

**South Asia Regional Workshop on lessons learnt in
Strategy Implementation on Climate Change
Adaptation in Water Sector**

FINAL REPORT

9 – 10 September 2014

Colombo Sri Lanka

Organised by

South Asia Co-operative Environment Programme (SACEP)

In collaboration with

Global Water Partnership South Asia (GWP-SAS)

South Asia Regional Workshop on lessons learnt in Strategy Implementation on Climate Change Adaptation in Water Sector

Introduction

The South Asia Regional Workshop on lessons learnt in Strategy Implementation on Climate Change Adaptation (CCA) in Water Sector was held on 9 to 10 September 2014 in Colombo, Sri Lanka. The workshop was organised by South Asia Co-operative Environment Programme (SACEP) in partnership with Global Water Partnership (GWP) South Asia.

The workshop gathered policy makers, researchers and practitioners of seven countries of the South Asian region together and provided a platform to share and to learn from each other on Strategy Implementation on Climate Change Adaptation in Water Sector. Approximately 30 participants representing Ministries of Environment, Water Resources and Climate Change of SACEP member countries and SACEP, GWPO, GWP SAS, UNDP and Sri Lanka Water Partnership attended the workshop. List of participants is given in Annex I

Climate change is one of the most important environmental, social and economic issues facing the world today. In the Asia and the Pacific region and particularly in the South Asia Sub-region, there is evidence of prominent increases in the intensity and/or frequency of many extreme events. Despite growing efforts to reduce greenhouse gas emissions, some impacts such as higher temperatures, more intense floods, droughts, wildfires, and rising sea levels are now inevitable. It must be planned for and adapted to these changes, to minimize the negative impacts and enhance the benefits to natural systems, societies, and human activities and well-being. This challenges decision making at all levels, from individuals to governments, as well as in business and industry.

The workshop was designed to provide an opportunity for the water sector to become aware of the National Adaptation Plans and start preparing to engage with the process in their countries. This means inter-alia identifying some of the sectoral and cross sectoral issues that are relevant for the sector to consider in light of the medium term orientation of the NAP process. Some of these issues relate to better institutional coordination, building capacity for risk analysis and appraisal of adaptation options and better monitoring. It was organized in response to the decision 10.2.14 of the 13th meeting of Governing Council of South Asia Co-operative Environment programme (SACEP) held on 3 – 5 December 2013 at Islamabad and as well as the Sixteenth Meeting of the Heads of State or Governments of the Member States of the South Asian Association for Regional Cooperation (SAARC) in Thimphu, Bhutan, on 28-29 April 2010, which recognised that effective responses, both on mitigation and adaptation should be formulated and implemented at regional and international levels, declared the Thimphu Statement on Climate Change and agreed to implement number of recommendations collectively.

The objectives of the workshop were to: share experiences and assist governments in developing strategies for adaptation to climate change in the water sector; assess the information needs in the region to define such adaptation strategies; and especially to

address the benefits of and mechanisms for trans-boundary cooperation in climate adaptation activities and to generate understanding of the NAPs process and how this could be potentially connected to developing strategies for adaptation to climate change in the water sector.

Scope and focus of the workshop was:

- Showcase the strength & weakness of strategy implementation in SA Countries,
- Highlight the institutional mechanisms in strategy implementation,
- How robust adaptation decision making can proceed in the face of uncertainty about climate change and its impacts.
- Explore practical adaptation policies and approaches, and share strategies for decision making from the international to the local scale.
- Introduce and examine new tools and methodologies for adaptation.

The workshop helped in cross learning on strategy implementation in country level and regional cooperation on climate change with respect of water. It was also expected to make connections between lessons learnt with broader processes such as the National Adaptation Plan process.

Inauguration

Before starting the technical sessions, there was an inauguration with the participation of the Secretary, Ministry of Environment and Renewable Energy, Government of Sri Lanka representing Hon' Minister of Environment and Renewable Energy, Director General of SACEP, Regional Coordinator of the GWP-SAS and representative from GWPO. The Agenda is given in Annex II.

At the inauguration, Mr S.M.D.P. Anura Jayatilake; Director General SACEP said "integrating adaptation measures in sectoral and institutional level is important to safeguard existing and future development progress in the light of current climate variability. Mainstreaming of climate change adaptation into developmental planning is still in early stages in most of the countries in the South Asia Region. All of us need to give much attention and speed-up these processes". Full speech is given in Annex III.

