



TA 8179: Mainstreaming Climate Resilience into Development Planning, Package C:
Gender, Monitoring and Evaluation (M&E), and Mainstreaming at the Sub-National Levels



Best Practices at Sub-national Level Subnational Mainstreaming of Climate Risks

(Based on Pilots)

02 December 2019

National Committee for Sub-National Democratic
Development Secretariat (NCDD)



Updates

Skip this page before publishing!

Version 0 (9 October 2018):

Incomplete 1st draft for internal review (TA team and NCDDS)

Version 0b (20 October 2018):

Richard Hocking's edits incorporated throughout

Table 2 replaced

Some edits in Chapter 4

At the request of ADB, the preparation of the document was discontinued, to synchronize with the pilot projects

Version 1a (15 July 2019):

Various edits and elaborations throughout

Former Chapters 3 and 4 revised and merged with Chapter 2

New Chapter 4 added

5 abstracts added: B.5, B.6, B.8, B.14 and B.15

Version 1b (19 July 2019):

Various minor edits and elaborations throughout

Cheab Sam An's review incorporated, including expansion of Sections 2.3 and 2.5

No changes to the annexes (except the page numbers)

Version 1c (2 December 2019):

ADB's comments to Version 1b incorporated

Various edits and elaborations related to the completion of the NCDDS pilot projects

Old Section 2.5, '*The NCDDS pilot projects*', upgraded to new Chapter 3

Table 1 skipped, replaced by a new version of the former Table 2

No changes to the annexes

Contents

Acronyms and abbreviations	ii
Foreword.....	iii
Acknowledgement.....	iv
TA 8179, Package C, at-a-glance	v
About this document.....	vi
Executive summary	vii
1 Introduction.....	1
2 Pilot and demonstration activities	1
2.1 Scoping, targets and objectives.....	1
2.2 CCCA activities	5
2.3 LGCC activities	7
2.4 CamboWP activities.....	9
3 The NCDDS pilot projects	12
3.1 Objectives and selection procedure	12
3.2 Scope	14
3.3 A new community pond in Moung commune	15
3.4 Watergate and dam rehabilitation, Mokrea commune	16
3.5 Canal rehabilitation, Recheck and Chey Kampok Communes.....	17
3.6 Road rehabilitation, Koh Sampov Commune	18
4 Lessons learned	18
4.1 Observations from the CCCA activities	19
4.2 Observations from the LGCC Project.....	21
4.3 CamboWP observations	23
4.4 Observations from the NCDDS Pilot Projects	24
5 Good practices for sub-national CCA mainstreaming	24
5.1 The multiple benefits of CCA and DRR.....	25
5.2 Lessons learned from the pilot projects.....	27
5.3 Golden rules for strategic flood risk management.....	29
5.4 Private sector involvement.....	29
5.5 University syllabus for CCA and DRR	30
6 Supportive governance	31
6.1 Institutional capacity.....	31
6.2 Integrated management.....	32
6.3 A 'top-down' and a 'bottom-up' approach	34
6.4 Decentralization, deconcentration and community participation	35
6.5 Responsive and pro-active interventions	36
6.6 EIA and climate screening.....	36
7 Conclusion.....	37
References and literature	38
Annex A: Terminology	43
Annex B: Abstracts	45

Acronyms and abbreviations

ADB	: Asian Development Bank
CamboWP	: Cambodia Water Partnership
CC	: Climate change
CCA	: Climate change adaptation
CCCA	: Cambodia Climate Change Alliance
CCCSP	: Cambodia Climate Change Strategic Plan (2014-2023)
CPEIR	: Climate public expenditure and institutional review
DMF	: Design and monitoring framework
DRR	: Disaster risk reduction
IFS	: Integrated farming systems
IWRM	: Integrated water resources management
KP	: Knowledge product (thematic documents prepared under TA8179)
LGCC	: Local Government and Climate Change (project of NCDDS)
MCRDP	: Mainstreaming Climate Resilience in Development Planning (ADB TA 8179)
MoE	: Ministry of Environment
MoH	: Ministry of Health
MoI	: Ministry of Interior
MoP	: Ministry of Planning
MoWA	: Ministry of Women's Affairs
MRC(S)	: Mekong River Commission (Secretariat)
NAPA	: National Adaptation Programme of Action to Climate Change
NCCC	: National Climate Change Committee (2006-2015)
NCDD(S)	: National Committee for Sub-National Democratic Development (Secretariat)
NCDM(S)	: National Committee for Disaster Management (Secretariat)
NCSD(S)	: National Council for Sustainable Development (Secretariat)
NGO	: Non-governmental organization
O&M	: Operation and maintenance
PBCRG	: Performance-Based Climate Resilience Grant
PMSD	: Programme Management and Support Division (of the NCDDS)
PPCR	: Pilot Program for Climate Resilience
RGC	: Royal Government of Cambodia
SNA	: Sub-national administration
SPCR	: Strategic Programme for Climate Resilience
UNCDF	: UN Capital Development Fund
SIDA	: The Swedish International Development Cooperation Agency
TA	: Technical assistance
VRA	: Vulnerability reduction assessment

Foreword

Not that many years ago, food security was a national development priority. Today, however, Cambodia is in a healthy state of development, with economic growth sustained at around 7% per year. Nevertheless, recent events elsewhere in Asia (and around the World) show that development in itself is no safeguard against climate-related calamities, and climate change adaptation (CCA) and disaster risk reduction (DRR) remain important perspectives in Cambodia's continued social and economic development.

At the sub-national level, NCDDDS promotes mainstreaming of CCA and DRR through knowledge base development and capacity-building, action-oriented implementation modalities, identification and financing of pilot and demonstration activities, collaborating with various ministries, development partners, NGOs, and the private sector. Also, a close collaboration is maintained with the National Committee for Disaster Management (NCDM), its secretariat, and its sub-national bodies.

With this connection, the present document contributes some observations on good practices for sub-national CCA and DRR. The document, prepared by the NCDDDS team of TA 8179, Package C, includes lessons learned from the recent Local Government and Climate Change (LGCC) project, implemented by NCDDDS, as well as pilot and demonstration initiatives by the Cambodia Climate Change Alliance (CCCA), the Cambodia National Mekong Committee (CNMC), and the Cambodia Water Partnership.

Recognizing the significance of appropriate climate-related risk preparedness, the Royal Government of Cambodia has developed - and put into practice - clearly targeted policy responses and initiatives across all sectors and the entire society. Climate change policies and the concept of '*green growth and sustainable environment*' are important elements of the National Strategic Development Plan (NSDP) 2014-18 and will remain so for the next NSDP.

As an active participant in Cambodia's Strategic Programme for Climate Resilience (SPCR), NCDDDS appreciates the support provided under TA8179, Package C, and looks forward with confidence to a continued fruitful collaboration.

H.E. Ngan Chamroeun

Secretary of State, Ministry of Interior and Head of NCDD Secretariat

Acknowledgement

The NCDDS TA team extends its sincere thanks to HE Mr. Ny Kimsan, Deputy Head of NCDDS and Director of its Programme Management Support Division, and Mr. Long Viseth, Deputy Director of PMSD/NCDDS and Project Coordinator of the SPCR, for their indispensable support and highly appreciated guidance throughout the TA implementation.

The team highly appreciates the collaboration with the executing agency (MoE), with the NCDDS executives and staff, and with the MoP and MoWA teams and counterparts.

Many SNA representatives and resource persons have shared their insights and added to the relevance of the present document during their active participation in the orientation and training sessions and the quarterly meetings held under the NCDDS Component of the TA.

Dr. Ancha Srinivasan, Principal Climate Change Specialist, ADB, and Ms. Valerie B. Pacardo, Consultant, ADB, have provided valuable coaching and specific guidance during the preparation process.

The team looks forward with confidence to a continued close collaboration towards successful completion of the TA.

Akhteruzzaman Sano

Team Leader, Package C of the ADB TA 8179

TA 8179, Package C, at-a-glance

The '*Mainstreaming Climate Resilience into Development Planning*' (MCRDP) project is being executed under the Strategic Programme for Climate Resilience (SPCR) by Cambodia's Ministry of Environment (MoE) and the Cambodia Climate Change Alliance (CCCA) (an inter-agency network) with financing provided via ADB from the Strategic Climate Fund's Pilot Program for Climate Resilience (PPCR) and the Nordic Development Fund.

The objective of the MCRDP is to strengthen the capacity of Cambodian institutions and stakeholders in order to integrate climate concerns into development plans, programs and projects.

Package C of the MCRDP is executed by Ministry of Environment. It covers '*Gender, Monitoring and Evaluation, and Mainstreaming at Sub-national Levels*'. Consultancy services for Package C were initiated in August 2016 under a TA contract between ADB and UN-Habitat in association with Forum Syd and Save the Earth Cambodia. The TA is scheduled for completion by end of 2019.

Package C has 3 outcomes:

- 1 (Implemented by NCDDDS): Enhanced capacity to mainstream climate resilience at sub-national levels.
- 2 (Implemented by MoWA): Enhanced institutional and technical capacity to integrate gender concerns in climate change initiatives.
- 3 (Implemented by MoP): Enhanced institutional and technical capacity for monitoring, reporting and evaluation of adaptation investments.

These outcomes have been produced by NCDDDS, MoWA and MoP, respectively, with a TA-cum-counterpart team hosted by each organization.

The present document has been prepared by the NCDDDS team.

About this document

Context and rationale

This document is No. 6 in a series of 12 '*knowledge products*' (KPs) (guidelines and thematic reports) to be prepared under TA8179, Package C.

Considered as a '*stand-alone*' document, the report includes some overlaps with knowledge products 1, 4 and 5 (that also covered the sub-national perspective of disaster risk reduction and climate change adaptation).

The title of the document has been slightly altered, from the specified '*best practices ...*' to '*good practices ...*', considering that '*the best can be the enemy of the good*'.

Objective

The document aims to:

Compile observations from various recent climate-related pilot and demonstration projects in Cambodia, as a basis for an assessment of good practices for sub-national climate change adaptation (CCA) and disaster risk reduction (DRR).

Methodology

The analysis is based on observations from previous related development initiatives, notably the recently completed Local Government and Climate Change (LGCC) project (2011-16), and pilot projects implemented under the Cambodia Climate Change Alliance (CCCA) (2011-16).

Comprehensive guidance has been provided by NCDDS and by representatives from the province, district and commune levels participating in the workshops and liaison meetings under the NCDDS Component of the TA.

Applied definitions

Terminology applied in this document is briefly explained in Appendix A.

'*Adaptation*' is taken as adjustment to new circumstances - actual or expected. This can be in terms of behaviour, technology or structural intervention. '*Climate change adaptation*' (CCA) is measures - structural or non-structural - to reduce the adverse consequences of climate change. Examples include awareness-building and '*social marketing*'; introduction of more resilient production systems and infrastructure; appropriate land use ('*keeping people away from floods*'); flood protection schemes ('*keeping floods away from people*'); weather and flood forecasting services; improved water storage capacity; shoreline protection; saline intrusion control; crop insurance; supportive financing, including microcredit; etc.

A '*disaster*' is a sudden event with significant adverse impacts - such as a flood, a land slide, or a severe drought. '*Disaster risk reduction*' (DRR) is measures - structural or non-structural - to reduce the risk that a disaster occurs, or to reduce its adverse consequences. '*Vulnerability*' is the extent of the (adverse) impacts of a given climate change exposure or a given disaster. The vulnerability can be seasonal, and is always site-specific, depending on the population density, the land use, the value of buildings and infrastructure, the cultivation systems and other production systems, the preparedness, and the resilience. '*Resilience*' is the ability to endure and/or to recover from a given exposure. A high resilience indicates a low vulnerability, and the other way around.

Executive summary

TA 8179, Package C, covers '*gender, monitoring and evaluation, and mainstreaming at sub-national levels*'. Package C is executed by MoE, with three implementation partners: MoP, MoWA and NCDDS. A TA-cum-counterpart team is hosted by each of these.

The present document has been prepared by the NCDDS team. It compiles some lessons learned on good practices for sub-national mainstreaming of climate risks, extracted from the numerous recent climate-related pilot and demonstration activities in Cambodia.

Observations from these activities clearly confirm the inter-dependency and positive interaction between climate change adaptation, disaster risk reduction, sustainable livelihoods and improved incomes, public health, reduced waste generation and orderly waste disposal, and a healthy environment.

Sub-national climate change and disaster resilience can be improved by measures such as the following:

- Access to safe water, sanitation and electricity.
- Improved, reliable water availability for cultivation.
- Flood protection (structural and non-structural), and drought preparedness and mitigation.
- Improved, responsive extension services, supported by national knowledge-sharing and networking.
- Improved land use planning.
- Reduced generation and orderly disposal of solid waste and wastewater.
- Knowledge base development – an objective in its own right.
- Public awareness of '*good practices*': Public health, water and energy utilization, use of fertilizers and pesticides, and timely and orderly response to adverse events.

Successful achievements are supported by active participation by involved communities and institutional stakeholders (including the implementing SNAs), as well as the private sector and the academic community, as appropriate from case to case.

There is a clear scope for continued and expanded liaison, knowledge-sharing and active collaboration, '*horizontally*' (between sectors and administrative bodies at each level), as well as '*vertically*', reaching all the way from the national government to the provinces, districts and communes, down to the community and household level. This includes continued support to coordination bodies such as the National Committee for Disaster Management (NCDM) and its sub-national bodies, and the National Council for Sustainable Development (NCSD).

