសារ</b> ២	<b>ទំព័រ</b> ២	<b>តើអ្វីជាភារកិច្ចប្រែប្រួលអាកាសធាតុ?</b>	<b>ស្ថានភាពអាកាសធាតុប្រក្រតី</b> 
<p><b>គោលបំណង:</b>          ដើម្បីឱ្យប្រជាពលរដ្ឋក្នុងមូលដ្ឋានយល់ដឹងអំពីស្ថានភាពប្រែប្រួលអាកាសធាតុបច្ចុប្បន្ន ក្នុងនោះមាន ការកើនឡើងកម្ដៅ គ្រោះរាំងស្ងួតញឹកញាប់ ការប្រែប្រួលពេលវេលាធ្លាក់ភ្លៀង ភ្លៀងធ្លាក់ខ្លាំង និងទឹកជំនន់ញឹកញាប់។</p> <p><b>វិនិស្ស័យ:</b> សំនួរលំដាប់គំនិត ផ្ទាំងរូបភាព</p> <p><b>ជំហាន:</b>          ក. សំនួរលំដាប់គំនិត:          ១. តើស្ថានភាពអាកាសធាតុក្នុងរយៈពេល ១០ឆ្នាំមុនក្នុងតំបន់របស់អ្នកយ៉ាងដូចម្ដេចដែរ?          ២. តើការប្រកបរបរចិញ្ចឹមជីវិត ជាពិសេស កសិកម្ម និងការប្រើប្រាស់ទឹកយ៉ាងដូចម្ដេច?          ៣. តើអ្នកសង្កេតឃើញស្ថានភាពអាកាសធាតុបច្ចុប្បន្នយ៉ាងដូចម្ដេច?          ៤. តើស្ថានភាពអាកាសធាតុបច្ចុប្បន្នខុសប្លែកពីស្ថានភាពពីមុនយ៉ាងដូចម្ដេច?          ខ. លើកទឹកចិត្តឱ្យអ្នកចូលរួមបានបញ្ចេញយោបល់ បន្ទាប់ពីសួរសំនួរនីមួយៗ ដោយបញ្ជាក់ថា រាល់ចម្លើយដែលបានលើកឡើងមិនខុសទេ។          គ. ពន្យល់ និងបកស្រាយលើសំនួរនីមួយៗ ដោយផ្អែកលើខ្លឹមសារនៅក្នុងសេចក្ដីពន្យល់ ជាមួយនឹងការបញ្ជាក់ផ្ទាំងរូបភាព។</p>			<p>ជាធម្មតា អាកាសធាតុមានភាពប្រក្រតី និងមានភាពទៀងទាត់ ដូចជាមានភ្លៀងធ្លាក់ទៀតទាត់តាមរដូវកាល ដែលអាចឱ្យប្រជាពលរដ្ឋនៅជនបទអាចធ្វើ កសិកម្ម ដាំដុះទៀងទាត់តាមរដូវកាលដោយភាគច្រើនពឹងផ្អែកលើរបបទឹកភ្លៀងតាមធម្មជាតិ។ ជាងនេះទៀត រយៈពេលនៃកូនរដូវក្ដៅមិនមានរយៈពេលយូរអួសបន្លាយ ដែលអាចធ្វើឱ្យប៉ះពាល់ដល់ប្រភពទឹកស្រាបៀបប្រាស និងសម្រាប់ធ្វើកសិកម្មទេ។ ចំណែកឯ របៀបនៃការធ្វើកសិកម្ម ទាំងការដាំដុះ និងការចិញ្ចឹមសត្វធ្វើទៅតាមទម្លាប់ពីបុរាណ។ ចំពោះរបបទឹកទន្លេមេគង្គ ក៏មានភាពទៀតទាត់ទៅតាមទំនាក់ទំនងនៃរបបទឹកភ្លៀង និងរដូវកាលផងដែរ។ កត្តាចម្រុះ និងជំងឺឆ្លងបណ្តាលមកពីលក្ខខណ្ឌអាកាសធាតុមានគិតតួចតើមានលើសត្វចិញ្ចឹម និងដំណាំ។ ស្ថានភាពអាកាសធាតុប្រក្រតីក្នុងពេលមុន ស្របគ្នានឹងបរិស្ថាន ធម្មជាតិនៅសម្បូរបែបមិនមានបង្កឱ្យមានបញ្ហាប្រឈមចំពោះជីវភាពរបស់នៅរបស់ប្រជាពលរដ្ឋក្នុងមូលដ្ឋានទេ។</p>

