

Final

Guidelines for Integrating Climate Change Considerations into Commune Development Planning - General



Cambodia Climate Change Alliance (CCCA)

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January

2014

Acknowledgement

This Guideline was produced under the Coastal Adaptation and Resilience Planning Component funded by the Cambodia Climate Change Alliance Program.

The Team gratefully acknowledges the support and guidance provided by HE Dr. Say Samal, Minister of Environment, HE Dr. Mok Mareth, Former Senior Minister and Minister of Environment; HE Dr. Lonh Heal, Director General of MOE; Dr. Tin Ponlok, Head of Trust Fund Secretariat, MOE; Mr. Sum Thy, Director of Climate Change Department, MOE, and Dr. Vann Monyneath, National Project Coordinator, MOE.

A smooth formal collaboration and informal dialogue has been maintained with CCCA, sharing information, ideas and findings.

The Team sincerely thanks everyone who shared their time and knowledge, and looks forward with enthusiasm and confidence to a continued fruitful dialogue.

This Guideline has been developed based on a number of on-going activities conducted in 2012 to late 2013 and a number of persons have been involved in this or part of this work.

In addition, the following persons (listed by order of alphabet) kindly shared their information and provided data and ideas:

In Preah Sihanouk

Mr. Chea Saly, Chief of Agronomy Office, DOA; ms. Chim Kalyan, Deputy Director, DOE; mr. Chum Chanthol, Chief of Agricultural Extension Office, DOA; mr. Chun Sun Heng, Vice Chief, Tuek L'ak Commune; mr. Heng Sophornrith, Deputy Director, DOWRAM; mr. Khuy Khay, council member, Tuek L'ak Commune; mr. Ngoy Peng Chiv, Deputy Director, DRD; mr. Nos Orn, Vice Chief, Tuek Thla Commune; mr. Nu Ramy, Executive Director, Prey Nob FWUC; mr. Ork Song Horn, Deputy Director, Prey Nob District; mr. Oun Em, Officer, Prey Nob District; mr. Prack Sarim, Chief, Sameakki Commune; and mr. Yim Boy, Chief, Prey Nob FWUC.

In Koh Kong

Mr. Ben Vanna, Deputy Governor, Mondul Seima District; mr. Chey Yoen, community member, Peam Krasaob Commune; mr. Chhiv Reth, Vice Chief, Fisheries Office; mr. Chut Tit, Commune Chief and Community Chief, Peam Krasaob Commune; mr. Em Yoen, community member, Peam Krasaob Commune; mr. Ev Vanna, Deputy Director, DOWRAM; mr. Hun Marady, Deputy Director, DOE; mr. Khoem Sanith, First Vice Chief, Toul Kokir Commune; mr. Leng Chan Sokthear, Officer, Agronomy Office; mr. Moun Phala, Acting Director, DOE; ms. Neang Kun, First Vice Chief, Peam Krasaob Commune; mr. Phong Livireak, Director, DOA; mr. Prark Dina, Commune Secretary, Toul Kokir Commune; mr. Seng Bunna, Officer, Fisheries Office; mr. Siak Samoun, Vice Community Chief, Peam Krasaob Commune; mr. Som Chea, Deputy Director, DRD; mr. Soun Noun, Chief of Veterinary Office, DOA; mr. Ty Vech, Commune Secretary, Peam Krasaob Commune; and mr. Yem Yan, Vice Chief, Peam Krasaob Commune.

In Phnom Penh

Mr. Julian Abrams, Local Development Consultant; Mr. Chhor Elett, Office Chief, Department of Environmental Education and Training, MOE; mr. Dara Rat Moni Ung, Agriculture Portfolio and Policy Adviser, UNDP/IFAD; mr. Ek Menrith, Chief of GIS Office, Department of Natural Resource Assessment and Data Management, MOE; mr. Hok Kimthourn, National Project Manager; Project Support Unit, MAFF; mr. Im Sophanna, Vice Chief of Weather Observations,

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MOWRAM; dr. Khay Sathya, Plant Protection Office, CARDI; mr. Meas Bunly, National Communication Officer, NAPA Follow-up Project/UNDP; ms. Mom Savy, Department of Environmental Education and Training, MOE; dr. Muong Sideth, Project Officer, Agence Française de Développement (AFD); mr. Oeurn Piseth, Agricultural Land Resource Management Department, MAFF; mr. Ou Sophorn, Vice Chief, EIA Department, MOE; mr. Ouk Vibol, Acting Director, Dept. of Fisheries Conservation, MAFF; mr. Oum Ryna, Acting Director, Department of Meteorology, MOWRAM; mr. Suos Pinreac, National Project Adviser, NAPA Follow-up Project, MAFF; mr. Tong Bunthoeun, Deputy Director, Department of Wetlands and Coastal Zone, MOE; mr. Touch Veasna, Soil and Water Science Office, CARDI; and mr. Ung Soeun, Senior Agricultural Officer, Agricultural Land Resource Management Department, MAFF.

Manual Chapters

No.	Title	Outputs	Inputs
1.	Introduction	What the Guidelines Do and Don't Do	
2.	Planning Context	Review of proposed National, Provincial and/or District plans/projects/policies which may impact upon the Commune	Higher level plans from agencies
3.	Use of Statistics	An understanding of how to interpret Commune Data Books. Consider IDPoor data.	Commune/IDPoor Data (2004 – 12)
4.	Population	An understanding of population dynamics in terms of growth rates, household formation, migration, gender & vulnerable persons.	Population Data (2006 – 12)
5.	Economy	An understanding of the economic structure of the commune and how/why this may have changed.	Economic Data (2006 – 12)
6.	Housing & Utilities	An understanding of changes in the quality of housing and access to utilities and how/why this may have changed.	Housing and Utilities Data (2006 – 12)
7.	Accessibility	An understanding of how accessibility within/from the Commune has changed.	Access Data (2006 – 12)
8.	Identified Issues	A review of issues previously identified and mapped by the Commune and which affect living and working conditions.	Issues Map & Chapters 3 – 7
9.	Land Use Planning & Climate Change Adaptation	An understanding of how Climate Change may result in a need for the Commune to adapt to changing circumstances.	Topographical Data & Chapters 3 – 8
10.	Disaster Risk Management	A review of the Commune's preparedness for extreme weather events.	Commune Feedback
11.	Inputs to Commune Development Planning	Map and description of future projects considered by the Commune to be relevant in addressing Climate Change and extreme weather event concerns in the area.	Projects Map & Chapters 3 – 10

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- Annex 1: Commune Data Book Extracts
- Annex 2: Data from IDPoor Surveys (2004 – 12)

Acronyms and Abbreviations

AAGR	Average Annual Growth Rate
CAEA	Commune Agro-Ecosystems Analysis
CARP	Coastal Adaptation and Resilience Planning Component
CCCA	Cambodia Climate Change Alliance
CDP	Commune/Sangkat Development Plan
CIP	Commune/Sangkat Investment Program
CLUP	Commune Land Use Planning
DRM	Disaster Risk Management
EC	Elevation Code
IDPoor	Identification of Poor Households Programme
MLMUPC	Ministry of Land Management, Urban Planning and Construction
NCDD	National Committee for Sub-National Development
NRM&L	Natural Resource Management and Livelihood Program
PLUP	Participatory Land Use Planning
SLR	Sea Level Rise
SMS	Short Message Service

Use of these Guidelines/ Working Training Manual

These Guidelines for Integrating Climate Change Considerations into Commune Development Planning are in the form of a Working Training Manual. The Manual is an output of the Coastal Adaptation and Resilience Planning Component (CARP) as initiated by the Cambodia Climate Change Alliance (CCCA). The objective of CARP is to increase 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.