The applied terminology is explained in Annex A. Annex B provides concise abstracts of some related documents.

1 Introduction

The Design and Monitoring Framework (DMF) of TA8179 Package C includes the following outcome, output and activity:

- 1 Enhanced capacity to mainstream climate resilience at sub-national levels;
 - 1.1 Institutional and technical capacity of sub-national governments in mainstreaming climate resilience improved;
 - 1.1.7 Prepare guidelines, tools and targeted knowledge products to enhance awareness of approaches to mainstreaming at provincial, district and commune levels.

The present KP-6 has been prepared accordingly.

Other, closely related knowledge products under the NCDDS component of the TA are KP-1: *'Mainstreaming climate resilience in provincial, district, and commune development and investment plans'* (October 2017); KP-4: *'Innovative financing schemes for mainstreaming climate resilience at provincial, district and commune levels'* (November 2017); and KP-5: *'Assessment of opportunities and barriers for climate change adaptation at the district and commune levels'* (July 2018) (which includes observations from elsewhere in Asia).

Other related KPs have been or are being prepared under the MoP and MoWA components of the TA.

2 Pilot and demonstration activities

Many pilot and demonstration activities have been completed in Cambodia in recent years in support of CC adaptation and disaster risk reduction, for example by Cambodia Climate Change Alliance (CCCA) and the Local Government and Climate Change (LGCC) project. Also, Cambodia Water Partnership has piloted good practices for community-based CC adaptation and disaster risk reduction. Observations and lessons learned are summarised in this and the following chapters.

2.1 Scoping, targets and objectives

Source: CamboWP (January 2017)

Climate-related pilot and demonstration activities can, from case to case, address various levels and perspectives – sometimes separately, but often in various combinations, in pursuit of *'multiple benefits'*:

Households:

- Access to safe water, sanitation and electricity for rural households in particular.
- Early flood and storm warning services, and awareness of appropriate responses.
- Groundwater wells where feasible (along with rehabilitation of some degraded wells and ponds).
- Improved solid waste collection and disposal, and related awareness-building, particularly in rural areas (services are better in the towns). Waste dumps are unavailable in some places. There may be a scope for micro-incinerators, serving

somewhere around 10 households. Guidance and capacity-building on waste recycling.

- Protection against calamities: Outbreaks of water-related diseases, floods, landslides, violent storms, drought and forest fires.
- Awareness on the risk of lightning.
- Restoration of degraded water sources and reservoirs.
- The resilience of houses can be improved by better design and construction.
- Tree planting (for shelter, around homes, between fields and along roads) is regarded as an attractive adaptation option with multiple benefits. This will require training and access to saplings. Private sponsorships may be sought for the purpose.
- Rainwater harvesting at the household or community level, including support for construction of village tanks, ponds, canals and other forms of water storage).
- Appropriate sewage disposal and appropriate stormwater drainage.

Agriculture:

- Access to water for production and livelihoods.
- Appropriate, well-informed use of fertilizers and agricultural pesticides.
- Bee keeping, honey production.
- Cultivation can be improved (and made more resilient) by better seeds and improved practices, including soil management (using compost), supported by education on agricultural techniques. Rotation cropping can improve the soils and reduce the vulnerability to insect attacks.
- General diversification of agricultural production systems, growing crops other than rice; livestock; and aquaculture.
- Improved extension services (climate-resilient cultivation technology, use of fertilizers and pesticides, appropriate and timely response to pest attacks, and crop and livestock diseases, better livestock breeds).
- Improvement of irrigation systems (including rehabilitation and occasional expansion of canals, ponds, lakes and wells). In case some areas have no water sources, basins/ponds can be constructed if appropriate. Some lowland areas need protection against saline intrusion.
- Land use and soil management.
- Mitigation of post-harvest and processing losses.
- One or several small agricultural experiment stations for investigating new varieties in the context of local soil and weather conditions (expectedly under CARDI).
- Production of fodder should be encouraged. Also, better cow, ducks, chickens, pigs and fish breeds should be promoted.
- Promotion of composting as a low-cost, low-risk and multiple benefit adaptation option suited for household implementation (as well as larger scale facilities).
- Shift - on a well-informed basis - from traditional rainfed long-term rice varieties to high-yield medium- and short-term varieties. This uses new seeds and fertilizer as appropriate, with 2 crops per year where practical.
- Soil, land use and climate change hazards mapping and soil management.

- Storage capacity and operation, including multi-purpose operation of reservoirs.
- Supplementary small-scale dry season cultivation where water is (or can be made) available.
- Support to agricultural water efficiency and value chains.
- Support to bio-gas production.
- There is a need of better use of chemical fertilizers and pesticides.
- Tree planting around the fields, ponds and natural lakes.
- Upgrading of irrigation schemes.

Other production systems and livelihoods:

- Capacity building on aquaculture and fish processing.
- Capacity building or exchange learning on non-timber forest production for upland communities.
- Development of tourism and recreation.
- Encourage the 'One Village One Product' scheme.
- Energy/electricity development for communities.
- Upgrade and improve saving groups and access to saving accounts.
- Support to micro-businesses, implemented in collaboration with the private sector.
- Vocational training, implemented in collaboration with the private sector, in support of livelihoods outside the agricultural sector, reflecting steadily increasing demands for skilled labour for production and services (including tourism).

Infrastructure:

Infrastructural development initiatives cover both rural and urban areas in partly different ways:

- Development of orderly wastewater treatment and disposal in urban areas.
- Construction/restoration/capacity improvement of reservoirs, ponds, canals and irrigation systems.
- Drought preparedness, including contingency planning and seed banks.
- Flood protection for low-lying communities and rice fields.
- Improved stormwater drainage capacity - an urgent priority, both in urban and rural areas.
- Improved treatment and disposal of industrial effluents, including waste re-cycling, on-site pre-treatment of sewage, sludge disposal, and management of non-degradable contaminants.
- Promotion of appropriate solid waste disposal with a distinction made between, urban and rural areas when considering the scope of re-using, re-cycling or composting. There is a scope for improved solid waste collection and disposal and related awareness-building, particularly in rural areas (services are better in the towns). Local waste collection dump sites are unavailable in some places.

- Appropriate septic tank and latrine collection unit operation and maintenance (in urban, peri-urban and rural areas) (possibly implemented through public-private partnerships).
- Stormwater drainage in urban and rural areas.
- Structural flood protection (dykes, gates, pumps).
- Weather monitoring and early warning services (EWS).

Ecosystems:

- Management of headwater areas, reservoir catchments, wetlands, active floodplains, and natural reserves, including generation of healthy vegetation cover as part of storm protection and runoff and soil erosion control.
- Monitoring and regulation of mining and sand extraction.
- Morphological management of the rivers on a well-informed basis.
- Research on aquatic habitats and ecosystems.
- Tree planting around houses, rice fields and roads for storm protection.

Institutional aspects:

- Land use planning considering risk exposure (seasonal floods, flash floods, landslides).
- '*Climate screening*' (assessment of climate-related impacts and opportunities) conducted along with EIAs on a routine basis whenever relevant.
- Continued stakeholder dialogue and networking, seeking guidance and directions on evolving development needs and opportunities.
- Institutional capacity-building.
- Liaison with the private sector.
- Liaison with the academic community (including seminars and roundtable consultations).
- Support to farmer / water user / forest / fisheries communities.

Knowledge base:

- Baseline studies.
- Decision-support for water allocation.
- Improved hydro-meteorological and morphological monitoring.
- Inventory of water availability, present and future water demand, and actual water uses.
- Mapping of particular water-related assets (lakes, wetlands, waterfalls, scenic views).
- Monitoring of drinking water quality and fish, meat, vegetable and fruits contamination.

Awareness-building:

- Awareness campaigns, 'social marketing'.

- Regular state-of-the-environment reporting (covering environmental, social and economic conditions and trends), with policy briefs and recommendations to decision-makers.
- General public awareness-building and understanding of climate-related concerns and adaptation opportunities, including '*good practices*' for water utilization, waste generation and waste disposal.

Different initiatives can in many cases add value to each other. Many of the options have social, economic and environmental benefits that reach well beyond the scope of climate change adaptation: Livelihoods development and poverty alleviation interact positively with water security and climate change and disaster risk resilience. Also, a healthy environment (supported by predictable regulation) will support a good investment climate: experience from economically prosperous countries clearly shows that investors can readily accept strict regulation, provided that it is transparent and predictable.

Many of the potential initiatives can be implemented in a meaningful way within a broad range of costs – '*economy of scale*' does not always apply; but some resources must be earmarked for documentation and dissemination.

2.2 CCCA activities

The Cambodia Climate Change Alliance (CCCA) has undertaken many CC-related pilot and demonstration initiatives reflecting priorities identified in the Cambodia National Adaptation Programme of Action (NAPA), including two major programmes in the coastal provinces of Cambodia:

The '*Coastal Climate Change Vulnerability Assessment, Adaptation and Resilience Planning (VAAP) Component*' was implemented in 2012-16 with support from UNEP/GEF.

Activities included vulnerability assessment and adaptation analyses and participatory development of province-level adaptation plans through a practical learning-by-doing capacity building exercise involving national and sub-national stakeholders. The component applied innovative approaches from Ecosystem Based Adaptation (EBA), and aimed at removing or alleviating key barriers to strengthened adaptive capacity and resilience in the participating communities.

CCA was supported by piloting of climate-resilient farming, climate resilient irrigation, and infrastructure resilience. An extensive CCA awareness and training programme was developed and implemented, interacting with a number of pilot and demonstration activities, and guidelines and training manuals were prepared for integrating climate change considerations into commune-level development plans and investment programming.

More than 4,000 households were trained. A video on '*good practices*' was produced and shown on three national TV channels, along with a debate programme involving student youth groups.

The '*Coastal Adaptation and Resilience Planning*' (CARP) Component (2011-16) was financed by the CCCA Trust Fund (Danida, EU, Sida and UNDP). The Component was implemented with a background of low productivity, poor soils, and exposure to storms, floods, droughts, saline intrusion, and pests and diseases. It was oriented towards two outcomes:

- 1: Improved climate change knowledge integrated into land-use and sub-national development plans.
- 2: Increased resilience of coastal communities and coastal ecosystem buffers to climate change, and improved livelihoods.

Pilot and demonstration activities were conducted in selected target communes in Koh Kong and Preah Sihanouk Provinces in 2013-14, and included

- 1 Climate-resilient integrated farming.
- 2 Livelihoods improvement for Peam Krasoab Fishery Community.
- 3 Introduction of improved rice varieties and vegetables.
- 4 Improved livestock breeding and livestock revolving funds.
- 5 Investments for climate change adaptation integrated in the commune development planning (with support for implementation).
- 6 Training and awareness-building on climate adaptation.

A close collaboration was maintained with the districts and the commune councils.

Achievements included:

- A basic analysis of prevailing production systems.
- Development of curriculum and 7 training modules: Rice, vegetables, chicken, pigs, aquaculture, saving groups, and water storage facilities.
- Training-of-trainers for 30 extension officers from provincial and district Departments of Agriculture.
- Exchange visits for 30 officers and farmers.
- 31 farmer field schools/field days.
- 20 on-farm demonstrations and 8 field days for the improved understanding of rice cultivation, pig and chicken breeding, vegetable cultivation and fish farming (1,452 farmers, including 761 women).
- Construction of 175 storage facilities for water harvesting.
- Formation of 31 saving groups (858 farmers, including 584 women) with project support of 83,700 USD.