## Appendix B: CC education and awareness-building

<b>Title:</b>	<b>Community training in CC implications</b>
<b>Objective:</b>	Improved understanding of CC-related challenges and options in the context of the coastal zone, first among the PWGs and, subsequently, among local communities.
<b>Background:</b>	<p>Recent consultations in the CARP target provinces confirmed a clear and present need of CC education and awareness-building.</p> <p>Two closely related activities are proposed: Training-of-trainers (from the PWGs); and pilot education and awareness-building sessions at commune level.</p> <p>The training-of-trainers (from the PWGs, representing provincial departments) will contribute to CC-related skills development at the province level.</p> <p>The pilot implementations will contribute to local awareness and understanding of CC-related challenges and adaptation options. They are intended as a starting point for replication.</p>
<b>No. of sessions:</b>	<p><i>Training-of-trainers:</i> 2 sessions, one in each province</p> <p><i>Pilot implementation at community level:</i> 4 sessions, two in each province</p>
<b>Participation:</b>	<p><i>Training-of-trainers:</i> In total, around 12 PWG members, representing relevant provincial departments.</p> <p><i>Pilot implementation at community level:</i> In total, around 48 commune/village representatives, with adequate female participation</p>
<b>Programme:</b>	<p><i>In each province:</i></p> <p>Training-of-trainers (1 day); back-to-back with pilot implementation at commune level and evaluation (2 days), totalling 3 days in each province.</p>
<b>Proposed topics (long-list, for further consideration):</b>	<ul style="list-style-type: none"> <li>• Safe water and sanitation</li> <li>• Orderly sewage and solid waste disposal</li> <li>• Resource conservation</li> <li>• Choice of seeds, including short-term and high-yield varieties</li> <li>• Shift from one to two crops per year</li> <li>• Use of pesticides and fertilizers</li> <li>• Livestock; aquaculture</li> <li>• Small-scale supplementary dry season cultivation</li> <li>• Salinity control</li> <li>• Soil management</li> <li>• Tree-planting (for storm protection and other benefits)</li> <li>• Disaster preparedness: Floods and storms</li> </ul>

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	<ul style="list-style-type: none"> <li>• Post-harvest processing and marketing</li> <li>• Access to credit/savings/insurance</li> </ul>
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<b>Implementation:</b>	<p>SWC will prepare the toolkit, and conduct training-of-trainers, with support from the CARP team.</p> <p>The PWGs will receive training and will conduct the commune-level pilot sessions with support from SCW and the CARP team.</p>
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<b>Activities:</b>	<p>One suite of sessions in Preah Sihanouk Province</p> <p>One suite of sessions in Koh Kong Province</p> <p>Documentation and reporting</p>
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<b>Technical support:</b>	<p>Technical support from the provincial departments and the Governors' Offices will be relayed via the PWGs</p>
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<b>Timing:</b>	<p>December-January</p>
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<b>Documentation:</b>	<p>Adequate documentation (in Khmer) will be provided, in support of replication</p> <p>A feedback survey of the quality and the relevance of the training will be conducted during the pilot sessions</p>
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<b>Budget, excluding TA expenses:</b>	<p>The budget is in preparation. At this stage, the costs are estimated at</p> <p style="text-align: right;"><b>15,000 USD</b></p>
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## Appendix C: FWUC training