This version of the Manual is in the form of a general template (available in both English and Khmer) specifically for use in Coastal Zone Communes, but also elsewhere in Cambodia. This document leaves spaces for the trainer(s) to collect and then add specific Commune/District data in advance to aid trainees in their analysis of their individual Communes and also for use in comparison between other selected Communes. This additional information which will be required (Charts, Maps, Text) is shown throughout this Manual in **Orange**

Each Chapter in the Manual consists of 4 Sections:

- **Outputs Expected** (What trainees will achieve from the training);
- **Data Availability** (What official data and other information is available to help trainees);
- **Information** (Additional technical assistance to help to produce the Outputs); and
- **Process** (Details of the work process that trainees have to undergo).

The **Process** and **Outputs Expected** for each Chapter are shown throughout in **Green**

A more tailored version of the Manual using specific Commune data was first presented at a Training Workshop held in Sihanoukville from 2nd – 3rd December 2013. This was attended by representatives from the Provincial Working Groups of both Koh Kong and Preah Sihanouk and all 8 selected Communes¹. The Training Workshop was held to provide a better understanding of the various elements of Climate Change involved in Commune Development Planning and how these can be analysed and incorporated into the planning processes by the individual Communes with the assistance of the Provincial Working Groups. Selected examples from that Training Workshop are included in this general template for illustration of the types of data/graphics used.

It should be noted that this Training Workshop was only part of a well established and continuing association with members of the individual Communes which has also included support for agriculture/livestock initiatives, as well as implementing small scale water supply related projects proposed by the Communes themselves. This has meant that several discussions about Climate Change and its implications had already taken place and that Commune representatives were familiar with identifying issues and potential adaptation solutions in their individual areas prior to the Training Workshop.

The Guidelines/Working Training Manual have been prepared by Mr. Ian Hamilton, International Spatial/Land Use Planner, in conjunction with Mr. Touch Vina, National Land Use/GIS Specialist and with the assistance of the International CTA, Mr. Jens Erik Lyngby.

¹ Peam Krasoab and Tuol Kokir (Mondol Seima District, Koh Kong Province); Ou Okhna Heng, Prey Nob, Sameakki, Tuek L'ak, Tuek Thla and Tuol Totueng (Prey Nob District, Sihanoukville Province).

1. Introduction

Existing Guidelines and Manuals

There are a number of recent guidelines and manuals related to development planning within Communes. These include:

- Sub-Decree on Commune/Sangkat Land Use Planning Procedure, (May 2009);
- Implementation Manual on Commune Land Use Planning (CLUP) (2009)²; and
- Guideline on C/S Development Plan (CDP) and C/S Investment Program (CIP), prepared by Inter-ministerial Working Group (July 2007)

It is therefore not intended that the contents of this CARP³ Manual should replace or conflict with those guidelines and procedures in any way.

The Purpose of this Manual

This Manual is solely designed to add Climate Change considerations into the planning process to complement existing data/analysis, so that decisions and investments can be made with an understanding of climate change projections and/or the expectation of extreme weather events.

These considerations are particularly intended to assist practitioners to assess:

- if there is evidence of climate change in the specific areas being studied, using existing data;
- whether any such climate change is significantly affecting the economic, social and/or environmental conditions in the areas being studied;
- whether the vulnerability of the area and/or its population to climate change is changing over time; and
- whether there are adaptation measures which can be incorporated into the planning process to increase the resilience of the area and/or its population to climate change.

These assessments would then form the basis for inputs into the respective CDP and accompanying CLUP processes from which any agreed Adaptation measures should flow. The CLUP process every 5 years (with a vision of 10 to 15 years and annual review) is timed to coincide with the CDP (also 5 yearly) and annual CIP preparation cycle.

It is not intended that additional data should be collected now as part of this assessment beyond that already assembled⁴, although investigations might be required at a later date to identify any appropriate Adaptation measures which may be required. Some basic training material⁵ has been produced by others which provides a useful background to Climate Change.

² Prepared by the Ministry of Land Management, Urban Planning and Construction (MLMUPC). Supported by Natural Resource Management and Livelihood Program (NRM&L), funded by Danida/DFID/NZAid. These are comprehensive guidelines for land use planning at the commune level (and are otherwise known as the "Green Book").

³ Coastal Adaptation and Resilience Planning (CARP) Component, Cambodia Climate Change Alliance

⁴ As part of a familiarisation programme all Communes should previously have contributed information on current issues affecting their areas together with proposed priority projects to address these issues.

⁵ Teacher Training Manual for Climate Change in the Coastal Zone by Save Cambodia's Wildlife, undated.

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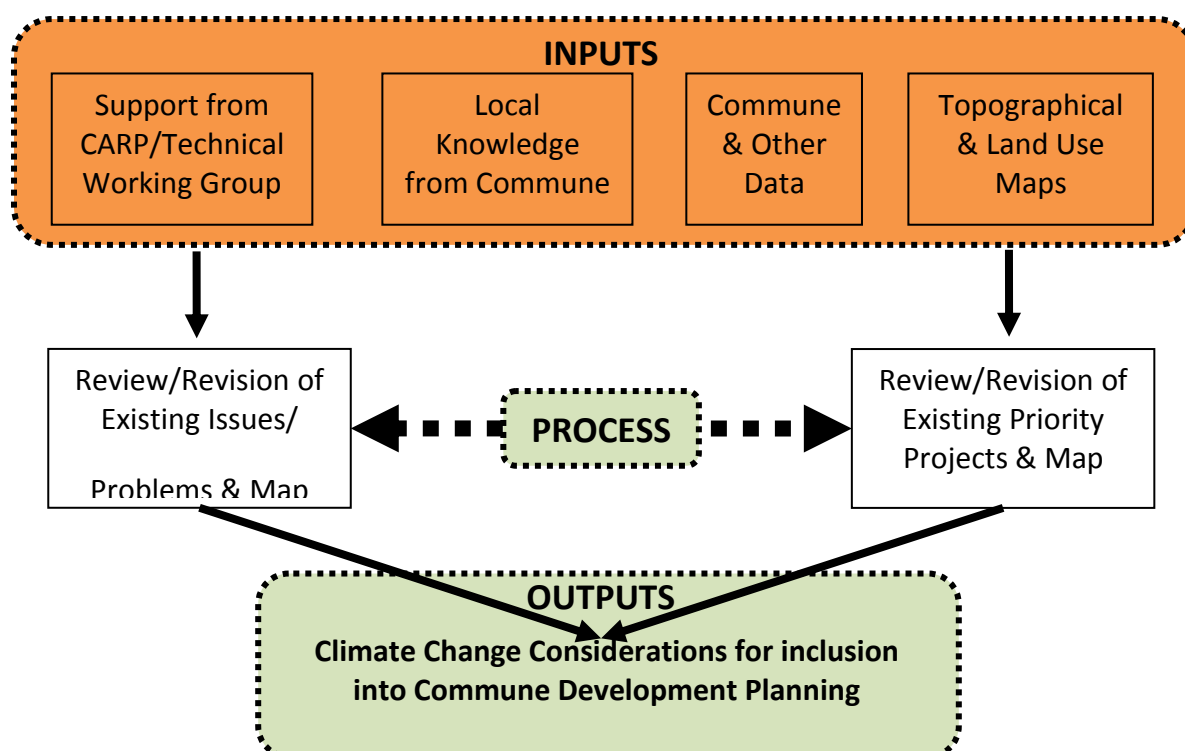
Identification of Climate Change Issues in Commune Planning Processes

There are a number of potential means whereby climate change related issues could be identified and addressed within the overall Commune Planning Processes. These means include:

- Provincial Hot Spot Map: based upon issues identified and mapped at Provincial level. This map is intended to identify areas which require special protection although their small scale (1: 100,000 or 1: 250,000) mean that only broad locations will be included. Any other available Hot Spot maps from District or Commune level should also be reviewed.
- Detailed Land Use Map: this map may identify changes in land use which could be climate change related as their scale (1: 10,000 to 1:30,000) is large enough to potentially delineate changes over time in crops, land forms and/or river courses.
- Problem Map: on which the Commune Planning and Budgeting Committee (PBC) and commune individuals can identify problems, causes and possible solutions.
- Data Books for Districts, Communes and Villages: identifying issues or by a comparison of data book information over time.
- Inputs from any village level Participatory Land Use Planning (PLUP), Commune Agro-Ecosystems Analysis (CAEA) or other formal processes.
- Comparative data from the Identification of Poor Households (IDPoor) Programme.
- Other Surveys and Investigations: not part of the 5 year CLUP process, initiated from either a top-down (e.g. review of time-series RS imagery) or bottom-up (disaster event reporting by officials and/or residents) process of problem identification. Includes local Hotspots.
- Experience and knowledge of residents who will have lived in the area for many years and who are intimately aware of subtle changes in the characteristics of their own Commune.