The following benefits of the pilot and demonstration activities were highly appreciated by the intended beneficiaries (rated between 86 and 94 on a scale from 0 to 100):

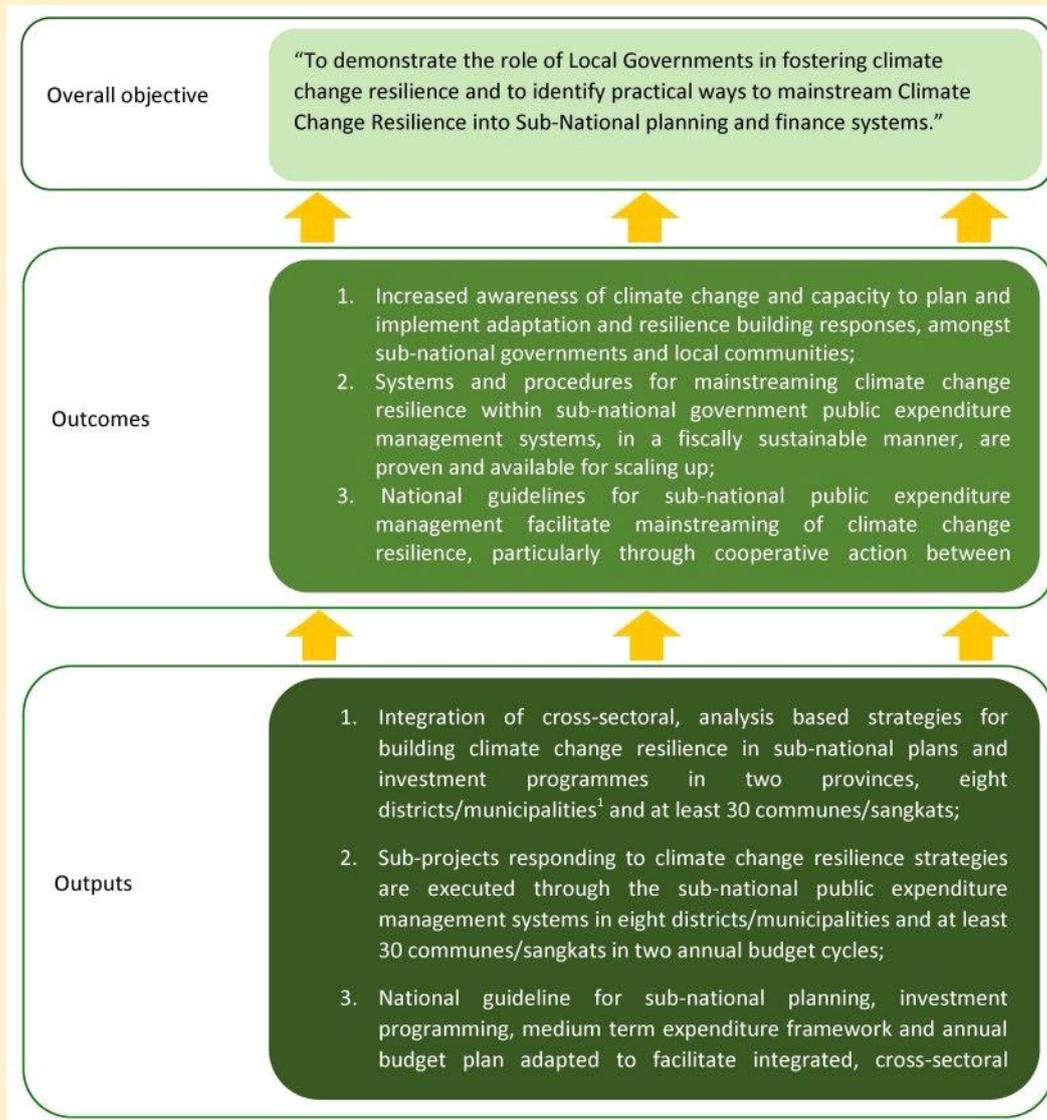
- Improved livelihoods.
- Improved income.
- Improved understanding of CC.
- Environmental benefits.
- Improved fish yield.
- Improved access to water for households.
- Improved cultivation.
- Improved livestock breeding.

- Improved drought resilience.
- Improved flood resilience.
- Reduced exposure to saline intrusion.

2.3 LGCC activities

The Local Governments and Climate Change (LGCC) Project (2011-16) was Cambodia's country project of the UNCDF's Local Climate Adaptive Living (LoCAL) programme. LGCC was implemented by NCDD-S with financial support from the Swedish International Development Agency (SIDA).

Figure 1: LGCC outputs and outcomes



Source: LGCC (March 2017)

By the end of the project, Outcome 1 was evaluated as *'fully achieved'*, while Outcomes 2 and 3 were evaluated as *'largely achieved'*.

LGCC has provided Performance Based Climate Resilience Grants (PBCRGs) to co-finance climate-adaptive investments in eight districts in Battambang and Takeo provinces and their communes: 43 infrastructure projects and 22 non-infrastructure projects, with 221,000 direct beneficiaries of whom 43% were female. 18 of the infrastructure projects required environmental impact assessments, and two required activation of land acquisition safeguard procedures.

Infrastructural projects included construction, upgrading or rehabilitation of rural roads, dams, canals, ponds and culverts, digging wells, and the construction of a school. Non-infrastructural initiatives included agricultural extension services, model farming, tree planting, cassava cultivation, promotion of the use of water filters, appropriate garbage disposal, education and awareness-building on CCA, public health, protection of the environment, and gender mainstreaming.

Figure 2: Land degradation



*Photo from the Samlot protected area, Battambang Province
Phnom Penh Post 30 August 2018*

Four sets of indicators were applied for rating the candidate projects:

- 1: Project quality indicators.
- 2: Process quality indicators.
- 3: Beneficiaries indicators.
- 4: Sub-national climate change mainstreaming index.

Implementation of PBCRG projects under LGCC was subject to the relevant guidelines of the District/Municipal Fund (for district level implementation) and the Commune/Sangkat Fund for commune level implementation. Both these guidelines include *safeguard procedures* for environmental risk, land acquisition and protection of the rights and interests of indigenous peoples. These safeguard procedures were developed in cooperation with the World Bank and conform to World Bank standards.

Furthermore, the LGCC has supported NCDD-S in developing the regulatory framework and building capacity to mainstream climate change adaptation in the sub-national development plans and investment programmes.

Manual for performance based grants to sub-national administrations
(NCDDS August 2018)

A Performance Based Grant (PBG) is a grant that includes an incentive for good performance by the grantee. Usually, good performance in one budget year results in an increased grant in the next year.

This manual defines the framework for management of PBGs from NCDD-S to sub-national administrations (SNAs). The manual applies to the management of performance-based climate resilience grants, and to other types of performance-based grant, subject to agreement with the donor agency. It describes the framework for PBGs, and provides guidance on their design. Information is provided about gender mainstreaming; environmental and social safeguards; and communications and complaints handling. A proforma for a PBG application document is included as an annex.

Performance assessment manual
NCDDS (September 2018)

An annual performance assessment must be conducted in each SNA that receives a Performance Based Grant (PBG). The performance assessment is based on specific performance measures that, between them, provide a performance score. The assessment covers the compliance with the priorities in the District Climate Change Strategy, as well as the PBG terms and conditions, and how well the district has improved its capacity for climate change adaptation. Observations are carried forward to the national monitoring of the PBG programme.

This manual provides a detailed description of the (rather comprehensive) assessment procedures and reporting. A performance assessment form is attached as an annex, as well as a guideline for participatory evaluations.

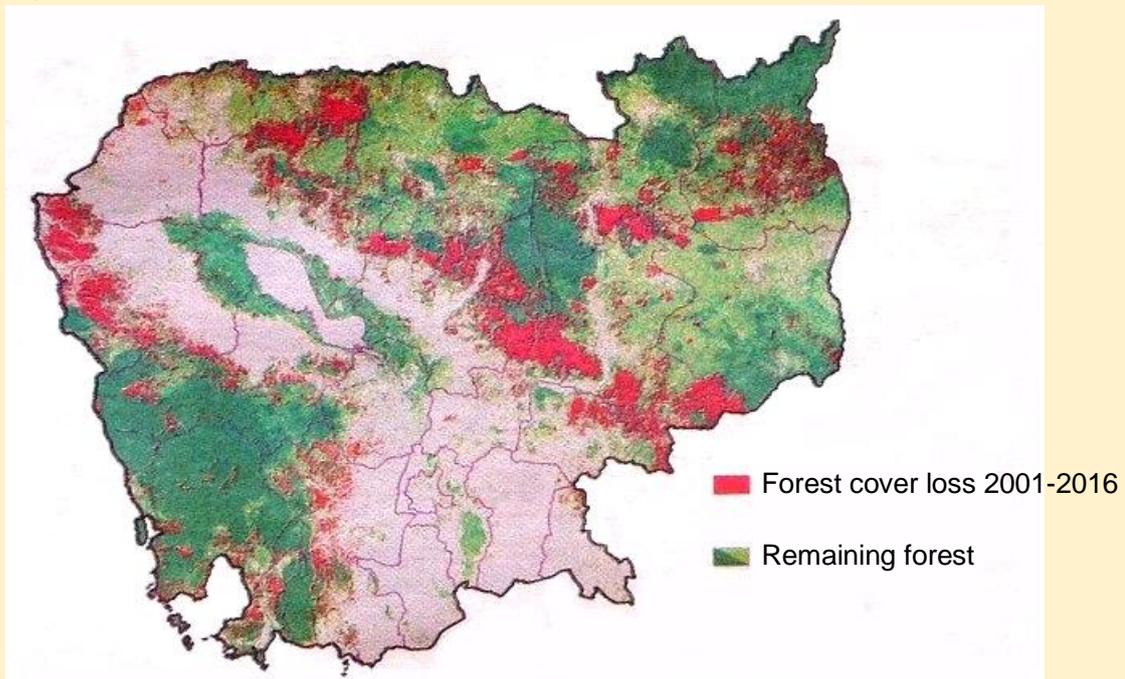
2.4 CamboWP activities

In 2016-17, Cambodia Water Partnership (CamboWP) conducted a situation analysis and outline of a water security framework for the 4-Ps Area, as an activity under the Water, Climate and Development Programme (WACDEP).

The 4-Ps Area (12,500 km²) is located in two provinces (Kratie and Mondulkiri) in the north-eastern part of Cambodia. It is formed by the drainage basins of four *preks* (small rivers) that discharge into the Mekong: Prek Preah, Prek Krieng, Prek Kampi and Prek Te. The area is located on the eastern (or left) bank of the Mekong.

The area covers some 7% of Cambodia's entire area and has a population of some 143,000 persons (or 1% of the national population). Only around 1% of the area is cultivated (excluding plantations and orchards), with a quarter of the cultivated areas served by irrigation infrastructure. The major parts are covered by forests, in various states of degradation, and forest plantations.

Figure 3: Deforestation in Cambodia 2001-2016



Source: *Phnom Penh Post* 10 October 2017, quoting Hansen/USD/USGS/NASA

The area is among the least developed parts of Cambodia. The poverty rate is among the highest in the country as well is the occurrence of malnutrition and water-borne diseases.

- The area and its immediate surroundings feature several protected areas. Significant water-related assets include the community of freshwater dolphins living in the Mekong upstream of Kratie.
- All the 4-Ps sub-basins are prone to flash floods caused by extreme direct rainfall, typically released by tropical depressions or typhoons making landfall on the Vietnamese coast. The typhoon season coincides with the period of heaviest rainfall in the area (August to September). Seasonal floods are generated by the Mekong on its adjacent floodplains. The two types of floods can exacerbate each other.
- Apart from flooding, the rainfed cultivation in the area can be severely affected by dry spells in the early, mid or late rainy season.
- There are strong indications that erratic rainfall events are becoming more frequent due to global climate change. This includes extreme rainfall as well as drought. Also, the monsoon pattern itself may become more irregular. Furthermore, the frequency of severe storms may increase.
- Water security perspectives include (i) healthy and prosperous households; (ii) efficient production systems and sustainable livelihoods; (iii) pleasant and functional cities; (iv) a healthy environment (headwater areas, habitats, ecosystems); (v) flood and drought preparedness; and (vi) appropriate land use.
- There is a general need of strengthened extension services in support of sustainable and resilient rural livelihoods.
- There is a general scope for headwater area protection/rehabilitation, possibly involving forest communities.

- Sewage and solid waste generation and disposal can be improved, supported by better use of (existing) EIA requirements.
- General concerns include post-harvest losses; poor practices for solid waste disposal (including plastic bags); and contamination of edible fish by agricultural residues

Prek Preah

- There is still some shifting cultivation in remote mountainous areas.
- Floods and drought are severe pressures.
- There is one deep groundwater well, but the water has a bad smell.
- In 2016, the rice yield was affected by water shortage.
- The livestock is affected by diseases.
- Use of surface water from the rivers causes diarrhoea.
- In some areas, water for households must be collected from far away, wasting time.
- The electricity grid is presently being extended.
- Guidance is requested on household-level rainwater harvesting and water governance; and on better suited rice varieties.
- In-stream storage (by temporary weirs) is a potential option.
- Options include improved access to safe water and sanitation, improved sewage and solid waste disposal, tree planting (to break the wind around houses and fields, and to restore healthy headwater areas), and strengthened extension services.

Prek Krieng

- Severe flash floods occurred in 2013. There were also floods in 2015 while there was a water shortage in 2016 affecting the rice yield.
- There is a lack of safe drinking water, causing human health problems.
- Irrigation facilities are not available.
- Navigation is impeded in the dry season.
- There is some deforestation, land degradation, and declining wildlife.
- The fish yield is decreasing due to lack of compliance with regulation.
- There are five forestry communities, but no farmer water user communities in this area.
- There is a scope for community-based initiatives, such as household/village ponds and small-scale storage.
- A 200m clearance zone should be imposed around forests.
- There is a scope for improved practices for use of agrochemicals.
- A waste disposal site is needed.

Prek Kampi

- There is a pronounced water shortage in the dry season affecting public health and livestock. There is a need for ponds and in-stream storage.

- Access must be improved to safe water and electricity.
- There is some recession irrigation and small-scale pump irrigation, but a general need for extended irrigation infrastructure exists.
- Shifting cultivation has nearly ended in this area. There are some economic land concessions affecting the land use.
- There is one (new) forestry community in this area.
- People living near the Mekong have had to re-locate due to the flood risk.

Prek Te

- The dry season flow is affected by land degradation.
- Dry season water shortages affect human health, livestock and cultivation, particularly in the downstream areas.
- Better weather forecasts must be disseminated to the farmers. The information must be more credible than today's sporadic and inaccurate forecasts received via Facebook.
- There is one forestry community in this area, but a scope for more. They can generate livelihood opportunities and support forest cover conservation.
- The FWUCs need technological support.
- There is a scope for cultivation communities collaborating with the FWUCs – a potential for one community for each stream can be further assessed.
- There is a need for extended irrigation infrastructure, and for expanding the electricity grid.
- Land use planning should be applied.
- Farmers need to learn about the appropriate use of fertilizers and pesticides.
- Water pollution is caused by gold mines, industries, and cassava processing.