<b>Title:</b>	<b>FWUC training in CC implications</b>
<b>Objective:</b>	Improved awareness and understanding of CC-related challenges and options within <ul style="list-style-type: none"> <li>• CC resilient irrigation management; and</li> <li>• cultivation technology</li> </ul>
<b>Background:</b>	<p>Rice cultivation in the pilot area is in a stage of transition piloted by entrepreneurial farmers, from traditional long-term and low-yield (but tasty!) varieties, with one crop per year, to more contemporary (and climate-resilient) short-term and high-yield varieties. Most experience is from other parts of the country, where conditions are different. The transition can be supported by exchange of knowledge from elsewhere, as well as within the pilot area.</p> <p>The pilot training is intended as a starting point for replication.</p>
<b>Participation:</b>	25 farmers from the pilot area, identified by the districts/communes, with adequate female representation
<b>No. of sessions:</b>	2 (one in each target province)
<b>Programme:</b>	<p>3 days:</p> <p>1: Introduction Briefings by provincial departments, Prey Nob FWUC, CARDI and the TA consultant</p> <p>2: Site visit to irrigated paddy fields/FWUCs/Farmers Associations in each province, including the Prey Nob Polder and (expectedly) Tuol Kokir</p> <p>3: Panel and plenary discussions, conclusions and recommendations One joint dinner will be included as a part of the programme Lunch will be provided on each day</p>
<b>Proposed topics</b> (for consideration; please refer to Chapter 3 for a long-list):	<p>CC resilient irrigation system operation and management</p> <p>Drainage and salinity control</p> <p>Soil management</p> <p>Disaster preparedness: Floods and storms</p> <p>Choice of seeds, including short-term and high-yield varieties</p> <p>Use of pesticides and fertilizers</p>
<b>Implementation:</b>	The provincial working group, collaborating with Departments of Agriculture and Water Resources, and the Prey Nob FWUC; with initial support from CARP

<b>Activities:</b>	<p>One preparatory visit to each province, meeting the Provincial Working Groups, province departments, and the Prey Nob FWUC</p> <p>One training session in Preah Sihanouk Province</p> <p>One training session in Koh Kong Province</p> <p>Documentation and reporting</p>
<b>Technical support:</b>	<p>Provincial Departments of Environment</p> <p>Provincial Departments of Agriculture</p> <p>Provincial Departments of Water Resources</p> <p>The Provincial Governors' Offices</p> <p>CARDI</p> <p>Perhaps a rice miller</p>
<b>Timing:</b>	December-March (Considering the typical cultivation cycle)
<b>Documentation:</b>	<p>Adequate documentation (in Khmer) will be provided, in support of replication</p> <p>A feedback survey will be conducted of the quality and the relevance of the training</p>
<b>Budget, excluding TA expenses:</b>	The budget estimate includes cost of participants transport, meeting rooms, buses, presentation facilities, reporting of outcome. The budget including contingencies is estimated at 5,000 USD per session and totally 10,000 USD.

## Appendix D: Study tour to the Cuu Long Delta

<b>Title:</b>	<b>Study tour: Salinity control for rice cultivation</b>
<b>Objective:</b>	<p>Knowledge-sharing about</p> <ul style="list-style-type: none"> <li>• salinity control of paddy fields; and</li> <li>• high-yield double (or triple) cropping</li> </ul>
<b>Background:</b>	<p>The Cuu Long (Mekong) Delta is located 2-300 km from the target area. It is exposed to seasonal sea water intrusion. Irrespectively, the Delta is intensely cultivated, with rice yields around 4 t/ha in the wet season and 6 t/ha in the dry season, along with fruit trees and aquaculture.</p> <p>Saline intrusion is a new threat in Cambodia's low-lying coastal areas. Highly relevant lessons can be learned from the Delta.</p>
<b>No. of sessions:</b>	<p>1 study tour</p> <p>1 return visit</p>
<b>Participation:</b>	<p><i>Study tour:</i></p> <p>16 resource persons from the provinces</p> <p>8 FWUC representatives from the pilot area, to be identified, with adequate female representation</p> <p><i>Return visit:</i></p> <p>8 resource persons (from Viet Nam)</p>
<b>Programme:</b>	<p><i>Study tour, 4 days:</i></p> <ol style="list-style-type: none"> <li>1: Transfer</li> <li>2: Briefings by Vietnamese hosts; site visit</li> <li>3: Site visit (continued); plenary discussion, conclusions and recommendations</li> <li>4: Return travel</li> </ol> <p>One joint dinner will be included as a part of the programme</p> <p>Lunch will be provided on each day</p> <p><i>Return visit, 2.5 days:</i></p> <ol style="list-style-type: none"> <li>1: Introduction, welcome dinner</li> <li>2: Visit to Prey Nob (and perhaps elsewhere)</li> <li>3: Seminar: Introductions about rice cultivation and salinity control; plenary discussion; wrap-up</li> </ol>
<b>Proposed topics</b> (for consideration; please refer to Chapter 3 for a long-list):	<p>Water-sharing and water allocation management</p> <p>CC resilient Irrigation system operation and management</p> <p>Drainage and salinity control</p> <p>Soil management</p> <p>Choice of seeds, including short-term and high-yield varieties</p> <p>Use of pesticides and fertilizers</p>