Communes will be encouraged to use all available sources of information in the preparation of the required Outputs in addition to those supplied by CARP (Topography and Land Uses).

Process for Using the Guidelines



Planning Context

Outputs Expected
<ul style="list-style-type: none">• A review of proposed National, Provincial and/or District plans/projects/policies which may impact upon the Commune
Data Availability
<ul style="list-style-type: none">• Provincial and District plans, detailing currently budgeted projects which will be implemented over the next 10 years.
Information
<p>Commune Development Planning should be undertaken with the knowledge that there will be plans, projects and policies developed at higher levels which, if implemented, may have a major impact on the functioning of the Commune. Such projects may include new infrastructure such as roads, dykes or water supply networks. Policies may also be promoted which provide incentives for people to live in the area, e.g. promoting new faster growing rice varieties.</p> <p>At the same time, proposals developed in each Commune can provide valuable inputs into higher level plans in terms of potential priority projects for short-term implementation and expected costs.</p>
Process
<p>Review any Plans/Policies and/or Projects which are provided to you from National, Provincial or District agencies, and in conjunction with Provincial/District staff, determine:</p> <ul style="list-style-type: none">• Which plans, projects and/or policies have the potential to have a major impact upon Development Planning in your Commune; and• Assess whether the Commune Development Planning should be revised to incorporate such higher level proposals.

Use of Statistics

Outputs Expected
<ul style="list-style-type: none"> • A review of selected parts of Commune Data Books for 2006 – 12⁶ to identify issues for consideration during the training process and for compiling future databases • A review of the comparative results of available Commune data from the IDPoor surveys.
Data Availability
<ul style="list-style-type: none"> • Commune Database for 52 individual items in 4 categories (Population, Economy, Household and Accessibility) for the years in question. The list of items is contained in Annex 1 to this Manual⁷. • Comparative indices for all Communes from Round 5 of the IDPoor surveys from 2004 – 12. Examples from the 8 original pilot Communes are contained in Annex 2 to this Manual.
Information
<p>District, Commune and Village Data Books</p> <p>These Data Books contain a number of questions, the responses to which could be used to make a Vulnerability Assessment of various current and changing Vulnerabilities⁸ to climate change, whether they be to structures, systems or to people. These Data Books are produced annually (in December) and contain a wealth of extremely detailed information about District, Commune and Village life. As such they can provide the basis of a bottom-up analysis of whether climate change is affecting such communities.</p> <p>There are several ways in which such data can generally be used:</p> <ul style="list-style-type: none"> • As a comparison of the Commune/Village with other Communes/Villages or averages for the whole District, Province or Country. This can be used for comparing growth rates and other performance related data (e.g. national standards for service provision) to assess if the area is different from other areas. This should lead to an investigation or discussions into any reasons for differences. It can be done for one point in time or preferably as a time series. • As a comparison of data over time within the same Commune/Village. A mass of detailed information now exists from 2006 which provides sufficient time to examine any trends or anomalies which may be apparent in the data sets. <p>Abridged versions of the Data Books can be found online on the National Committee for Sub-National Development (NCDD) web site http://ncdd.gov.kh/.</p> <p>However, there must be confidence that available statistics are accurate if they are to be used to analyse changes or as a comparison between areas and then used as an input to future planning. Much of each Commune's data should logically be a sum of the various villages in the Commune. Much District data will be a sum of data in all of its Communes. However, when data</p>

⁶ More recent data should be used once it becomes available.

⁷ These 52 items have been chosen as appropriate for Coastal Areas. Those studying other areas may wish to choose additional or alternative items which may better reflect conditions in those situations.

⁸ Vulnerability is defined as “the conditions determined by physical, social, economic, and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards”. Vulnerability Assessment is defined as “assessment as to the degree of loss to a given element at risk (or set of elements) resulting from a given hazard at a given severity level”.

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is collected there can often be interpretation of what is required, which can often lead to inaccuracies. This can mean that data from year to year and from place to place cannot easily be compared. A recent expansion of the number of items to be collected has also provided a challenge for those wishing to compare new categories with older ones.

This is therefore an exercise to look at the assembled data and ensure that it reflects reality as far as can be assessed. Any anomalies or inaccuracies can then be taken into account during the training and can also be used as an input for improving the data collection system in future years. The following data should be checked for each Commune as examples of figures which require further investigation. They have been identified because perhaps they do not follow an expected trend, they may be erratic or they may not correspond with other data which has been collected.

Commune A	Add data which requires further investigation
Commune B	Add data which requires further investigation
Commune C	Add data which requires further investigation
Commune D	Add data which requires further investigation

IDPoor Programme⁹

The household questionnaire of the IDPoor survey collects information regarding various socioeconomic characteristics of poverty which are easily observable and verifiable, including household construction materials, main income activity, asset ownership and dependency ratio. Responses to these questions are weighted and summed to produce an IDPoor Score for every interviewed household, whereby the highest IDPoor Scores are associated with the poorest households. The weights given to each question were determined in close consultation with communities throughout Cambodia; as such, the contribution of a socioeconomic characteristic to a household's IDPoor Score conveys the relative importance of the characteristic in understanding poverty as defined by the communities themselves.

The IDPoor survey provides an opportunity to assess each Commune's relative vulnerability to risk throughout the country and an indication of how that vulnerability has changed over time.

Process

Review the statistics provided for your Commune for 2006 – 12 and determine:

- If there are individual numbers which need to be reviewed and reconsidered; and
- Whether the statistics generally describe the situation in your Commune for the given years.

⁹ The Identification of Poor Households (IDPoor) Programme was established in 2006 within the Ministry of Planning to officially establish national procedures for identification of poor households and to realise their implementation throughout Cambodia

Population

Outputs Expected	
<ul style="list-style-type: none"> An understanding of population dynamics in the commune from 2006 – 12 in terms of growth rates, household formation, migration, gender and vulnerable persons 	
Data Availability	
<ul style="list-style-type: none"> Commune Database Online categories as follows (2006 – 12): 	
<ul style="list-style-type: none"> Population Families Female Headed Families Population at working age (18 - 60) Vulnerable Elderly No Guardian Victims of Natural Disasters Vulnerable Disabled 	<ul style="list-style-type: none"> Migration: Permanent In Migration: Permanent Out Migrants going out for work Of which Female Migration: Temporary In
Information	
<p>“Population” is being examined to assess the relative growth in numbers of people over time which can be used a proxy indicator of the overall attractiveness of the area to residents and potential migrants. The following graphic (Error! Reference source not found.) depicts the population growth rates (Average Annual Growth Rates or AAGR) of the Communes from 2006 – 12.</p> <p>This is compared to the AAGR of the rural parts of the Province(s) between the two Census periods of 1998 – 2008. This is not intended as an exact comparison: it uses data which is easily available and which can be used to alert practitioners to potential issues which can be studied in more detail using other data.</p>	
<p>Figure 1: Population Growth of Communes and Rural Provinces</p> <p>And comment on relative growth rates (between Communes and with the Province as a whole) and suggest reasons for the relative attractiveness of areas to assist trainees in their analysis.</p>	
<p>A variety of rates will suggest that each Commune may have different characteristics which could be influential in attracting or even deterring settlement in the area. It will obviously be important to understand the reasons for this variety. Other more detailed data may be able to assist in this task.</p> <p>The rates of population growth may also be important when considering the potential future vulnerability of the people to climate change risks. An increasing and vulnerable population can be more susceptible to the impacts of climate change if they locate in potentially disaster prone areas or live in hazardous conditions.</p>	
Gender and Vulnerable Persons	
<p>The number or proportion of female headed families is often taken as an indicator of vulnerability especially when a disaster hits an area. The following graphic (Figure 2) indicates rates for the Communes from 2006 – 12. Women with a reduced support network and often with young children, will have special needs at such times but may have limited resources to deal with disasters if a large number of able-bodied male relatives/friends are absent from the household.</p>	

The number of disabled and elderly persons may also be examined to assess the potential mobility of residents and the speed at which they could react to adverse events.