3 The NCDDS pilot projects

3.1 Objectives and selection procedure

The objectives for implementation of pilot projects under the NCDDS component are:

1. Demonstration of climate adaptation practice through small-scale rural infrastructure under NCDDS management.
2. Demonstration of institutional capacity for CCA project implementation on district and commune levels.
3. Demonstration of a smooth flow of funds from national to sub-national levels.
4. Documentation of the implementation phase.

A (fully participatory) procedure aimed at a portfolio of candidate projects that are clearly beneficial, feasible and implementable. Clear criteria were applied for identification, long-listing and shortlisting, in a close and active collaboration with the involved SNAs, the affected communities, and ADB. The procedure was implemented as follows:

In mid 2017, a long-list of candidate projects was compiled across the target districts, with guidance from the SNAs, and an initial screening was conducted, considering the following criteria:

- 1 Budget
- 2 Duration
- 3 Example of innovative or replication
- 4 Perceived benefits for climate resilience
- 5 Perceived additional benefits (across livelihoods, resource conservation, and the environment)
- 6 Perceived significance for capacity-building

The candidate pilot activities could be '*innovative*', or they might aim at consolidation or replication of previous or ongoing pilot activities. They could be structural, or non-structural, or a combination.

The long-listing provided 7 candidate projects in Moug Roessei district; 6 long-listed candidate projects in RukhaKiri district; 3 long-listed candidate projects in Preah Sdach district; and 7 long-listed candidate projects in Peam Chhor district. These were reviewed by the SNAs, and the various implementation practicalities were considered. A workshop was then organized (in January 2018 in Kampong Chhnang) to compile the shortlist with involved stakeholders from SNA levels.

The following compulsory criteria were applied:

- The proposed activity must be suited for immediate implementation
- It must be supported by the intended beneficiaries and by the involved target province/district
- It must be a '*stand-alone*' activity (that does not depend on uncertain external services or funding)
- The budget must be 50,000 USD per activity, or less

The following supplementary guiding criteria were applied, giving preference to initiatives that

- can provide visible progress within a short (6-months?) time frame;
- Involve fully-functioning, existing water user communities, cultivation communities, or forestry communities;
- can generate increased, sustainable rural incomes (in addition to CC resilience); and/or
- support capacity-building within and around the activity (including within the district and province administrations).

Next, based on the shortlisting criteria, a scoring matrix was developed where each shortlisted project was scored on a scale between 0 and 5 against each criterion. Weights were then applied to each criterion, depending on its significance to long-term climate resilience, and a total score was applied for ranking the projects. The resulting selection of a project in each target district was confirmed during consultations with local community members and representatives of target district and commune authorities, as well as key NCDD-S representatives and ADB.

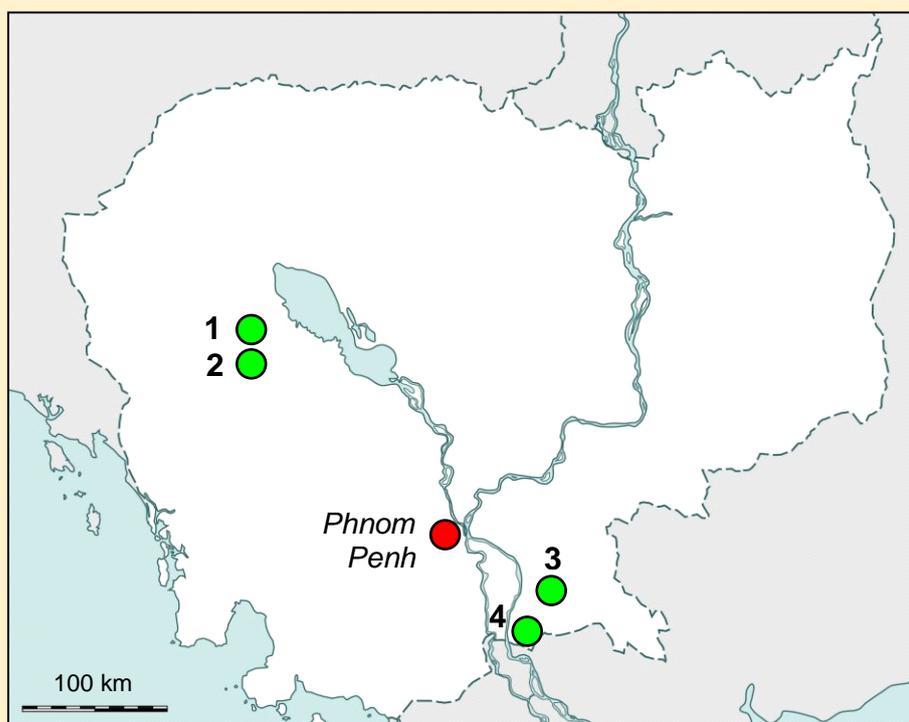
Hereby, the pilot projects listed below were selected for implementation. All of them are *'structural'*, related to rural roads and/or water management, and 3 projects aimed at rehabilitation of existing, degraded infrastructure.

Detailed design, financing practicalities and M&E modalities were planned in consultation with NCDDS and MoE (as the TA879 executing agency), and the final, revised project proposals were endorsed by ADB in May 2019.

3.2 Scope

The locations of the pilot projects are shown below, and the scope of each project is summarized in the following table.

Figure 4: Location of the NCDDS pilot projects under TA8179, Package C



- 1 Reducing vulnerability to drought
Moung Commune, Moung Roousei District, Battambang Province
- 2 Reducing vulnerability to drought
Mokrea Commune, Rukhakiri District, Battambang Province
- 3 Reducing vulnerability to drought
Recheck and Chey Kampok Communes, Preah Sdach District, Prey Veng Province
- 4 Reducing vulnerability to flooding
Koh Sampov Commune, Peam Chhor District, Prey Veng Province

Table 1: Pilot projects under the NCCDS Component of TA8179, Package C

No.	Description	
1	Objective	Reducing vulnerability to drought
	Location	Moung Commune, Moung Roousei District, Battambang Province
	Elements	Community pond, 62 m long, 40 m wide, with 1 concrete stair and 1 signboard
	Outputs	1 Feasibility screening, design and specifications 2 Construction of community pond 3 Project maintenance committee established (18% female); initial training provided
	Costs	19,100 USD
2	Objective	Reducing vulnerability to drought
	Location	Mokrea Commune, Rukhakiri District, Battambang Province
	Elements	Spillway 15 m x 13.4 m, 2 m high, with 2 wooden gates; repair of dam (100 m long, 5 m wide); 1 signboard
	Outputs	1 Feasibility screening, design and specifications 2 Rehabilitation of canal with roads 3 Project maintenance committee established (5% female); initial training provided
	Costs	40,600 USD
3	Objective	Reducing vulnerability to drought
	Location	Recheck and Chey Kampok Communes, Preah Sdach District, Prey Veng Province
	Elements	1,050 m of earth canal rehabilitated, 2 m bottom width and 9 m top width; construction of 2 pipe culverts (1m diameter, 10m long); 1 signboard
	Outputs	1 Feasibility screening, design and specifications 2 Construction works 3 Project maintenance committee established (11% female); initial training provided
	Costs	38,200 USD
4	Objective	Reducing vulnerability to flooding
	Location	Koh Sampov Commune, Peam Chhor District, Prey Veng Province
	Elements	Rehabilitation of 650 m of earthen road with mountain laterite surface; installation of 2 single pipe culverts; 1 signboard
	Outputs	1 Feasibility screening, design and specifications 2 Rehabilitation and climate proofing of earthen road with laterite surface 3 Project maintenance committee established (12% female); initial training provided
	Costs	50,100 USD

3.3 A new community pond in Moung commune

A site visit to Moung commune in May 2018 confirmed that many farmers are seriously affected by shortages of water for households and for cultivation, sometimes even in the

wet season, if the dry season lasts longer than expected, or if a dry spell occurs early in the wet season.

Accordingly, this pilot project established a community pond with concrete stairs, providing water for households and irrigated cultivation.

The initiative provided improved access to water for both agricultural and domestic use throughout the year and dramatically reduce the amount of time and related opportunity costs incurred while collecting or accessing water, including significantly improved livelihoods for 129 households (25 ID-poor households), with a total population of 645, of which 40% are female, through strengthened adaptive capacity and reduced exposure to climate risks.

3.4 Watergate and dam rehabilitation, Mokrea commune

Figure 5: Mokrea commune: Watergate in urgent need of rehabilitation (May 2018)



This project has improved the drainage capacity through construction of a spillway with water gate and 100 m of dam rehabilitation. Benefits include maintenance of the water level for irrigation of crops, domestic use, livestock, and home gardens in a drought-prone area; and facilitating travel and access to market for farming-related inputs and outputs between market and farms.

Hereby, the livelihoods have been significantly improved for 1,198 households, with a total population of 5,615, of which 50% are female, including 269 ID Poor households, through strengthened adaptive capacity and reduced exposure to climate risks.

The number of indirect beneficiaries will be much higher, potentially supporting around 49,000 people in Rukhakiri district that depend on cultivation for their livelihoods.

3.5 Canal rehabilitation, Recheck and Chey Kampok Communes

Figure 6: Preah Sdach: Canal in need of climate adaptation and resilience



Figure 7: Upgrading nearly completed



This canal is an inter-commune canal and road rehabilitation connecting the main canal (Bophear Canal), the Kbal Lapheak Canal and a secondary canal crossing two communes through three villages – Tanal Village (Recheck Commune), and Chey Kampok and Snar Villages (Chey Kampok). The canal can provide irrigation in the rainy and the dry seasons, as well as contributing to reducing the flood risk.

Its upgrading has supported climate-resilient and sustainable livelihoods and income generation for 613 households (3,066 people, of which 50 percent are female) through improved adaptive capacity from the rehabilitation of a canal-cum-road to safe and climate-resilient condition with bank vegetation for erosion control.

The number of indirect beneficiaries will be much higher, potentially supporting around 72,000 people in Preah Sdach District that depend on cultivation for their livelihoods.

3.6 Road rehabilitation, Koh Sampov Commune

Figure 8: Road in need of climate proofing



The road rehabilitation-cum-climate proofing has reduced the vulnerability to flooding for three villages in the commune, providing increased resilience and improved livelihoods for 996 households with a total population of 3,986, of which 50% female, through better adaptive capacity and access to public services such as health centers, commune services, and schools, as well as transportation of agriculture products to the market.

The number of indirect beneficiaries will be much higher, potentially around 13,000 people in Peam Chhor district that depend on cultivation for their livelihoods.

4 Lessons learned

Successful demonstration activities are characterized by:

- Support from intended beneficiaries and involved agencies, with a visible female participation.
- Clear social, environmental, and/or economic benefits achieved within a reasonable time scale - notably including livelihoods.
- Low risks in general and for involved households in particular.
- Realistic resource requirements, including capacity of implementing institutions and partners.

Initiatives that are strictly targeted at disaster risk reduction can be well justified from case to case. Initiatives that are narrowly focused on climate change adaptation should be considered with due caution unless they have visible side benefits in terms of resilient livelihoods and improved income generation, and/or reduced waste generation.

The initiatives should provide a convincing justification of the various suggestions and recommendations (including, but not limited to harmony with national policies), in order to mobilize support for their implementation, including external support and financing.

The success of a pilot and demonstration programme does not only rely on the number of households that benefit directly. The provision of highly visible and convincingly useful examples of good practices suited for emulation is also an overarching aim.

4.1 Observations from the CCCA activities

Section extracted from MoE (June 2016):

A Vulnerability Reduction Assessment (VRA) was conducted based on interviews with 248 households that had participated in various activities under the CARP and/or under the VAAP: Integrated farming systems (IFS) training and implementation; climate change and awareness training; livestock breeding and revolving livestock funds; rainwater harvesting; mangrove rehabilitation; and community fisheries. Of these households, 101 were headed by women, while 147 were headed by men. Information was obtained about climate-related and other vulnerabilities and constraints to livelihoods, and guidance was sought on the scope for consolidation and replication of the pilot and demonstration activities.

The households consistently expressed a high satisfaction with the achievements: 91% reported a significantly improved understanding of CC implications, and 87% reported a significantly improved flood and drought resilience. The large majority of participating households (93%) experienced significant benefits and highly appreciated the improvements to their livelihoods and income.

- IFS training was particularly well received with many suggestions on consolidation, expansion and replication.
- Access to water for households and for cultivation (by rainwater harvesting, household tanks, and village and household ponds) was highly beneficial.
- Savings groups and access to microcredit were also highly appreciated with a need indicated for additional capital.
- Many households expressed a need for access to technical support (possibly via extension services provided by the agricultural departments) in relation to pest and disease control for crops, livestock and poultry. This need is related to the new (and initially unfamiliar) production systems that were introduced beyond the traditional (and robust) rainfed paddy cultivation of one low-yield crop per year.

In general, there were no significant differences between the households led by women and the ones led by men.

Figure 9: A household pond used for growing vegetables



*Photo from Sameakki
Commune, Preah
Sihanouk Province,
February 2014*

The survey confirmed observations made during the programme implementation:

- It was clearly proven that climate change adaptation and rural livelihood improvements go hand-in-hand in that one effort can add substantial value to the other. Many adaptation options are related to livelihoods, and many of the options have benefits that extend beyond the direct scope of climate change adaptation.
- The applied multi-disciplinary approach was highly beneficial. Many benefits overlap between various sectors: Cultivation, livestock breeding, water resources, environment, disaster risk reduction, etc.