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**Facilities**

Meeting room, LCD projector	200 USD
Interpreter	300 USD
Bus	150 USD

**Consumables**

Documents, handouts	100 USD
Other consumables	1600 USD

<b>Contingencies</b>	1000 USD
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**Total, 1 return visit** **5,050 USD**

**Total, visit + return visit** **11,450 USD**

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## Appendix E: Feedback from participants

*(Outline, to be re-engineered, in Khmer)*

<b>General</b>	😊	😐	😞		
Was the seminar useful in relation to your work?	<input type="checkbox"/>				

<b>Overheads and documents</b>	😊	😐	😞		
Did the material have a suitable professional level?	<input type="checkbox"/>				
Was it easy to understand?	<input type="checkbox"/>				
Did it include subjects that are useful to you?	<input type="checkbox"/>				

<b>Excursion</b>	😊	😐	😞		
Were the excursion interesting to you?	<input type="checkbox"/>				
Did you learn anything new and useful?	<input type="checkbox"/>				

<b>Plenary session/group discussions</b>	😊	😐	😞		
Were the subjects for discussion of interest to you?	<input type="checkbox"/>				
Were the discussions useful in relation to your work?	<input type="checkbox"/>				

<b>Comments or suggestions</b>

*Thank you very much!*

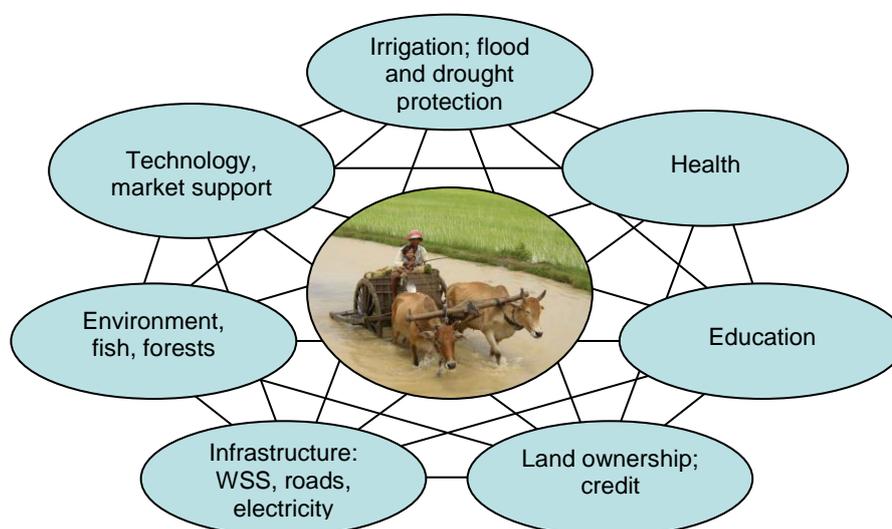
## Appendix F: A multi-sector approach

*Entire appendix quoted from Yem Dararath (November 2012)*

The diverse needs of the FWUCs of skills and knowledge span across sectors and administrative sector boundaries. For example, in Cambodia (since 1998), irrigation and agriculture are under different ministries (like it is the case in several other Asian countries). Other ministries are responsible for rural development; land use; and the environment.

This can work well, provided that an active collaboration is maintained both at the national and de-central level. Cambodia's impressive increase in rice production has been achieved partly by expanding the irrigation infrastructure (by MOWRAM) and by improving the yield (by MAFF). Joint efforts add value to each other.

*Figure 5: Irrigation is not enough!*



This is reflected by recent national cross-cutting strategies:

- MAFF and MOWRAM February 2007: Joint strategy for agriculture and water 2006-2010, not widely observed, but renewed in April 2010 to cover 2010-13; and
- RGC July 2010: Policy on promotion of paddy rice production and export of milled rice (approved by the Council of Ministers).

Such strategies are well suited for improving the revenues from cultivation, to the benefit of the country and its farmers.

The current national '*Rectangular Strategy*' has four strategic '*growth rectangles*', all of which are directly related to strengthening of FWUCs:

- (1) Enhancement of the agricultural sector;
- (2) further rehabilitation and construction of the physical infrastructure;
- (3) private sector development and employment; and
- (4) capacity building and human resource development.