Figure 2: Female Headed Families

And comment on changes in rates between Communes and suggest possible reasons for differences (if any) to assist trainees in their analysis.

There may be a relationship with migration numbers in terms of the male/female mix of those seeking work outside the Communes as shown (Error! Reference source not found.). Clearly, if more males are going out to search for work with the women staying behind to look after the family, then all things being equal, this suggests an increased vulnerability to natural disasters such as extreme weather events.

Figure 3: Working Outside the Area

And comment on changes in the number of persons (male/female) going out to seek work in these communes to assist trainees in their analysis.

Process

Review the available data for your Commune and answer these questions:

Population

- Has your Commune's population (2006 – 12) grown slower or faster than the Provincial average?
- What do you think is the reason for this difference in growth rates?
- Is there any way to reverse the outward migration of people, especially women?

Climate Change

- Do you think any of these reasons for faster/slower population growth relates to climate change or extreme weather events? If so, what reasons.
- Which events caused the "Victims of natural disasters" given in the statistics?

Economy

Outputs Expected	
<ul style="list-style-type: none"> An understanding of the economic structure of the commune and how/why this may have changed from 2006 – 12. 	
Data Availability	
<ul style="list-style-type: none"> Commune Database Online categories as follows (2006 – 12): 	
<ul style="list-style-type: none"> Main Occupations: Rice Main Occupations: Fish Main Occupations: Non-Agriculture Wet Rice Yields Rice Area Rice Area Rice Area irrigated in dry season Access to Irrigation System Own Rice Land < 1 ha. Own No Rice Land Rice Mills (small, medium & large) 	<ul style="list-style-type: none"> Total Motor Boats Raising Fish Of which in Pond (others in cage) Fish Ponds Raising Shrimp/Prawn Shrimp/Prawn Ponds Shrimp/Prawn Ponds
Information	
<p>Worldwide the proportion of urban dwellers has increased over time and now exceeds 50%. The same can be said for occupations, with a smaller proportion needed in and wanting to be involved in rural activities. The type of livelihood undertaken will vary according to many factors, including climate change. The following chart (Error! Reference source not found.) depicts employment patterns for the main occupations for families in selected Communes. A practitioner might want to investigate why there are any differences in the proportion of families involved in a variety of rural pursuits.</p>	
<p>Figure 4: Changes in families’ main occupations in Communes A, B, C</p> <p>And comment on any changes in types of employment between Communes and suggest possible reasons for differences to assist trainees in their analysis.</p> <p>For Coastal Areas the main categories may be rice, fish/shrimp and services. For Inland Areas the mix of employment may be more varied and depend on geographical location and topographical features.</p>	
Process	
<p>Review the available data for your Commune and answer these questions:</p>	
Population	
<ul style="list-style-type: none"> Has your Commune’s employment (2006 – 12) in each of the following: rice (or other agriculture), fish and non-agricultural jobs, increased or decreased? Why do you think these increases/declines have occurred? Is there potential to increase the areas (hectares/m²) or season (weeks/months) allocated to either rice (or other agriculture) or other uses? Do you expect a change in the proportion of people employed in rice (or other agriculture), other uses and services in future? If so, why? 	

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Climate Change

- Do you think any of these reasons for previous changes in types of employment relates to climate change or extreme weather events? If so, what reasons.
- Do you expect climate change and/or extreme weather events to influence employment in future?

Housing & Utilities

Outputs Expected	
<ul style="list-style-type: none"> An understanding of changes in the quality of housing and access to utilities and how/why this may have changed from 2006 – 12. 	
Data Availability	
<ul style="list-style-type: none"> Commune Database Online categories as follows (2006 – 12): 	
<ul style="list-style-type: none"> Housing: Total Housing: Thatched Roof Housing: with electricity Living on Public Land 	<ul style="list-style-type: none"> Battery Charging Potable Wells (Pump, mixed, ring) <ul style="list-style-type: none"> Of which unusable dry season Wells (pump, mix, ring) need repair Unprotected dug wells <ul style="list-style-type: none"> Of which unusable dry season Source >150 m from home Dry season safe water (pump, mix, well) Dry season unsafe (ring, dug, pond, river)
Information	
<p>Housing Quality</p> <p>The following chart (Error! Reference source not found.) shows details of the number of houses with thatched roofs in all of the communes in one District. Commune leaders could compare data between areas and use as a proxy for development progress and income levels in their commune or as potential vulnerability to a disaster such as a windstorm/cyclone.</p>	
<p>Figure 5: Houses with Thatched Roofs in District A (% of total)</p> <p>Comment on whether there has been a reduction in vulnerability in recent years by changing to zinc/fibro or other more permanent roofs to assist trainees in their analysis.</p>	
<p>Electricity</p> <p>Similarly, data on electricity connectivity over time can be used as a proxy for development progress (Error! Reference source not found.).</p>	
<p>Figure 6: Houses with Electricity in Communes A, B, C</p> <p>Comment on whether there has been a reduction in vulnerability in recent years due to an increase in the percentage of houses with electricity to assist trainees in their analysis.</p>	
<p>Access to Potable Water</p> <p>Dry season water accessibility is split into Safe (pump, mixed well) or Unsafe (ring, dug, pond, river). Availability of dry season water in terms of both quantity and quantity is a key indicator of vulnerability (Figure 7). The need to either travel far and/or pay high rates for potable water in the dry season can seriously impact on a household’s ability to undertake its normal livelihood activities. Reduced vulnerability should be reflected in an increase in safe water supplies during the dry season.</p> <p>Potable water provision in future will increasingly be through a centralised supply rather than individual wells as this can be made more secure in terms of pollution and seasonality. There is</p>	

data on current potable water supplies in terms of wells and how many of these are unusable in the dry season. However, this data is extremely erratic and seems to have been discontinued from 2011 onwards.

Figure 7: Dry Season: Access to Safe Potable Water, District A

Comment on whether there has been a reduction in vulnerability in recent years in terms of changes in access to safe water supplies in the dry season to assist trainees in their analysis.

Solid Waste Disposal

Although often not considered to be of high priority, the uncontrolled disposal of solid waste has the potential to cause health issues through increased breeding of disease vectors, contamination of water supplies and blockage of water channels. This can become a major issue when solid waste is dumped in areas subject to flooding and Sea Level Rise (SLR).

Process

Review the available data for your Commune and answer these questions:

Housing

- Compare changes in population and housing in your Commune (2006 – 12). Have they changed at similar rates or is there now a housing shortage or surplus?
- Has the quality of housing generally improved since 2006?

Utilities

- Is the electricity supply mostly reliable or do people still need to rely on batteries/generators when there are power cuts?
- Are there any major communal or shared water supply sources, especially for the dry season? Please locate them on the map and describe what sort of facility (e.g. piped, well, tank, lake).
- Which areas tend to have problems with water supply (quality, amounts), especially during the dry season? Please locate them on the map.
- Is there any potential to create a centralised water supply system which can collect water and serve the whole Commune?
- Is there a solid waste disposal site in the Commune? If no, where do people dispose of their waste? If yes, is it a controlled site?