The households consistently reported high benefits provided by the various programme activities in terms of livelihoods and climate change resilience. Hereby, the survey clearly confirmed that climate change adaptation and rural livelihoods development can add substantial value to each other. Solid evidence of the achievable benefits was provided.

Figure 10: A community-based savings group



Mrs. Thorng Rath is the accountant for a savings group in Sameakki Commune, Prey Nob District - one of 25 such groups established under the VAAP, with a seed capital of 5.8 million riel. There are 28 members, who contribute 10,000 riel/month and receive a 0.8 %/month interest. Provided that funds are available, members can borrow for example 200,000 riel at a 1 %/month interest fee. Loans are used for investments in livestock, small household businesses, and medical treatment of sick household members. The demand of loans highly exceeds the available funds.

Source: CCCA (June 2014)

As mentioned above, the large majority of the participating households (93%) highly appreciated the significant benefits to their livelihoods and income that they experienced as a result of the activities.

It was found that even minor supplementary dry season cultivation (of crops other than the highly water-consuming rice) on small parcels of land and using water sparingly can improve household incomes significantly.

Several of the initiatives included new (and unfamiliar) seed varieties, cultivation modalities and livestock breeding. Full activation of the potential benefits can be supported by continued coaching and backstopping, and access to well-informed extension services.

4.2 Observations from the LGCC Project

Source: LGCC (March 2017)

The following observations were made during the pilot project implementation:

General

Structural and non-structural development initiatives can generate benefits in their own right, and can often add value to each other - one example being structural and non-structural flood protection.

Functional and climate-resilient roads can reduce the vulnerability to floods in different ways, including access to markets, schools and clinics.

Knowledge management and knowledge-sharing remain important objectives across sub-national CCA and DRR.

There is a clear scope for continued training and capacity-building, and for occasional amendments to procedures and modalities, incorporating lessons learned and reflecting new regulations and new financing opportunities.

Gender mainstreaming

Numerous studies by many organisations note the disproportionate impact of climate change on women (as well as the elderly, and other vulnerable groups). A gender-sensitive approach to CCA brings the planning and budgeting closer to those who need it, and to those who are directly able to respond to those needs. As a result, sub-national CCA initiatives will be able to more appropriately and effectively respond to the needs of women and other vulnerable groups, particularly as they will have direct access to the identification of needs (through assessment and planning processes), and thus more information for providing funds for gender-sensitive budgeting processes will be available.

One aspect of gender mainstreaming is to routinely and pro-actively collect information on the gender-sensitivity of the planning, budgeting and monitoring processes, the implementation of CCA activities, and the development of a monitoring mechanism that will ensure that participatory data collection approaches are used to facilitate and promote the participation of women and vulnerable groups.

Project quality indicators

In most cases, the districts were able to demonstrate satisfactorily that the selected projects responded to the identified priorities. The technical quality of the pilot projects assessed from field inspections was generally satisfactory although with a significant range in scores.

Sustainability was the weakest area. One district scored the maximum 20 points available for this indicator, but no other district scored more than 7/20 and three districts scored zero.

Process quality indicators

No district was able to complete the project preparation on time. (In part, this was due to late announcement and disbursement of the PBCRG allocations. Therefore, this sub-indicator was not fully under the control of the districts). However, it was decided to keep the indicator without modification rather than set a precedent of '*flexibility*' as this would lead to the performance assessment being less objective in the years to come.

All districts scored well on the procurement indicators (based on numbers of bids submitted and the size of price discounts obtained). This should not be taken as an indication that there were '*no problems*' with the procurement process, but based on the indicators that can be easily and objectively assessed, the performance was satisfactory.

The '*commitment and disbursement*' indicator showed considerable variation between the districts with the best performing district scoring almost 25/30 (83%). Some districts faced severe challenges in timely completion of the disbursements due to the need to wait until the wet season floods receded before commencing construction works.

The timeliness of project completion was measured relative to the planned contract completion dates (i.e. not tied to a calendar date as with the other 'timeliness' indicators). Again, a considerable variation in performance was observed with two districts achieving the maximum of 20 points on this sub-indicator while three districts failed to complete any projects on time.

Beneficiaries' indicators

The districts scored well on the measure of cost-effective support to poor and vulnerable beneficiaries with four districts scoring the maximum of 20 points on this indicator and the lowest score being 14/20. The scores derived from the participatory evaluations were also high with an average of 74/80 being awarded. It was noted that beneficiary groups tended to be generous in their assessment of the value and climate-adaptive relevance of projects. The participatory evaluation is necessarily more subjective than the other indicators. Further development of the methodology should aim to make the assessment more rigorous while ensuring that it continues to reflect the views of the beneficiaries and not those of the assessment team.

Sub-national Climate Change Mainstreaming Index

The average score achieved for climate change mainstreaming in sub-national planning was 14/25. One district failed to score any points for this sub-index due to having lost all relevant documentation. The highest score obtained was a satisfactory 20/25.

Scores for institutional capacity and coordination were generally satisfactory, with one district achieving the maximum of 25 points while the lowest score was 12.

As expected, the districts made rather limited use of available climate information at the current time, so scores for this sub-index were low with the average being only just above 20% of the available points. One district scored 17/25 but no other district scored higher than 6/25.

The scores awarded for '*climate change integration into financing*' were high: an average of 21/25. This is surprising; when the index was designed it was assumed that initial scores would be very low in this area. It is possible that the indicators were misunderstood, leading to over-generous marking.

4.3 CamboWP observations

Source: CamboWP (January 2017)

The following observations were made by CamboWP during the 2016-17 study under the Water, Climate and Development Programme (WACDEP):

- Aim at producing some tangible and useful outputs in the short term.
- Support basinwide, real-time data management (flood levels, storage volumes, forest fires, etc).
- Maintain outreach to decision-makers involved in development planning at the national, province, district and commune level, including clear and concise policy briefs.
- Make action-oriented and practical suggestions and recommendations that are clearly oriented towards a specific agency or other body.
- Prefer de-central decision-making, where this is reasonable considering the scale of the decision, and subject to practical (capacity and knowledge-base) constraints.
- A '*fast track*' can be provided for uncontroversial priority initiatives (in order to demonstrate progress and gain momentum, and to assure that the framework does not, against its purpose, delay the implementation of useful developments).

Figure 11: Consultation workshop in Kratie (November 2016)



4.4 Observations from the NCDDS Pilot Projects

It is expected that the benefits of the pilot projects will reach well beyond CC adaptation and disaster risk preparedness, for example by supporting livelihoods and income generation, and the general substantial social and economic benefits of improved connectivity. The sustainability can be supported by the continued active participation by the local communities in operation and maintenance, and the replicability can be demonstrated by disseminating the activities as *'success stories'* at upcoming seminars and on the internet.

Relevance

All the four pilot initiatives were highly relevant. The elaborate, participatory procedure for the identification and scoping was helpful in this connection, with support from local administrations and communities considered as a key selection criterion.

Effectiveness

The projects were fully integrated in the local, existing infrastructure, without any adverse social or environmental implications.

The long-term benefits can be increased by related (non-structural) initiatives, such as awareness-building (including knowledge-sharing) about water and energy efficiencies; and climate-resilient (notably drought-tolerant) cultivation and livestock breeding; and soil management; as well as promotion of tree planting and vegetation cover maintenance.

Cost efficiency

The implementation of the pilot projects was highly facilitated by the related, comprehensive experience of NCDDS.

No detailed cost-benefit analysis has been conducted for the four pilot projects, but it is evaluated that their cost efficiency is fully satisfactory.

Sustainability

Community-based management and maintenance committees were established in connection with each pilot project, and initial training provided. Given the significant benefits of community-based operation and maintenance, a scope is seen for continued coaching and backstopping for the committees, and for access to extension services provided by the districts or provinces.

As demonstrated by the NCDDS pilot projects, the long-term sustainability of water-related structural interventions can be enhanced by appropriate bank erosion protection/risk reduction, and by scour protection (around culverts) where this is relevant. Such measures may increase the costs *'up front'* but can extend the lifetime of the project significantly.

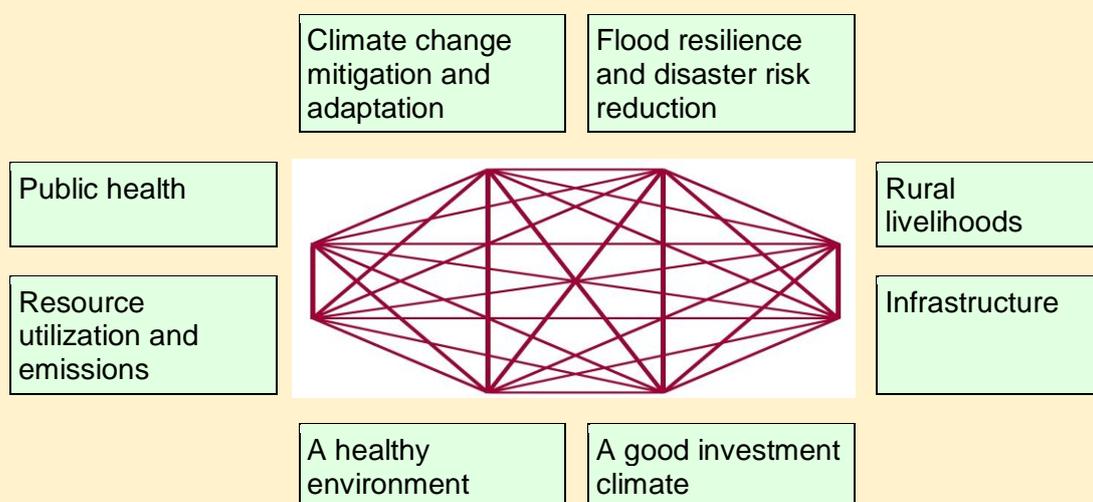
5 Good practices for sub-national CCA mainstreaming

The sub-national (province, district and commune) level is an important platform for CCA and DRR, reaching down to the community and household levels, and feeding relevance into national policies and strategic planning. Hereby, the different levels must interact to converge towards continuously expanded benefits.

5.1 The multiple benefits of CCA and DRR

Most CCA and DRR initiatives have substantial benefits that extend well beyond reduced vulnerability and improved preparedness towards climate-related pressures. This is important, given the prevailing uncertainties about exactly how the climate is going to change. The figure below shows a network of potential development synergies that, from case to case, may add value to specific climate-oriented initiatives.

Figure 12: Potential development synergies (in random order)



Climate change mitigation and adaptation include tree planting and improved production efficiencies (energy, water, etc.) and reduced waste generation.

Flood resilience and disaster risk reduction include floods, land slides, drought, forest fires, and contingency planning and preparedness, interacting with land use planning.

Public health includes safe water for households, maternal health, and control of water-related diseases.

Rural livelihoods include improved income generation, improved and/or supplementary cultivation and livestock breeding, dry season cultivation, soil management, access to markets, extension services, and functional value chains unaffected by oligopolies.

Resource utilization and emissions include water and energy efficiencies, use of fertilizers and pesticides, and sewage and solid waste generation and disposal.

Infrastructure includes roads, waterways, and supplies of water and electricity.

A healthy environment covers sustainable forestry, healthy headwater areas and active flood plains, wetlands, and aquatic habitats and ecosystems.

A good investment climate covers predictable and transparent regulation of resource utilization and emissions, orderly enforcement, EIA and CC screening implementation, and low CC-related risks.

As one example, tree planting, forest conservation and headwater restoration provide a broad range of economic, social and environmental benefits, reaching across CC adaptation and mitigation, while reducing exposures and vulnerabilities.

9 July – arbor day

Back in 1901, Cambodia's king Norodom encouraged all farmers to plant a few sugar palms on their land, to provide a dry season livelihood that is complementary to the traditional rainfed paddy cultivation. Apart from sugar and fruits, the trees provide leaves for thatch, as well as timber and firewood.

In 1952, 9 July was instituted as 'arbor day' by the late king Sihanouk, to raise awareness of the significant multiple benefits of healthy trees and forests.

On 9 July 2019, king Norodom Sihamoni attended a tree-planting ceremony in Kratie, one of several such events held each year across the country.

The king recommended the people to plant trees in public areas and on their farmland, and join together to prevent deforestation and environmental degradation, noting that forests contribute significantly to the economy, culture, tourism and social wellbeing, while loss of forests would cause flooding, drought and soil degradation, and loss of income for the villagers. He also called on monks, the local authorities and the general public to plant trees, including palm trees, in public spaces, pagodas, villages and farms, and alongside streets, national roads and canals. Trees offer shade for people and animals, provide timber, and improve the resilience to climate change.

On the same day, the prime minister posted a Facebook message, urging all Cambodians to instill in one another the love of trees and to plant them where possible. He expressed his appreciation of the efforts by national and sub-national administrations, as well as donors and development partners, to protect the environment and support planting more trees across the kingdom.

Source: Phnom Penh Post 10 July 2019

5.2 Lessons learned from the pilot projects

The lessons learned are quite consistent and may be summarised as follows:

- Strive for harmony between applicable national and sub-national development policies and preferences.
- Apply a long-term vision but a reasonable time scale for implementation (perhaps up to 2-3 years).
- Promote revenue generation, cost recovery and sponsorships, in pursuit of financial sustainability.
- Promote improved water efficiencies, improved energy efficiencies and reduced waste generation at the household and community levels and at irrigation schemes and industries.
- Note and exploit the powerful long-term synergies between economic growth, natural resource management and environmental management. Promote sustainable and transparent resource utilization - water, hydropower, forests, minerals, habitats, etc.