The message of Honourable Minister Susil Premajayantha, Ministry of Environment and Renewable Energy, Government of Sri Lanka emphasised that water is and should be at the centre of climate change adaptation. Water is essential for many sectors while climate change has important implications on these sectors especially through the hydrological changes. Therefore dealing with water is an important part of adaptation to climate change. He said "in this scenario, working together as a region is very essential and it will give you more strength and save time and money". Full statement is in Annex IV.

After giving a brief introduction to GWP and GWP SAS Ms Priyanka Dissanayake, Regional Coordinator GWP SAS mentioned that "the countries in the region are diverse in terms of water resources but there are similarities in managing them and learning from each other is important. There are 54 transboundary rivers in the region and regional cooperation is

essential while Maldives is unique. Drought & floods happen at the same time and more integrated approach to water management is required to address that."

Technical Sessions

The inauguration was followed by the two days technical sessions. First technical session was on Policies and Strategies and was chaired by Mr. Anura Jayatilake, Director General of SACEP, during which the chair of the workshop provided an overview of the current prevailing policies and strategies at national and regional levels, gaps and the needs for changes. Session's chair also emphasized the mandate given by the Governing Council of SACEP to SACEP Secretariat on the subject area at its previous sittings since 2006.

Three framing presentations were made to set the necessary context for the workshop: the first was an overview of the National Adaptation Plan (NAP) process globally by Ms. Susanne Skyllerstedt; Team Member of the Water, Climate and Development Programme, GWPO, Stockholm. The second was on Climate Change Impacts & Water Adaptation Strategies: Institutional Frameworks – National Enabling Environment (Water Laws & Institutes) by Mr. Batu Krishna Uprety; Expert Member, Climate Change Council and Chair of the UNFCCC Least Developed Countries Expert Group (LEG), and representative from GWP Nepal. The third one was done by Ms. Rohini Kohli; NAP-Global Support Programme Team, United Nations Development Programme (UNDP) Regional Office, Bangkok on the topic of Identifying Opportunities for Strengthening CCA in medium-term planning – NAP process preparatory elements.

The focus of the session was on the newly developed GWP Strategy "towards 2020" – towards a water secure world, the post 2015 development agenda, and the development of NAPAs and NAPs. After an introduction by Ms. Skyllerstedt to the National Adaptation Plan (NAP) process at global level and GWP support to the process through the Global WACDEP and the NAP-GSP, Ms. Kohli explained the difference between NAPA and NAP, going into more detail on some specifics in the NAP processes and UNDP's efforts in supporting the process. Presentations of the technical sessions are in Annex V.

The technical session two, a post lunch session was chaired by Ms. Rohini Kohli from NAP-Global Support Programme Team, United Nations Development Programme (UNDP) Regional Office, Bangkok and it was on Country Strategy & Institutional Framework. In this session, each participating country was requested to do a presentation on implementation experiences of Climate Change Adaptation strategy and institutional mechanisms: lessons and recommendations in their respective countries.

The representatives from Afghanistan, Bangladesh and Bhutan presented their country presentations during the session. Other three countries; Maldives, Pakistan and Sri Lanka presented their country presentations at the third technical session which was chaired by Mr. Batu Krishna Uprety; Expert Member, Climate Change Council and Chair of the UNFCCC Least Developed Countries Expert Group (LEG), and representative from GWP Nepal.

In the discussions, the importance of information dissemination, coordination, transboundary water management, protection of glaciers, enhancing the national capacity and aligning CCA

with the national plan were some of the issues raised by the experts. Country presentations are in Annex VI.

The second day was organized into two sessions. The first session was a participatory session and it was facilitated by Mr. Batu Krishna Uprety. Two breakout groups were organized in this session where country teams were given four questions on national adaptation planning and linking up to the NAP process in their respective countries. Examples covered current adaptation planning and practices related to water resources, including IWRM plans, policies and strategies, lessons learnt, good practices, gaps and needs. Two questions linked up with the NAP process which can connect adaptation planning to national development plans and public investments. The results of the discussions were presented by a representative of each group. Annex VII

It was emphasized that CCA should be led by the Government Authorities. There is a need for building new strategies on existing mechanisms and for multi-stakeholder participation in the processes. A flexible implementation approach, training and capacity building were suggested for smooth implementation of CCA in countries. Further, rainwater harvesting, conservation of streams, construction of water collection tanks, identification of new water resources, conservation and management of existing water resources were proposed as adaptation actions.