Climate Change

- When housing is improved or newly built do the owners/builders include any provision for climate change in the designs? If yes, list any such as:
 - raising building on stilts or raising foundations,
 - including gutters and rainwater harvesting
- Do any buildings utilise renewable forms of energy?, e.g. solar/photovoltaic panels or wind.
- Are public buildings designed to take account of any unstable/weak soils in low lying areas (e.g. through piling or minimising weight of structures)?
- Have Dry Season safe water supplies been increasing or decreasing (number, quality) in recent years? If supplies have been decreasing is it due to climate change or to an increase in the population and demand for water?

Accessibility

Outputs Expected	
<ul style="list-style-type: none"> An understanding of how accessibility within and from the Commune has changed from 2006 – 12. 	
Data Availability	
<ul style="list-style-type: none"> Commune Database Online categories as follows (2006 – 12): 	
<ul style="list-style-type: none"> Roads Non-Earth Roads Earth Bridges Bridges Drainage Culverts 	<ul style="list-style-type: none"> Road Access Distance to nearest primary school Distance to Market Distance to Health Centre
Information	
<p>Improved accessibility is an important factor in marketing as well as in evacuation and post-disaster response. It can be shown through changes in both the length and quality of roads within a Commune. So it is important to note both (Error! Reference source not found.) as well as the date when earth roads get upgraded. Such information can also be supported by increases in numbers/metres of bridges and culverts.</p>	
<p>Figure 8: Commune A, B, C Road Development</p> <p>Comment on whether there has been an increase in accessibility (both earth and non-earth roads) over the period to assist trainees in their analysis. Compare different rates of road building programs between Communes if relevant.</p>	
<p>Improved accessibility should also reflect the general development of the Commune and thus reduced distances to key facilities such as markets, health centres and schools. There may be a wide range between Communes in accessibility to such facilities.</p>	
<p>Improvements in accessibility are made through “projects” which also show that the government and the people living in the Commune are committed to the future of the area. Areas with less potential and support tend to have less projects which in turn leads to out-migration. Similarly, Villages/Communes which are close to existing District/Provincial centres and main roads tend to receive more projects and support than settlements which are more remote.</p>	
<p>In terms of Climate Change, there is a tendency for engineers to automatically refer to expected SLR and then specify a higher Elevation Code (EC) for roads/buildings to address this issue. However, raising the level of roads and/or buildings can often have adverse affects elsewhere unless fully considered at the planning and implementation stages. The raising of road heights needs to be considered in conjunction with transverse drainage to ensure that any flood waters can be drained from the area after heavy rain and not remain to cause prolonged and worse flooding. Raising of road heights should also consider intersections with other roads which may not be raised, access for those living (often below the new EC) alongside the road and also for bridges along routes which may be expensive to raise.</p>	
<p>The raising of buildings by filling can also lead to “ponding” of water and flooding of low-lying plots in the vicinity, so the area’s drainage needs to be carefully considered prior to such works. Ponding can also lead to health risks from stagnant water and/or increase in mosquito breeding</p>	

Guidelines for Integrating Climate Change Considerations into Commune Development Planning

sites.
Process
Review the available data for your Commune and undertake the following:
Accessibility
<ul style="list-style-type: none">• Draw the main access route from each Village in the Commune towards the nearest main (National/Provincial/District) road either within or outside the Commune.• Locate the position of any Primary School, Health Centre or Market within the Commune on the map (or the nearest ones if outside your Commune).• If you want to sell/buy goods do you go to this Market or elsewhere? If elsewhere, where and how far away (Km/Minutes)?• Indicate on the map any new/improved routes (earth or non-earth) which would improve peoples' accessibility• For those with water access, locate any existing jetties. Indicate on the map any new/improved jetties/moorings which would improve peoples' accessibility. <p>Based on the above:</p> <ul style="list-style-type: none">• Has accessibility within the Commune increased since 2006?• Can accessibility be improved more? If yes, how?
Climate Change
<ul style="list-style-type: none">• Locate the positions of any roads which regularly flood• Locate the positions of any roads/bridges/culverts which are subject to erosion• Locate the position of any dykes and highlight any areas (including water control devices) requiring improvement• If the Commune was to experience a SLR of 100 cm (refer to topographical map) which routes would be affected? Would the whole Commune still be able to gain access to a main (National/Provincial/District) road• Do all your road/bridge/culvert project proposals include an allowance for possible Climate Change or extreme weather events in terms of:<ul style="list-style-type: none">○ SLR (increased height of structure),○ Salinity (reduced exposure or increased protection for metal)○ Heat (materials, especially road surfaces)○ Allowance for unstable and weak soils in low lying areas (e.g. piling)• If road proposals are for higher elevations, do they consider the impact of the raised road on drainage patterns, especially the potential for inadvertently retaining flood waters after heavy rains?• If there have been any proposals for structures such as dykes or jetties, have they included an allowance for Climate Change? (e.g. SLR, storm surges, wave action, cyclone winds)• If there have been any proposals for structures such as dykes or jetties, have they included an allowance for unstable and weak soils in low lying areas? (e.g. piling)

Identified Issues

Outputs Expected

- A review of issues which were previously identified and mapped by the Commune and which affect living and working conditions in the area

Data Availability

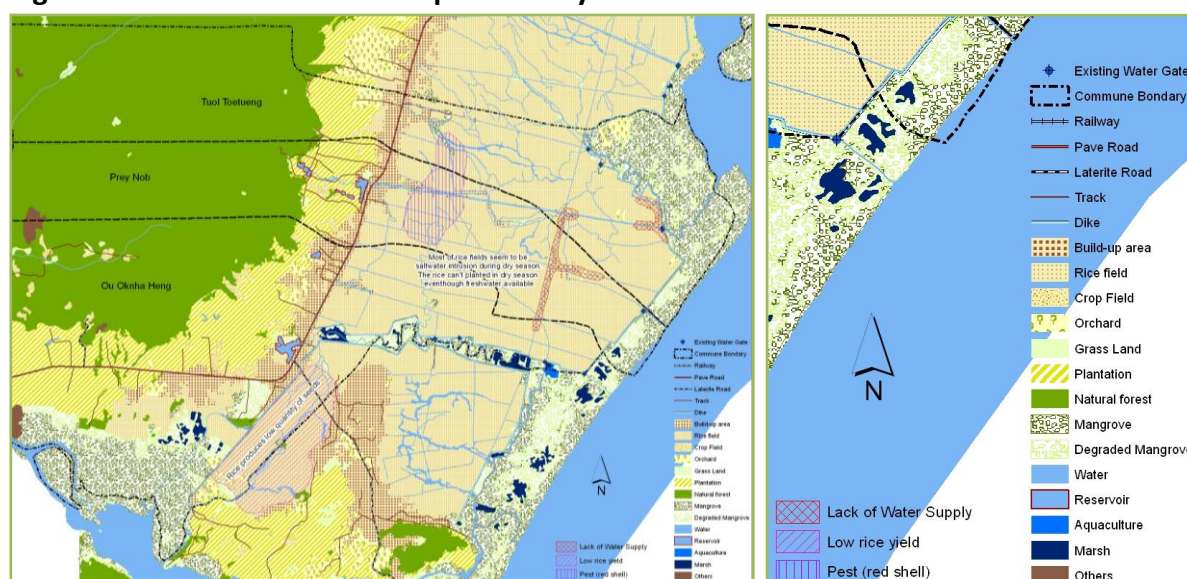
- Maps provided on which each Commune has added its identified issues

Information

Commune representatives will have previously identified and mapped the locations of major issues in their area which affect living and working conditions. These issues include extreme weather events such as storms and floods, as well as other potential climate change related issues including low rice yields, impact of pests and restricted water supply.