- Apply livelihood generation as a progress indicator in its own right (along with national economic growth, safe water and sanitation, poverty alleviation, etc.). Pay particular attention to rural livelihoods.
- Prefer small steps to big ones whenever the choice is available. There is always a risk of unexpected side effects.
- Involve the private sector with its powerful development agenda and potential. Apply light-touch regulation to achieve a balance between immediate and long-term goals, and between private and public development priorities.
- Note the strong links between water resource management and land management. Promote zoning of land-use with a view to land ownership, land-use potential, soil quality, access to water, habitat conservation, flood risk, pollution, and infrastructure.
- Consider the potential for development of tourism and recreation.
- Do not rely on perfect knowledge about the future. Base decisions on the '*best available knowledge at the time when the decision must be made*'. This may involve the concept of 'Total Economic Value' across economic, social and environmental benefits.

The particular links between CCA, DRR and (urban and rural) land use were demonstrated during the PPCR Phase 1 (2009-13) and were clearly confirmed by the CCCA pilot activities, see below.

Examples of good practices for climate-resilient land use

- Distinguish clearly between *urban, rural, industrial and conservation zones*, and between *floodplains and sloping areas*.
- Maintain *gentle restrictions* on land use along the coast, along rivers and streams, and in drainage basins upstream of reservoirs.
- Caution is required for development (including reclamation) of *active floodplains*.
- Promote *climate screening*, on a routine basis, of infrastructural developments and other development initiatives that may be affected by climate change and/or may generate climate-related impacts (or opportunities) on adjacent areas or facilities.
- Avoid sensitive developments in *high-risk zones* (for example location of clinics and schools in flood-prone areas).
- Avoid settlements in areas with a *risk of land slides*.
- Preserve/restore a healthy vegetation cover on *idle lands and in headwater areas*.
- Pay attention to particular '*assets*' (of a particular cultural and/or socio-economic and/or environmental significance) (actual or potential).
- Promote *open access to information* about land ownership and land concessions.

Source: CCCA (October 2015)

5.3 Golden rules for strategic flood risk management

Sayers, Paul and others (April 2013) have compiled the following 'golden rules' for strategic flood risk management:

1. Accept that absolute protection is not possible and plan for accidents. Design standards, however high they are set, will be exceeded. Structures may fail (breach, fail to close and so on), and early warning systems or evacuation plans may not work as expected. Accepting that some degree of failure is almost inevitable, and this places a focus on enhancing resilience.
2. Promote some flooding as desirable. Floods and floodplains provide fertile agricultural land and promote a variety of ecosystem services. Making room for water maintains vital ecosystems and reduces the chance of flooding elsewhere.
3. Base decisions on an understanding of risk and uncertainty. An explicit trade-off between the risks reduced, opportunities promoted and the resources required to achieve them is central to FRM. The uncertainty within the data and models must be explicitly acknowledged.
4. Recognize that the future will be different from the past. Future change (climate, societal, structural condition and of other kinds) can profoundly influence flood risk. Developing adaptive strategies enable flood risk managers to respond to the reality of the future as it unfolds, minimizing regret, in a purposeful and planned way.
5. Implement a portfolio of responses, and do not rely on a single measure. Integrated management involves consideration of the widest possible set of actions. This includes measures to reduce the probability and measures to reduce the consequences (exposure and vulnerability) of flooding.
6. Utilize limited resources efficiently and fairly to reduce risk. The resources used must be related to the risk reduced and the ecosystem, economic and social opportunities promoted. Universal or generalized engineering standards of protection should not be used.
7. Be clear on responsibilities for governance and action. Governments, businesses, communities and individuals must be active participants – all sharing responsibility and contributing fiscal support within a clear framework of collaboration.
8. Communicate risk and uncertainty effectively and widely. Effective communication of risk enables better preparation and helps ensure support to mitigation measures where necessary. Communicating the risk after a catastrophe is too late.
9. Reflect the local context and integrate flood planning with other planning processes. The preferred strategy for a given location will reflect the specific risks faced (and not arbitrary levels of protection that should be achieved).

5.4 Private sector involvement

Section extracted from NCDDS (July 2018) and MoE and MoP (April 2013a)

Cambodia has a vibrant and entrepreneurial private sector that is a visible driver of national development. Still, climate-related policy formulation and planning take place without much interaction with the private sector. ¹

¹ PPCR, Phase 1, Component 3 addresses the role of the private sector in climate resilience and disaster risk reduction

The private sector provides products and services, with an agenda that is complementary to that of the public sector. It has its own (profit-oriented) development agenda, typically (but not always) with a shorter time horizon than the national development agenda, and its own particular sources of financing.

There are many examples of overlaps of interest between the state and the private sector, for example related to reducing the investment risk:

- Protection against disasters (or good knowledge about the risks);
- access to, and sustainable use of various resources (land, water, energy, ...);
- access to trustworthy certification of sustainable hardwood timber production (which would highly expand the generated revenues);
- orderly waste disposal; and
- transparent and predictable environmental regulation and land use regulation.

From case to case, the private sector can sponsor various CC adaptation initiatives, as it is seen in Cambodia, Thailand, and elsewhere. Examples include large-scale cultivation, sometimes introducing new technology, and hydropower production. It could potentially contribute to improved climate resilience via improved water (and land) efficiencies of production systems; reduced consumption of water and energy, and reduced waste production. Also, the private sector might find an interest in giving a hand with awareness-building and social marketing of good practices. Another potential participation is sponsorships of 'beautification projects' and forest restoration schemes.

5.5 University syllabus for CCA and DRR

Cambodia's university community is steadily evolving, supporting the country's transition into a lower middle-income country. As yet, however, there are no targeted BSc and MSc courses covering climate change implications. The need of such education seems to be evident, given the national vulnerability to climate change. There are many skilled practitioners, both in the public and the private sector, but the demand highly exceeds the supply.

University education could involve natural science disciplines and managerial/governance (business management) disciplines, possibly separately. Teachers and last-year students could be invited to participate in the implementation of pilot and demonstration activities and related vulnerability reduction assessments.

This would be a long-term measure, but with potential high benefits.

6 Supportive governance

Governance is at the core of Cambodia's Rectangular Strategy. Good governance is rightly seen as the over-all key to national health and prosperity and is being promoted via the National Strategic Development Plans (NSDPs), with a view to applicable sustainable development goals: ²

- SDG 2 Zero hunger
- SDG 4 Quality education
- SDG 5 Gender equality
- SDG 6 Clean water and sanitation
- SDG 7 Affordable and clean energy
- SDG 8 Decent work and economic growth
- SDG 10 Reduced inequalities
- SDG 11 Sustainable cities and communities
- SDG 13 Climate action
- SDG 14 Life below water
- SDG 15 Life on land
- SDG 16 Peace, justice and strong institutions
- SDG 17 Partnerships for the goals

Governance of climate resilience and disaster risk reduction was initially promoted by the inter-ministerial National Climate Change Committee (NCCC), today incorporated in the National Council for Sustainable Development, with secretariat services provided by MoE.

Additional support is provided by various national, regional and international initiatives and collaborations.

Any support to governance and leadership is likely to be clearly beneficial.

6.1 Institutional capacity

In relation to CR/DRR, '*institutional capacity*' is taken as the skills, tools and other resources available to an organization to undertake its responsibilities in general or a specific task in particular. This includes:³

- Staffing; human skills;
- availability of relevant data and information, including maps and weather data;
- facilities (such as computer hardware and software, transport, equipment for monitoring and analysis);
- tools: Guidelines; decision-support tools;

² See Appendix B.9: Cambodia's implementation of Sustainable Development Goals

³ Other characteristics, not included in this list, are formal mandate; informal recognition; leadership; operational and procedural modalities; and attitudes to service/ innovation

- financial resources: (1) for routine operation and maintenance; and (2), for implementation of development initiatives according to plans;
- networking modalities (for dialogue with other management levels and with other agencies at the same level); and
- relations with (1) the service users; (2) the private sector; and (3) other stakeholders.

Institutional capacity-building is among the '*low-hanging fruit*' that can support the over-all national development in general, as well as CR and DRR in particular.

6.2 Integrated management

Integrated management

- ... applies a holistic approach, spanning across disciplines, sectors and agencies, and (from case to case) administrative boundaries;
- ... is a valuable supplement to (rather than a replacement of) traditional sector planning;
- ... is based on comprehensive stakeholder involvement, which enhances the relevance and usefulness of the planning and the prospects for implementation;
- ... is oriented towards the triple bottom line of social, economic and environmental benefits.

Disaster risk reduction and (particularly) climate resilience span across sectors. Developments in one sector (for example hydropower) can impose new opportunities in other sectors (for example irrigated agriculture), or, in some cases, new constraints. Timely identification and due attention to such inter-dependencies can add value beyond the direct value of the planned development. The feasibility of a new hydropower scheme can improve if external benefits are considered - such as dry season flows for cultivation and salinity control; and/or flood mitigation.

One way to highlight inter-sector implications could be a joint screening for environmental and climate-related impacts, as outlined in Section 5.6 below.

Climate resilience (CR)⁴

Mainstreaming of climate resilience takes place on a background of

- attractive opportunities to combine the climate perspective with important over-all social, economic and environmental benefits;
- inadequate data and knowledge, including inherent quantitative uncertainties regarding the future climate; and
- visible inter-sector (and inter-agency) dependencies and synergies.

Between them, these considerations indicate a strong preference for '*multiple benefits solutions*' (see Section 4.1). There are few options, if any, for development initiatives that are justified *only* for the sake of climate resilience; but many options that will support climate resilience while, at the same time, providing significant benefits in their own right.

4 This and the following sections extracted from MoE and MoP (April 2013a)

Disaster risk reduction (DRR)

In comparison, mainstreaming of disaster risk reduction

- can often be justified in its own right;
- may take place mainly within one sector (although potential inter-sector synergies remain and should be duly observed); and
- can be planned on a basis of fair knowledge about feasibility, cost and benefits.

Tentative guiding principles

Some suggestions are listed below.

Tentative guiding principles for CR and DRR

- Invest in human capital, develop competent and flexible institutions, focus on weather resilience and adaptive capacity, and tackle the root causes of poverty.
- Eliminating poverty is central to both development and adaptation, since poverty exacerbates vulnerability to weather variability as well as climate change.
- Do not rush into making long-lived investments in adaptation unless these are robust to a wide range of climate outcomes or until the range of uncertainty about future weather variability and climate has narrowed. Start with multiple-benefits options.
- Beware of creating incentives that encourage development in locations exposed to severe weather risk. Beware of expanding urbanization into flood plains or coastal zones that are exposed to sea level rise, storm surges or land subsidence.
- Hard and soft approaches to adaptation add value to each other. Good policies, planning and institutions are essential to ensure that more capital-intensive measures are used in the right circumstances and yield the expected benefits.

'*Multiple benefits solutions*' are those which are feasible and beneficial even if the climate does not change as expected (or does not change at all, for that sake). They are attractive in a context where action is required, but set against a background of incomplete financial resources and uncertainty about exactly how the climate will change in the time to come.

One main perspective in this connection is *the efficiency of water-related production systems* in support of sustainable livelihoods, resilient households, and added value of water utilization. Any improvements in this regard will have definite social and economic benefits.

There are many other examples, such as

- reduction of existing flood exposure and vulnerability;
- improved drought resilience (including increased storage capacity and contingency planning);
- improved urban drainage;

- improved groundwater management;
- institutional strengthening; and
- research, monitoring, knowledge-sharing and dialogue.

It is important to plan for the right combination of CCA/DRR measures:

- *Proactive and reactive measures:* Reactive measures will be the dominant response until threats become better understood. On the other hand, many climate-related threats (such as floods and drought) are well-known enemies, and many decisions can be safely based on current knowledge.
- *Soft and hard measures:* Many soft measures - such as water and energy pricing, strengthening property rights, and flood plain and landslide area zoning - have robust adaptation and development results; but they take time and require strong institutions to put in place.
- *Public and private adaptation:* Adaptation measures can be classified by the types of economic agent initiating the measure - public or private. The literature distinguishes between autonomous or spontaneous adaptation (by households and communities acting on their own without public interventions but within an existing public policy framework) and planned adaptation (from a deliberate public policy decision).

6.3 A 'top-down' and a 'bottom-up' approach

A distinction can be made between two ways to CC mainstreaming, as indicated below.

This is not a matter of either-or, however. The two ways are complementary. They can supplement and add momentum to each other.

The 'top-down' approach

This approach takes its starting point in the national development policies, strategies and planning for climate-related implications, land use, environmental governance, and social and economic development in general (such as the Cambodia Climate Change Strategic Plan 2014-2023, see Appendix B.6). It assures consistent, transparent and predictable governance (in support of many good purposes, including a healthy investment climate).

Expectedly, some institutional implications need to be sorted out, given the steadily evolving agenda, and a bit of inter-agency networking and capacity-building must be provided, with support from bodies such as the National Council for Sustainable Development, the National Committee for Sub-National Democratic Development (NCDDS) and the National Committee for Disaster Management (NCDM).⁵

The 'bottom-up' approach

Indispensable location-specific insight, and knowledge about development concerns and opportunities, are available at the sub-national levels of administration, interacting with the community and household levels.