The example given below (Error! Reference source not found.) is from the southern part of Prey Nob District. Highlighted problems on the land use base focus on areas where representatives from the pilot Communes have identified a lack of water supply, low rice yields and occurrence of pests.

Figure 9: Identified Problems in part of Prey Nob District



Process

Review the maps that were previously prepared for your Commune and:

- Consider whether you wish to make any changes to the information already provided
- Add any additional issues that you may have identified as a result of this training session today.

NOTE: Any identified projects to address these issues should NOT be added at this stage

Land Use Planning & Climate Change Adaptation

<p>Outputs Expected</p> <ul style="list-style-type: none"> An understanding of how Climate Change may result in a need for the Commune to adapt to changing circumstances.
<p>Data Availability</p> <ul style="list-style-type: none"> Maps provided on which topography has been marked.
<p>Information</p> <p>Assumed Climate Change in Cambodia</p> <p>The ADB recently reported¹⁰ that “Cambodia’s high vulnerability to climate change is attributed to its low adaptive capacity and high reliance on climate-sensitive sectors such as water resources and agriculture. The 2011 floods alone, for example, caused an estimated \$451 million in damage and \$174 million in losses. Analysis of 14 general circulation models suggests that the onset of rainfall will commence later, wet season rainfall will increase (bringing more flooding) and dry season rainfall will decrease (leading to droughts). Finally, Cambodia’s 435-kilometre coastline and large parts of the Mekong River flood plain may be affected by SLR, which is projected to make additional areas vulnerable to floods, salinity intrusion, and coastal inundation, with adverse implications for food and water security and infrastructure stability. Climate change thus poses a serious threat to sustainable development in Cambodia”.</p> <p>The CARP project¹¹ has assumed the following:</p> <ul style="list-style-type: none"> A SLR of 18 to 56 cm by the 2090s. An increase in rainfall along the coast by 2 to 6% by 2050. And a consequential increase in frequency and intensity of flooding events due to more frequent episodes of heavy rainfall. An increase in mean annual temperatures by 0.3 to 0.6 °C by 2025, by 0.7 to 2.7 °C by the 2060’s and by 1.4 to 4.3 °C by the 2090’s. This increases the risk of periodic droughts as well as a substantial increase in the number of ‘hot’ days and nights. <p><i>Sea Level Rise</i> combined with a decline in mangroves, and an increase in the frequency and intensity of storms and storm surges, has already led to some coastal inundation. A consequence is the salinization of the land surface as well as the groundwater, impacting the fertility of farming areas as well as freshwater ecosystems. This poses a threat to food security and livelihoods because most agriculture in the coastal zone is concentrated on these flood-prone low-lying coastal areas. Infrastructure in the coastal zone also comes under pressure, leading to increased vulnerability over time and lost/interrupted income due to reduced accessibility.</p> <p><i>Increasing rainfall</i> particularly at the coast. Storms occur almost every year from mid October and through December. However, with climate change causing more variable weather, there may be an increase in both the intensity and frequency of flooding events. Flooding, heavy rainfall and storms destroy property and productive assets, such as crops and livestock. Flooding will often lead to polluted water supply and unsanitary/unhygienic conditions, causing serious health issues</p>

¹⁰ Kingdom of Cambodia: Mainstreaming Climate Resilience into Development Planning, Project Number: 45283. Capacity Development Technical Assistance (CDTA). September 2012.

¹¹ Assessment of Community Vulnerability and Risks from Climate Change in the Coastal Zone of Cambodia. October 2012.

and outbreaks of disease. An increased frequency of storms will also affect cultivation, fisheries and coastal erosion.

Temperature rises increase the likelihood of droughts and hot days/hot nights. Droughts or heat waves will ultimately cause water scarcity. All such issues have a detrimental effect on the overall health of people, crops and livestock. An increase in temperature or occurrences of heat waves will also reduce the ability of people to work due to heat stress. Though only a minor concern in coastal areas today, this scenario may escalate if the weather becomes more irregular, in which case the coastal area will be particularly vulnerable.

Coastal Communities and Climate Change

Without assistance those living in coastal areas will struggle to adapt to climate change through lack of capacity to act, as stated in a recent policy brief¹². However, many of these issues also relate to inland areas in Cambodia:

- Lack of capacity to secure fisheries and agriculture activities in coastal villages to bring continuity to food security
- Lack of capacity amongst coastal villagers to meet water resource needs economically during flood and drought cycles outside of rice production needs
- Lack of capacity amongst coastal villagers to lower the impact of drought on home based food production systems to ensure food security throughout the year
- Lack of capacity amongst coastal villagers to access development services appropriately, e.g. micro-finance institutions, livelihood technologies, and natural resource management capacity development
- Lack of capacity amongst coastal villagers to engage in local level participation in natural resource management initiatives to sustain a diverse set of rural livelihood strategies and family nutritional needs

All of these issues have relevance for land use planning in terms of community involvement in decision making with regard to CDPs and CLUPs and also in the design and implementation of supporting infrastructure and other facilities.

Land Use Planning and Climate Change

Land Use Planning relates mainly to the zoning of land for defined purposes and to the locating of infrastructure/services in a way which best serves the current and future expected needs of the immediate community and the wider public good (e.g. delineation of national parks). Together with building control it can be used to create a regulatory framework within which areas are intended to develop.

As a matter of course land use planners consider current land suitability and availability as key considerations as part of a plan generation process. Climate change is relevant to both as land may become both unsuitable and/or unavailable in future depending on actual changes in climate such as SLR. Planners must therefore consider that such factors are not fixed and may change over time.

Appreciation of the potential magnitude of climate change impacts has meant that land use planners now have to consider future scenarios of where future development should be located as

¹² Climate Change Adaptation Knowledge Platform. Policy Brief: Climate Change Resilience in Coastal Cambodia – Adaptive Capacity and Human Development. 2011.

Guidelines for Integrating Climate Change Considerations into Commune Development Planning

well as considering how to deal with climate change threats potentially affecting currently developed areas. It is clearly not sensible to plan future areas in a form or location so that they will be affected by projected climate change in the short and medium terms.

The future (not mutually exclusive) options for both governments and individuals with regard to planning are to:

- Continue current activities with climate change adaptation options being limited to local funding of incremental improvements in current systems of water supply, coastal protection and accessibility with experiments in alternative livelihoods (SHORT-TERM, LOCAL & INCREMENTAL);
- Accept that external (technical/financial) assistance is required through possible changes in livelihoods to adapt to changing circumstances (e.g. mixed rice/shrimp production); more robust infrastructure including water supplies and coastal protection: and individual house improvements to better adapt to climate change (MEDIUM-TERM, EXTERNAL & EVOLUTIONARY);
- Relocate some properties and infrastructure to locations which can be better protected from increasing climate change impacts but make use of opportunities created through a retreating coastline or maintenance of coastal protection devices (LONG-TERM, STRATEGIC & RELOCATIONAL).

However, for individuals or families these options should not necessarily be seen as logically following each other. One person's short-term adaptation approach may be similar to another's long-term solution. Many people have already moved away from coasts to what they perceive to be safer locations while others are more prepared or resigned to remain and adapt over time to changing circumstances.

But governments and especially planners must weigh up the relative costs and benefits of remaining and protecting as opposed to relocating and rebuilding. For example, the financial or economic arguments in deciding whether to build a 5 km seawall to directly protect 200 families from SLR are complex. All providers of public services whether they be roads, power poles or buildings, must take into account some assessment of expected SLR during the projected life of the structure.

As decision making becomes more long-term and strategic it needs to consider expected impacts of climate change and make choices between adaptation in situ or relocating to more suitable locations. These decisions will involve the allocation of huge amounts of investment in infrastructure and services by the government and directly impact on the private sector and individuals in their choices of where to live, work and play.