The '*bottom-up*' approach involves the project and programme levels of the development planning hierarchy. It involves climate screening and climate proofing of single projects

⁵ In due time, the networking may be extended to include the National Commission to Prevent and Suppress Natural Resources Offences (established in December 2016)

(perhaps coordinated with EIAs where these are relevant), or entities of projects (with a view to cumulative implications), or entire investment programmes.

The benefits include timely identification and appropriate response to CR-related pressures and opportunities, and to climate-related disaster risk implications - just like an EIA aims at timely identification and appropriate response to adverse social and environmental implications.

5.4 Decentralization, deconcentration and community participation

Section modified after MoE and MoP (April 2013a)

Decentralization and deconcentration have been government policy since the first commune-level development plans were prepared with support by the Seila project for 2003-2007. The planning is now aligned with the mandate of the elected commune councils, but is impeded by sparse capacity and finite public funds available for implementation.

The National Program for Sub-National Democratic Development (NP-SNDD) was launched in 2010.

Today's commune- and district-level budgets (of around 35,000 USD per year on the average) can cover urgent infrastructural maintenance only – there is no scope for proactive development unless specific financing can be obtained under the various development programmes. Various targeted CCA financing options are available, however, but the needs exceed the availability.⁶

Substantial budget allocations have been announced for the years to come. In February 2019, the Minister of Interior announced that the commune development budgets will more than double, to around 73,000 USD, in 2020, with subsequent gradual increases up to 110,000 USD in 2023. He explained that these upgrades had already been approved by the Prime Minister and by MEF.⁷

At the province level, a state of transition is in progress towards larger responsibilities being allocated within the ministries from the national departments in Phnom Penh to the provincial departments. At the same time, tasks (for example related to servicing the communes) are gradually being shifted from the provincial departments of the ministries to the town hall administrations of the provincial governors. Both processes are in an early stage and may continue for quite some time. There are visible differences from one province to another.

The decentralization and deconcentration process has strong political support from the highest level. At the 41st Congress of the ruling Cambodian People's Party in December 2018, the Prime Minister emphasised that the process must be completed by 2020.⁸

6 See NCDDS (November 2017) (KP-4)

7 See NCDDS (July 2018) (KP-5)

8 Quoted in Phnom Penh Post on 24 December 2018

6.5 Responsive and pro-active interventions

Rahardjanto (July 2011) makes a conceptual distinction between:

- '*Responsive*' interventions, oriented towards threats and concerns, or control of something undesired, on the one hand, and
- '*Pro-active*' interventions, oriented towards opportunities, or achievement of something desired, on the other.

The distinction is summarized in the following matrix of approaches, which illustrates that both are useful and well suited to complement each other.

Table 2: Responsive versus pro-active preparedness and adaptation

	Responsive: Oriented towards threats	Pro-active: Oriented towards opportunities
General: Broad area coverage (for example the whole state); perhaps inter-sector/multi-disciplinary	Examples: Weather forecasting, guidelines (for design, construction and operation), contingency planning for various calamities, general disaster mitigation preparedness and capacity	Examples: Promotion (social marketing) of good practices (for example waste disposal, and use of water, energy and pesticides), agricultural research and services, research and education
Specific: Delineated area (for example a river basin); and a clear sector perspective	Examples: Reduction of exposure: Reservoirs, structural flood protection, drainage capacity, subsidence control, disaster mitigation	Examples: Reduction of vulnerability: Land use planning, sustainable utilization of aquatic habitats and forests, pilot and demonstration activities in support of higher efficiencies of production systems

The matrix does not provide sharp delineations - there are overlaps and interactions between the categories. It is not suited for ranking of measures - all categories can be valuable, or indeed '*best choices*', as the case requires. Its purpose is merely to highlight the potential synergies between preparedness and adaptation initiatives.

Experience indicates that many stakeholders are well aware of climate-related pressures but less well aware of the mitigation opportunities. This is important, because most development initiatives tend to be '*responsive*' rather than '*pro-active*'.

6.6 EIA and climate screening

Many development interventions require an orderly environmental impacts assessment (EIA). The EIA covers air and water emissions, solid waste production and land use. It is prepared by the developer (or often by a consultant employed by the developer) and is reviewed and approved by MOE's EIA Department.

An Environmental Impact Assessment Department was established in MoE back in 1997. In 1999, guidance on the required EIA process was provided by Sub-decree No. 72 on Environmental Impact Assessment Process. In September 2009, a Prakas was issued with '*General Guidelines for Preparing Initial Environmental Impact Assessment and Full Environmental Impact Assessment Reports*'.

In 2012 the government began work on drafting an Environmental Impact Assessment Law that would update and develop the 1999 sub-decree. In 2015, the government decided to take a much more ambitious step forward and develop an Environment and Natural Resources Code for Cambodia. This code is now in its 11th draft. There have been many rounds of consultations at both the national and subnational level. The new draft revises the Ministry of Environment's authority and the overall review obligations into a more manageable process. It contains provisions that are intended to expand access to environmental information for the public generally, including access to EIA documents.⁹

In this connection, a provision might be considered to extend the EIA screening with a '*climate screening*' (of climate-related cause-effect relationships, opportunities and threats at the project level). Several, but far from all adverse environmental impacts are also climate-related; while positive opportunities could pass below the radar. Such a screening might provide benefits both for the developer and for the surrounding society. The modalities should be manageable and transparent, perhaps including check lists, and avoiding '*red tape*' that would affect a healthy investment climate. In due time, the screenings may be conducted via an Internet portal, which would support consistency and transparency, and reduce to required workload.

7 Conclusion

Between them, the various recent pilot and demonstration projects (by NCDDS and several other operators) clearly confirm the inter-dependency and positive interaction between climate change adaptation, disaster risk reduction, sustainable livelihoods and improved incomes, public health, reduced waste generation and appropriate waste disposal, and a healthy environment.

Sub-national climate change and disaster resilience can be improved by measures such as the following:

- Access to safe water, sanitation and electricity.
- Improved, reliable water availability for cultivation: Irrigation infrastructure supported by adequate storage capacity and appropriate (community-based?) operation and maintenance, and capacity-building of scheme operators.
- Flood protection (structural and non-structural), and drought preparedness and mitigation based on contingency plans.
- Improved, responsive extension services, supported by national knowledge-sharing and networking, '*learning from each other*', possibly including occasional thematic seminars.
- Improved land use planning.

⁹ Source: The Open Development Cambodia (ODC) website, www.opendevdevelopmentcambodia.net, accessed in July 2019

- Reduced generation and orderly disposal of solid waste and wastewater.
- Knowledge base development – an objective in its own right, in support of timely and well-informed decision-making, identification and scoping of potential development initiatives (and other investments), design optimization, and analyses of risks, costs, benefits and (positive and adverse) impacts. This includes dissemination of ‘*success stories*’ suited for replication.
- Public awareness of ‘*good practices*’: Public health, water and energy utilization, use of fertilizers and pesticides, and timely and orderly response to adverse events

Successful achievements are supported by active participation by involved communities and institutional stakeholders (including the implementing SNAs), as well as the private sector and the academic community, as appropriate in the context.

There is a clear scope for continued and expanded liaison, knowledge-sharing and active collaboration, ‘*horizontally*’ (between sectors and administrative bodies at each level) as well as ‘*vertically*’ extending all the way from the national government to the provinces, districts and communes, down to the community and household level. This includes continued support to coordination bodies, such as the National Committee for Disaster Management (NCDM) and its sub-national bodies, and the National Council for Sustainable Development (NCSD).

References and literature

Most documents are available from the Internet, and all documents are available with the NCDDS TA team.

An asterix () indicates that an abstract is provided in Annex B.*

ADB (May 2014): Kingdom of Cambodia: Strengthening coordination for management of disasters. Capacity Development Technical Assistance Report, Project No. 46230, financed by the Japan Fund for Poverty Reduction

Bertule, M., Bjørnsen, P. K., Costanzo, S. D., Escurra, J., Freeman, S., Gallagher, L., Kelsey, R. H. and Vollmer, D. (October 2017): Using indicators for improved water resources management - guide for basin managers and practitioners. ISBN 978-87-90634-05-6 *

CamboWP (January 2017): Situation analysis and outline of a water security framework. Concept Paper prepared by Cambodia Water Partnership under the Water, Climate and Development Programme (WACDEP)

Carvalho, Annaka Peterson (October 2011): Women, gender and climate change. Slide presentation at the 2nd National Forum on Climate Change, Cambodia

CCCA (July 2012): Vulnerability of existing agricultural practices. Prepared under the Coastal Adaptation and Resilience Planning (CARP) Component of Cambodia Climate Change Alliance

CCCA (October 2012): Assessment of community vulnerability and risks from climate change in the coastal zone of Cambodia. Prepared under the Coastal Adaptation and Resilience Planning (CARP) Component of Cambodia Climate Change Alliance

CCCA (March 2013): Climate-resilient irrigation. Guidance paper prepared under the Coastal Adaptation and Resilience Planning (CARP) Component, Cambodia Climate Change Alliance *

- CCCA (January 2014): Effective mechanisms for climate change mainstreaming in sub-national planning. Prepared under the Coastal Adaptation and Resilience Planning (CARP) Component of Cambodia Climate Change Alliance
- CCCA (June 2014): Lessons learned from pilot and demonstration activities. Prepared under the Coastal Adaptation and Resilience Planning (CARP) Component of Cambodia Climate Change Alliance
- CCCA (July 2016): Promoting private sector contribution to the climate change response in Cambodia. Prepared for Cambodia Climate Change Alliance by the General Secretariat of the National Council for Sustainable Development
- CPEIR (July 2012): Cambodia Climate Public Expenditure and Institutional Review. Prepared for Ministry of Environment and Ministry of Economy and Finance by the Overseas Development Institute with support from Cambodia Climate Change Alliance
- GCCC (March 2018): Mainstreaming gender into adaptation investments - guidance manual for policy makers and practitioners. Prepared under TA8179, Package C, '*Gender, monitoring and evaluation, and mainstreaming at the sub-national levels*', by the Gender and Climate Change Committee, Ministry of Women's Affairs
- Dinshaw, Ayesha and Colleen McGinn (June 2019): Assessing the effectiveness of climate resilience grants to local governments in least developed countries. Working paper published by World Resources Institute, Washington, DC *
- Elliott, Cynthia, Jesse Worker, Kelly Levin and Katherine Ross (June 2019): Good governance for long-term low-emissions development strategies. Working paper published by World Resources Institute, Washington, DC *
- Heikens, Alex (October 2011): Barriers and opportunities for effective adaptation. Slide presentation at the 2nd National Forum on Climate Change, Cambodia
- Hou Taing Eng (March 2016): Country Report on Cambodia's disaster risk reduction. Slide presentation at the Regional Capacity Development Workshop: Mainstreaming DRR in Sustainable Development Planning, March 13-16, 2016, New Delhi
- IFC (May 2007): Stakeholder engagement: A good practice handbook for companies doing business in emerging markets. International Finance Corporation, Washington, D.C. *
- IPCC (2014): Climate change 2014: Impacts, adaptation, and vulnerability, Part A: Global and sectoral aspects. Working Group II contribution to the 5th Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press
- IUCN (April 2014): A guiding toolkit for increasing climate change resilience
- Kim Sour, Chem Phalla, So Sovannarith, Kim Sean Somatra and Pech Sokhem (August 2014): Methods and tools applied for climate change vulnerability and adaptation assessment in Cambodia's Tonle Sap Basin. CDRI Working Paper Series No. 97, Cambodia Development Resource Institute
- Leng Heng An (February 2014): Disaster management - country report of Cambodia. Asian Disaster Reduction Center (ADRC), Kobe, Japan
- LGCC (March 2017): Annual report - 2016. Prepared by NCCDS under the Local Government and Climate Change project
- MoE (October 2006): National Adaptation Programme of Action to Climate Change (NAPA). Prepared by Ministry of Environment for the Royal Government of Cambodia
- MoE (October 2015): Climate change and environmental aspects of land use in the coastal provinces. Training manual prepared under the Vulnerability Assessment and Adaptation Programme for Climate Change within the Coastal Zone of Cambodia Considering Livelihood Improvement and Ecosystems