Interconnectivity between rural and urban areas

The coastal area consists of a mixture of land uses, from large urban areas to small hamlets and from mangrove fringed paddy fields to elevated natural forests. However, they are intimately connected. The urban areas serve as the means to market rural produce and in turn provide centralised services utilised by those living in rural areas. On one hand, there is a need to relate what is planned and implemented at the urban level with the rural activities that support urban functions. At the same time, if rural activities are affected by sea-level rise or increased salinity, this will feed into production, incomes, employment and investment and directly influence the well-being of the urban area.

Unlike urban areas, the majority of the population in the rural coastal project areas relies heavily

and directly on agriculture and therefore on expected seasonal climatic fluctuations, particularly in rainfall. Lack of fresh water or uncertain/erratic supplies has historically always had severe implications both for livelihoods and the direct ability of the population to survive. The resilience of such population is being further tested by SLR together with associated increases in seasonal salinity in water courses and water supplies. This is increasingly an issue during the dry season and means that drinking water has to be purchased from elsewhere and alternative livelihoods to growing rice need to be sought. In addition, the potential impacts from extreme weather events may be more devastating than gradual climate change events such as any currently expected rise in sea levels. Disaster Risk Management (DRM) initiatives may therefore become a higher priority in future if the frequency/magnitude/duration of such events increase¹³.

This situation has contributed to a significant shift to urban areas in the search for more lucrative, secure and less physically demanding work. Over the last 10 years the urban population of Cambodia has grown at a rate of between 3.9 and 4.5% AAGR. (2003 – 2010). The rural parts of other provinces have grown at slower rates over the period 1998 – 2008. Incomes have risen more slowly in rural areas and a significant part of rural incomes now comes from non-agricultural sources such as service employment (including tourism) and remittances from family members living elsewhere. It is increasingly the case that rural populations are unable to survive purely from traditional agricultural and other rural activities.

Adaptation

In urban areas, potential adaptation measures are mostly related to the preservation of the built environment and involve large numbers of people with similar circumstances. However, in coastal rural areas the impacts of climate change can be reflected in changes of land cover (e.g. through erosion, increased salinity), livelihoods undertaken (e.g. moving from rice to shrimp farming) as well as the viability of infrastructure and services (e.g. contaminated wells or pressure on dykes).

In urban areas the sheer weight of population numbers and investments means that adaptation rather than relocation is usually the preferred option. In coastal rural areas it can be expensive to plan for climate resilience, given the small numbers of people involved and if they still cannot be persuaded to remain following any adaptation investments.

However, climate change is only one of several factors influencing land use planning decision-making. Other factors such as the government's socio-economic policies and investment plans are likely to be more significant. In rural areas, land tenure is probably the most important factor in development decisions. So although these guidelines are intended to incorporate climate change into land use planning, it should not be assumed that climate change considerations per se will be the main factor determining decisions.

Process

Some Climate Change models have projected SLRs of up to 1 metre (100 cm) by the end of this century. Using the topographical information provided you are requested to try to imagine a situation where average SLR was 150 cm. As planners and if such a situation occurred, you are asked to decide how the Commune could still function. Review the available data for your Commune and undertake the following:

¹³ The issue of frequency of events requires more study: whether such a weather event would occur more often (perhaps a 1 in 10 year event) instead of every 50 years. Such information would have a major influence on government investment decisions and construction standards in affected areas (protect, adapt or relocate) and also on those of businesses and residents.

Guidelines for Integrating Climate Change Considerations into Commune Development Planning

Climate Change

- Locate all land remaining above the 150 cm contour.
- Decide which populations may have to adapt or be resettled.
- What would be required for populations to adapt and not be resettled?
- Identify which land may be suitable and available for resettlement.
- Identify which schools, clinics, markets may need to be relocated.
- Suggest viable livelihoods for those living in the Commune in such circumstances

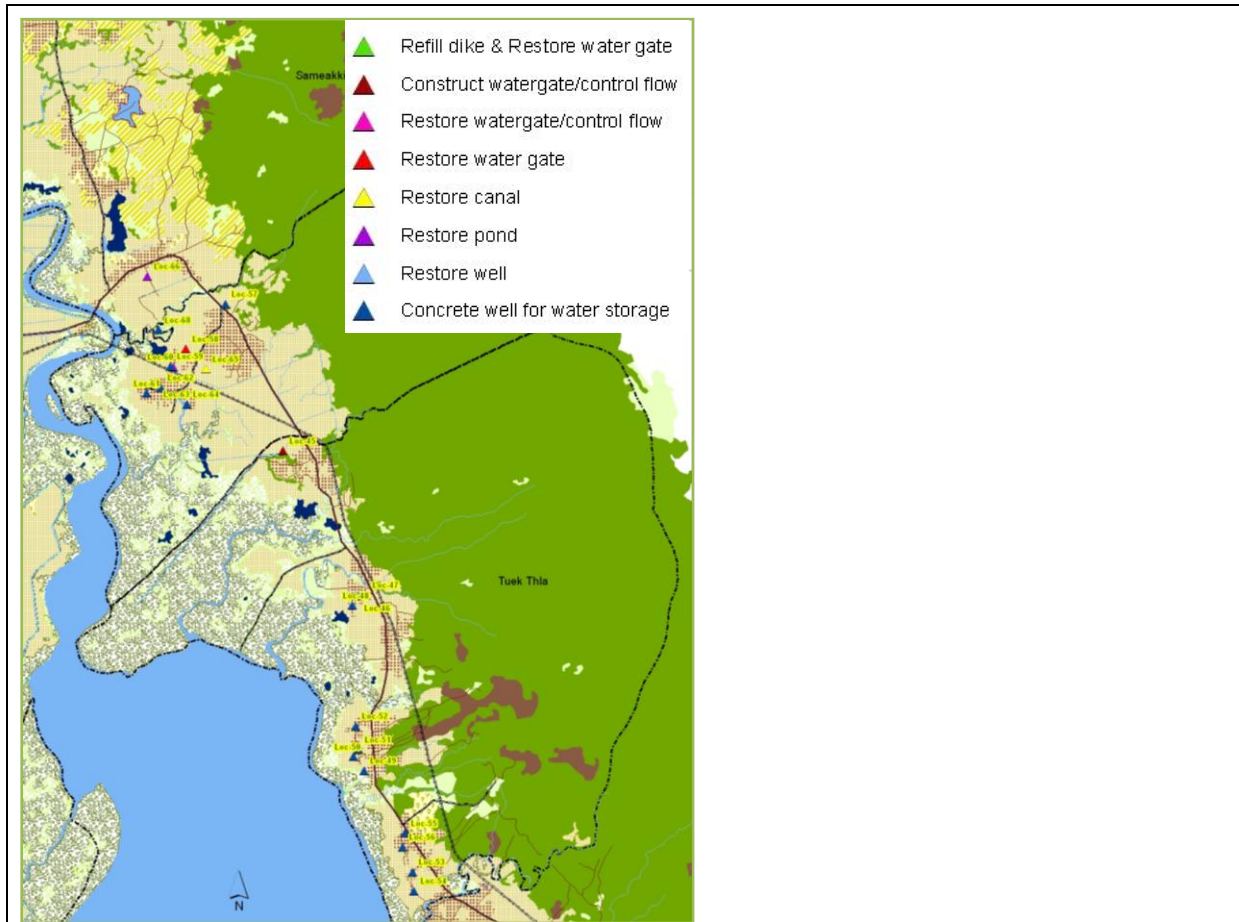
Disaster Risk Management (DRM)

Outputs Expected
<ul style="list-style-type: none">• A review of the Commune's preparedness for extreme weather events
Data Availability
<ul style="list-style-type: none">• Feedback from Commune representatives on current plans and procedures
Information
Extreme weather events include storms, floods, cyclones and/or fires which can occur on a seasonal or occasional basis. Compared to more gradual climate change, extreme weather events are usually short-lived, but with the potential for immense focused damage as well as longer-term impacts. This is especially so for those living in often flimsy buildings in low-lying coastal areas which are more susceptible to both water and wind based events.
Process
Review the procedures that are in place for the Commune to be warned and to pass on warnings of expected extreme weather events. Specifically: <ul style="list-style-type: none">• What are the procedures for the Commune to receive warnings about expected extreme weather events (e.g. siren, mobile phone, SMS)?• How does the Commune leadership pass on any warnings to the people?• What actions do any early warning plans/training propose in the event of any impending event (e.g. escape route, nominated safe buildings, rendezvous points, responsibilities for evacuation)?• Could the current system be improved, and if so, how?• Do any infrastructure/facilities need to be improved specifically for addressing potential extreme weather events?

Inputs to Commune Development Planning

Outputs Expected
<ul style="list-style-type: none">• A map and description of future projects which are considered by the Commune to be relevant in addressing Climate Change and extreme weather event concerns in the area.
Data Availability
<ul style="list-style-type: none">• Maps previously provided on which each Commune will have added its identified issues, together with any additional work prepared during the training session.
Information
<p>You have now worked with statistics, maps and Provincial/local knowledge to understand how your Commune functions as part of the District/Province and also what challenges exist in future for the continued successful functioning of your Commune. In this final chapter of the guidelines you are asked to review your current Commune Development Planning and supporting projects in light of all that has been discussed.</p> <p>Commune representatives have previously identified and mapped the locations of proposed priority projects which they believe will address climate change impacts. The example given below (Error! Reference source not found.) is from Mondol Seima where the pilot Communes have identified a number of water related projects which mostly relate to extending the provision of potable water longer into the dry season.</p>
Figure 10: Proposed Priority Projects in Mondol Seima Pilot Communes

Guidelines for Integrating Climate Change Considerations into Commune Development Planning



Process

On the basis of discussions during the training session as well as previously mapped knowledge you are requested to:

Policies, Plans and Projects and Climate Change

- Refer to any proposed National/Provincial/District projects which may have relevance for the Commune.
- Review previously proposed projects that the Commune considered priorities in addressing Climate Change and extreme weather event concerns in the area.
- Revise/add to priority projects based upon knowledge gained as part of the training process.
- Provide broad costs (e.g. < \$10,000, or above that to the nearest \$10,000) and proposed phasing of proposed projects
- Propose any other actions, (e.g. DRM, Studies) relating to Climate Change or extreme weather which would be of benefit to the Commune

Annex 1: Commune Data Book Extracts

These 52 items have been chosen as being most appropriate for studying climate change considerations in Communes located in Coastal Areas. Those studying other areas may wish to chose additional or alternative items which may better reflect different conditions and/or situations.

Category	No.	Data	Reason for examining
Population Details	1.	Population	Relative Growth: Attractiveness of area
	2.	Families	Relative Family Size: Attractiveness of area
	3.	Female Headed Families	Vulnerability Indicator
	4.	Working age population	Employment: Attractiveness of Area
	5.	Migration: Permanent In	Employment: Attractiveness of Area
	6.	Migration: Permanent Out	Employment: Attractiveness of Area
	7.	Migrants going out for work	Employment: Attractiveness of Area
	8.	Of which Female	Employment: Attractiveness of Area
	9.	Migration: Temporary In	Employment: Attractiveness of Area
	10.	Vulnerable Elderly	Vulnerability Indicator
	11.	Victims of Natural Disasters	Historical Disasters
	12.	Vulnerable Disabled	Vulnerability Indicator
Employment/ Land Status	13.	Main Occupations: Rice	Changes in activities over time
	14.	Main Occupations: Fish	Changes in activities over time
	15.	Work: Non-Agriculture	Changes in activities over time
	16.	Wet Rice Yields	Employment/Income: Attractiveness of Rice
	17.	Rice Area	Employment/Income: Attractiveness of Rice
	18.	Rice Area	Employment/Income: Attractiveness of Rice
	19.	Area irrigated dry season	Employment/Income: Attractiveness of Rice
	20.	Access to Irrigation System	Employment/Income: Attractiveness of Rice
	21.	Own Rice Land < 1 ha.	Changes in Land Tenure
	22.	Own No Rice Land	Changes in Land Tenure
	23.	Living on Public Land	Changes in Land Tenure
	24.	Rice Mills	Employment/Income: Attractiveness of Rice
	25.	Motor Boats	Attractiveness of water based activities
	26.	Raising Fish	Income: Attractiveness of Fish/Prawn
	27.	Of which in Pond	Income: Attractiveness of Fish/Prawn
	28.	Fish Ponds	Income: Attractiveness of Fish/Prawn
	29.	Raising Shrimp/Prawn	Income: Attractiveness of Fish/Prawn
	30.	Shrimp/Prawn Ponds	Income: Attractiveness of Fish/Prawn
	31.	Shrimp/Prawn Ponds	Income: Attractiveness of Fish/Prawn
Living Conditions	32.	Housing: Total	Changes in Housing Quality
	33.	Housing: Thatched Roof	Changes in Housing Quality
	34.	Housing: with electricity	Changes in Housing Quality
	35.	Battery Charging	Changes in Housing Quality
	36.	Potable Wells:	Changes in water supply conditions
	37.unusable dry season	Changes in water supply conditions
	38.	Wells need repair	Changes in water supply conditions
	39.	Unprotected dug wells:	Changes in water supply conditions
	40.unusable dry season	Changes in water supply conditions

Guidelines for Integrating Climate Change Considerations into Commune Development Planning

Category	No.	Data	Reason for examining
	41.	Source >150 m from home	Changes in water supply conditions
	42.	Dry season safe water	Changes in water supply conditions
	43.	Dry season unsafe	Changes in water supply conditions
Accessibility	44.	Roads Non-Earth	Changes in Internal Accessibility
	45.	Roads Earth	Changes in Internal Accessibility
	46.	Bridges	Changes in Internal Accessibility
	47.	Bridges	Changes in Internal Accessibility
	48.	Drainage Culverts	Changes in Internal Accessibility
	49.	Road Access	Changes in External Accessibility
	50.	Distance to Primary School	Changes in External Accessibility
	51.	Distance to Market	Changes in External Accessibility
	52.	Distance to Health Centre	Changes in External Accessibility

Abridged versions of the Data Books containing this information can be found online on the National Committee for Sub-National Development (NCDD) web site <http://ncdd.gov.kh/>. However, the latest data may not always be available from this site. Examples from the web site are shown below.

CDBonline
Commune Database Online

[English | ខ្មែរ]

Commune/Village Databook | Printable Format

Please select

Year Province District Commune

Sector General Information

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Visit us @ www.ncdd.gov.kh

For technical assistance, please mail to: NTA@ncdd.gov.kh

For more information, please contact Mr. Mean Thavrak,
Deputy Director of General Planning Department,
Ministry of Planning
Mobile : (855) 12 952 031
E-mail : Thavorah.Meany@yahoo.com

CDBonline
Commune Database Online

[English | ខ្មែរ]

Commune/Village Databook | Printable Format

Please select

Year 2008 Province Preah Sihanouk District Prey Nob Commune Prey Nob

Sector General Information

Commune/Sangkat Profile

Prey Nob

Year: 2008

Population

Family	2005	2006	2007	2008
Total number of families	1,136 families	1,162 families	1,165 families	1,209 families
Increase/Decrease		2.3%	0.3%	3.8%
Total population	persons	6,778 persons	6,605 persons	6,531 persons
Increase/Decrease		7.2%	-2.6%	-1.1%
Number of female headed household families	149 persons	206 persons	203 persons	201 persons

Note: Percentage of population increase/decrease is calculated on the basis of previous year.

Annex 2: Data from IDPoor Surveys (2004 – 12)

Examples from the 8 original pilot Communes.