- MoE (June 2016): Vulnerability reduction assessment (VRA). Report prepared under the Vulnerability Assessment and Adaptation Programme for Climate Change within the Coastal Zone of Cambodia
- MoE (May 2017a): Capacity-building tools. Review report prepared under the Generating, Accessing and Using Information and Knowledge Related to the Three Rio Conventions project
- MoE (May 2017b): Capacity-building needs and options. Review report prepared under the Generating, Accessing and Using Information and Knowledge Related to the Three Rio Conventions project
- MoE and MEF (April 2013): Guidance on mainstreaming climate resilience and disaster risk reduction into national investment planning. Guidance paper prepared by DHI in association with NIRAS under PPCR Phase 1, Components 1: Mainstreaming climate resilience into development planning at the national level *
- MoE and MoI (January 2013): Guidance on mainstreaming climate resilience and disaster risk reduction into sub-national development and investment planning. Guidance paper prepared by DHI in association with NIRAS under PPCR Phase 1, Component 2: Mainstreaming climate resilience into development planning at the sub-national level
- MoE and MoP (April 2013a): Climate change implications for national planning. Discussion paper prepared by DHI in association with NIRAS under PPCR Phase 1, Component 1: Mainstreaming climate resilience into development planning at the national level
- MoE and MoP (April 2013b): Guidance on mainstreaming climate resilience and disaster risk reduction into national development planning. Guidance paper prepared by DHI in association with NIRAS under PPCR Phase 1, Component 1: Mainstreaming climate resilience into development planning at the national level
- MoH (October 2011): Climate change and health. Slide presentation by Preventive Medicine Department, Ministry of Health, at the 2nd National Forum on Climate Change, Cambodia
- MoI and MoP (March 2017a): Guideline on the preparation of commune/sangkat development plans (in Khmer)
- MoI and MoP (March 2017b): Guideline on the preparation of commune/sangkat investment programmes (in Khmer)
- MoI and MoP (March 2017c): Guideline on the preparation of district development plans (in Khmer)
- MoI and MoP (March 2017d): Guideline on the preparation of district investment programmes (in Khmer)
- MOWRAM (February 2015): Report on institutional arrangements for the management of water resources in Cambodia. Prepared for Ministry of Water Resources and Meteorology under the Water Resources Management Sector Development Program (ADB TA 7610) by EgisEau in association with KeyConsultants (Cambodia) Ltd. *
- MRC (September 2009b): Adaptation to climate change in the countries of the Lower Mekong Basin: Regional synthesis report. MRC Technical Paper No. 24
- MRC (June 2010): Impacts of climate change and development on Mekong flow regimes - First assessment - 2009. MRC Technical Paper No. 29
- MRC (February 2011): Impacts of climate change and development on Mekong flow regimes: First assessment – 2009. MRC Management Information Booklet Series No. 4

- NCDD (April 2017): Integrating socially inclusive CC adaptation into the commune development planning and the commune 3-year rolling investment programme process. Supportive document prepared by the National Committee for Sub-National Democratic Development for the Royal Government of Cambodia
- NCDDS (September 2016): Implementation and procurement handbook for construction/rehabilitation of the district disaster risk reduction and climate change adaptation small scale infrastructure project. Prepared under the Community-Based Disaster Risk Reduction Project (CDRR), Component C (ADB TA 9178-CAM)
- NCDDS (September 2017): Mainstreaming climate resilience in provincial, district, and commune development and investment plans. Knowledge product KP-1 prepared under TA8179, Package C
- NCDDS (November 2017, revised July 2018): Innovative financing schemes for mainstreaming climate resilience at provincial, district and commune levels. Knowledge product KP-4 prepared under TA8179, Package C
- NCDDS (July 2018): Barriers and opportunities for climate change adaptation and disaster risk reduction at the district and commune levels. Knowledge product KP-5 prepared under TA8179, Package C
- NCDDS (August 2018): Manual for performance based grants to sub-national administrations. Prepared under the LGCC project
- NCDDS (September 2018): Performance assessment manual. Prepared under the LGCC project
- NCDDS (November 2019): Pilot project implementation. Progress report prepared under TA8179, Package C, *'Gender, monitoring and evaluation, and mainstreaming at the sub-national levels'*
- NCSD (November 2015): Cambodia's second national communication submitted under the UN Framework Convention on Climate Change. National Council for Sustainable Development, Kingdom of Cambodia
- OECD (November 2009): OECD policy guidance on integrating climate change adaptation into development co-operation
- Ou Sivhuoch and Chheat Sreang (September 2015): Analysis of Cambodia's preparedness for the implementation of Sustainable Development Goals: Challenges, opportunities and financing. Partnerships for Sustainable Development in Cambodia *
- Rahardjanto (March 2011): Climate change: The basin-level perspective. International Seminar on Climate Change: Environment Insight for Climate Change Mitigation, Solo, Central Java, Indonesia
- RGC (October 2013): Cambodia Climate Change Strategic Plan 2014-2023. Prepared by the National Climate Change Committee for the Royal Government of Cambodia *
- RGC (July 2014): National Strategic Development Plan (NSDP) 2014-2018. Prepared by Ministry of Planning for the Royal Government of Cambodia
- RGC (January 2016): Climate Change Action Plan 2016-2018. Prepared by Ministry of Environment for the Royal Government of Cambodia
- RGC and MoE (June 2012): The Cambodian government's achievements and future direction in sustainable development. National Report for Rio+20 - United Nations Conference on Sustainable Development. Royal Government of Cambodia and Ministry of Environment *
- RGC/NCDD (January 2009, revised October 2017): Commune/sangkat fund project implementation manual. Prepared for the Royal Government of Cambodia by National Committee for the Management of Decentralization & Deconcentration Reform

- Sayers, Paul, Li Yuanyuan, Gerry Galloway, Edmund Penning-Rowsell, Shen Fuxin, Wen Kang, Chen Yiwei and Tom Le Quesne (April 2013): Flood risk management: A strategic approach. Published by UNESCO, Paris, ISBN 978-92-3-001159-8 *
- Sovacool, Benjamin K., Anthony Louis D'Agostino, Amireeta Rawlani and Harsha Meenawat (August 2012): Improving climate change adaptation in least developed Asia. Environmental Science & Policy Volume 21. Elsevier
- Touch, Vina (July 2015): Action-oriented assessment of climate change vulnerability. CRBOM Small Publications Series no. 52, Center for River Basin Organisations and Management, Solo, Central Java
- UNDP Cambodia (December 2014): Practitioner's handbook: Implementing the Vulnerability Reduction Assessment. 2nd Edition. Phnom Penh, Cambodia
- UN Environment (December 2017): Climate change adaptation technologies for water: A practitioner's guide to adaptation technologies for increased water sector resilience. ISBN 978-87-90634-07-0 *
- UN Environment-DHI, UN Environment and IUCN (August 2018): Nature-based solutions for water management: A primer. ISBN No: 978-92-807-3709-7 *
- UN-Habitat (April 2016): Guiding principles for city climate action planning. United Nations Human Settlements Programme (UN-Habitat), Nairobi
- UNEP (August 2014): Green infrastructure guide for water management: Ecosystem-based management approaches for water-related infrastructure projects. Prepared for United Nations Environment Programme (UNEP) by the International Union for Conservation of Nature (IUCN), The Nature Conservancy (TNC), UNEP-DHI Partnership Centre on Water and Environment, and the World Resources Institute (WRI). ISBN: 978-92-807-3404-1 *
- UNFCCC-CTCN (October 2018): Pilot training programme in flood and drought management tools for climate resilience and GCF concept note development, Phnom Penh, 17-20 September 2018. UNFCCC Climate Technology Centre and Network *
- Vann Monyneth (July 2015): Climate change adaptation with immediate benefits. CRBOM Small Publications Series no. 53, Center for River Basin Organisations and Management, Solo, Central Java
- Watt Botkosal (September 2012): IWRM-based Mekong River Basin Development towards the Green Growth-National Perspective, presented at the Chuncheon Global Water Forum 2012, 'Water and Cities', Hotel Bears, Chuncheon City, Korea
- Watt Botkosal (June 2011): Water security, food security and livelihoods in Cambodia and the Lower Mekong Basin. Paper presented at the Conference on 'The New Politics of Water: Water Security and Economic Growth in Emerging Economies', Chatham House, London
- Watt Botkosal (March 2011): IWRM best practices in the 4-Ps pilot basin - towards integrated river basin management. International Conference on Watershed Management, 9-11 March 2011, Chiang Mai, Thailand
- Watt Botkosal (October 2009): IWRM-based development in a small Cambodian river basin. CRBOM Small Publications Series no. 9, Centre for River Basin Organizations and Management, Solo, Central Java, Indonesia
- Watt Botkosal (July 2009): Water resources for livelihoods and economic development in Cambodia. CRBOM Small Publications Series no. 2, Centre for River Basin Organizations and Management, Solo, Central Java, Indonesia
- Yusuf, Arief Anshory and Herminia A. Francisco (January 2009): Climate Change Vulnerability Mapping for Southeast Asia. Prepared under the Economy and Environment Program for Southeast Asia (EEPSEA)

Annex A: Terminology

Source: NCDDS (July 2018)

Adaptation: Adjustment to new circumstances - actual or expected. This can be in terms of behaviour, technology or structural intervention. Examples include the introduction of better suited production systems and infrastructure. See *climate change adaptation*

Adaptation deficit: The case of being underprepared for (present and/or future) climate conditions. This can be related to a less than optimal allocation of limited resources, resulting in for example inadequate urban drainage infrastructure or water storage capacity

Climate change (CC): Medium- or long-term changes in the general weather, such as temperature and rainfall, over time scales of decades. Climate changes have always occurred. The present trend is related to CO₂ emissions to the atmosphere, causing global warming, erratic rainfall (causing floods and drought), sea level rise, and sea water acidification (affecting coral habitats)

Climate change adaptation (CCA): Measures - structural or non-structural - to reduce the adverse consequences of climate change. Examples include appropriate land use ('keeping people away from floods'), improved water storage capacity, flood protection schemes ('keeping floods away from people'), weather and flood forecasting services, etc.

Climate change mitigation: Measures that address the causes of global warming, by reducing greenhouse gas emissions and the greenhouse gas levels in the atmosphere. Examples include improved energy efficiencies, reduced energy consumption, tree planting/ reforestation, etc.

Decentralization (in today's Cambodia): The transfer of authority from the national level to the sub-national levels

Deconcentration: To implement central decision-making authority via local departments (for example a provincial department of a ministry). *(In today's Cambodia)*: A development towards active involvement of sub-national administrations in various governance tasks

Disaster: A sudden event with significant adverse impacts, such as a flood, a land slide, or a severe drought. *Disaster risk reduction* is measures - structural or non-structural - to reduce the adverse consequences of a disaster. A particularly severe disaster is called a *catastrophe*

Exposure: Being subject to some pressure (for example climate change). In Cambodia, the exposure can vary significantly over short distances

Institutional capacity is a measure of an organization's ability 'to do what it is supposed to do'. This may comprise its management, expertise/skills, tools, knowledge base, and financing

Impact: The same as effects, or consequences, of a given exposure. The impact can be positive or negative. A high (negative) impact will occur in case of a high exposure and a high vulnerability (or a low resilience)

Flood preparedness: Due awareness of the flood risk, and knowledge and ability of appropriate response. The flood preparedness can be supported by measures such as awareness campaigns, education, flood forecasting services, and flood proofing measures

Land subsidence: A general gradual sinking of the land, caused by downward tectonic movement and/or excessive groundwater withdrawal. Cambodia is located on the *Sunda Plate*, along with southern Viet Nam, South Thailand and most of Malaysia. This plate is presently sinking by some mm per year, or the same order of magnitude as the ongoing sea level rise. From decade to decade, vertical tectonic movements can change between uplifts and subsidence. Subsidence caused by groundwater withdrawal is irreversible

Multiple benefits solutions (for climate change adaptation): A solution with substantial additional benefits beyond the objective of CCA and/or DRR; and which may be valuable even if the climate doesn't change in the way that is presently expected

No-regrets solutions: Same as 'multiple benefits solutions' (for climate change adaptation)

Red tape: A name for delays or obstruction caused by time-consuming procedures in the government system. (Originally, the red tape was used for tying up the document files in the Indian public administration)



Resilience: The ability to endure and/or to recover from a given exposure. A high resilience indicates a low vulnerability, and the other way around

Sea level rise: Global warming causes a sea level rise, due to the water column expanding with higher temperatures and the melting of ice in Arctic areas, combined with local conditions

Scenario (used for planning in a context of uncertainty): A possible (conceivable) future combination of circumstances. For example, a scenario can reflect '*business as usual*' (= no adaptation) plus a certain exposure to climate change

SWOT analysis (of strengths, weaknesses, opportunities and threats) can support an opportunity-oriented (or '*pro-active*') development planning, as compared with '*problem-oriented*' or '*responsive*' planning. (The two perspectives can be combined)

Transparency (*within CC-related governance*): Application of clear and accessible rules, modalities and decision-criteria

Vulnerability: The extent of the (adverse) impacts of a given climate change exposure or a given disaster. The vulnerability can be seasonal and is always site-specific depending on the population density, the land use, the value of buildings and infrastructure, the cultivation systems and other production systems, the preparedness, and the resilience

Weather: The conditions of the atmosphere at a given location and a given time: Temperature, precipitation, cloud cover, fog, sunlight, air pressure and wind. Compare with *climate*

Annex B: Abstracts

Most documents are available from the Internet, and all are available with the TA Team. They are listed chronologically, reflecting the evolving agenda for sub-national CCA and DRR.

Additional related abstracts are provided in KP-1 (NCDDS September 2017) and KP-5 (NCDDS July 2018).

Disclaimer: Most of the abstracts have been compiled for the purpose of the present document and have not been vetted by the authors or publishers.

Contents

- B.1 Stakeholder engagement
- B.2 National report for Rio+20
- B.3 Climate-resilient irrigation
- B.4 Mainstreaming climate resilience and disaster risk reduction into national investment planning
- B.5 Flood risk management: A strategic approach
- B.6 Cambodia Climate Change Strategic Plan (CCCSP) 2014-2023
- B.7 Green infrastructure guide
- B.8: Water resources management in Cambodia
- B.9: Cambodia's implementation of Sustainable Development Goals
- B.10 Using indicators for improved water resources management
- B.11 Climate change adaptation technologies for water
- B.12 Nature-based solutions for water management
- B.13 The GCF simplified approvals process
- B.14 The effectiveness of climate resilience grants to local governments
- B.15 Good governance for low-emissions development strategies