The second session of the second day focused on tools and methodologies and it was chaired by Ms. Angela Klauschen, Senior Network Officer, Global Water Partnership (GWP), Stockholm. There were two presentations by Mr Uprety on Climate Change Impacts in Water Sector: localized adaptation and integrate water focused adaptation into planning process with case of Nepal and Dr Herath Manthrithilake, Head, Sri Lanka Development Initiative, IWMI, on Strategies and activities: Linking river basin management adaptation activities to national and regional climate change adaptation. The session was focused on understanding the different types of adaptation planning and practices to reduce vulnerability and enhance the resilience of water resources. Two presentations were made to provide an overview of the different types of adaptation planning and practices, including policy instruments for climate change adaptation. These were followed by four case study presentations on adaptation planning and practices at different levels.

This was followed by presentations of the key discussion points from the previous sessions held over the two days. An interactive discussion session with the participants took place to share lessons learnt, good practices and further needs.

In the final session of the second day, Participants made recommendations for potential further action on possible climate change adaptation in water sector at regional level. The workshop concluded with summary of the proceedings by the Director General of SACEP.

Analysis of key issues addressed at the workshop

Participants shared key issues related to the vulnerability of freshwater resources and the impacts of climate change on freshwater resources, related sectors and ecosystems.

Climate change poses a major challenge to water managers and users as well as to policymakers at different levels. Given the intrinsic linkage between freshwater resources and other sectors and ecosystems, increased vulnerability of freshwater resources owing to climate change may affect, inter alia, the following: ecosystems and biodiversity; agriculture and food security; land use and forestry; water supply and sanitation; health; urban settlements and infrastructure; and energy supply and electricity generation.

Impacts on regional water availability and accessibility could lead to regional water crises, resulting in destabilization, violence and conflict, which would affect poor and vulnerable people the most. Assessment of climate change impacts on water resources at the basin or catchment level allows for a comprehensive assessment of social, ecological and economic pressures.

Population growth, land-use change, demographic change, including migration, and urbanization are among several social stressors that exacerbate the vulnerability of water resources and have concomitant impacts on water availability and access. Climate change and variability therefore act as exacerbating agents on existing vulnerability. Without effective institutions and adaptive management practices, vulnerable countries will continue to experience adverse climate change impacts. Transboundary cooperation is also crucial to limit the vulnerability of water resources.

Adaptation strategies may include different components: integrated water resources management (IWRM), risk assessment and analysis; improving methods, management and decision-making capacity; and engaging decision makers and policymakers, practitioners, researchers and vulnerable communities, among other stakeholder groups.

Resilience-building involving a combination of bottom-up and top-down approaches, early warning systems and disaster risk management strategies offer development benefits in the short to mid term and reduce vulnerability over the long term.

Possible next steps

It is crucial to enhance the establishment of data information systems through data platforms, clearing houses and metadatabases on observational data.

Exchange good practices from multiple levels, in particular those that have the potential to be scaled up and that are science- and evidence-based;

Exchange experience on transboundary and regional cooperation in adaptation. Greater sharing of information regarding (successful) adaptation measures as well as scientific data on climate variability is needed and can be promoted through regional knowledge centers and networks.

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**South Asia Regional Workshop on “Lessons Learnt in Strategy
Implementation on Climate Change Adaptation in Water Sector”**

9-10 September 2014

Colombo, Sri Lanka

AGENDA

Day 1

9 September 2014

Time	Session Details
08:30-09:00	Registration
09:00-09:45	<p>Inaugural & Framing Session</p> <ul style="list-style-type: none"> - National Anthem - Lighting of Oil Lamp - Welcome address – SACEP - Address by GWP - Address by the Chief Guest, Hon’ Susil Premajayantha, M.P. Minister of Environment and Renewable Energy
09:45-10:15	Tea Break
10:15-12:30	<p>Technical Session 1 : Policy & Strategy Chairperson : Mr. Anura Jayatilake – Director General, SACEP</p> <p><i>Overview of the National Adaptation Plan (NAP) process globally – Susanne Skyllerstedt, Global Water, Climate and Development Programme Global Water Partnership (GWP), Stockholm - 30 minutes</i></p> <p><i>Climate Change Impacts & Water Adaptation Strategies : Institutional Frameworks – National Enabling Environment (Water Laws & Institutes) Batu Krishna Uprety – Executive Member, JVS/GWP Nepal – 30 minutes</i></p> <p><i>Identifying Opportunities for Strengthening CCA in medium-term planning – NAP process preparatory elements Rohini Kholi, Rohini Kohli, Lead Technical Specialist, National Adaptation Plan - Global Support Programme (NAP-GSP), Green Low Emission Climate Resilient Development Strategies, UNDP - 30 minutes</i></p> <p>Discussion -30 minutes</p>
12:30-13:30	Lunch
13.30-15.10	<p>Technical Session 2 : Country Strategy & Institutional Framework <i>Each country to make a 20 min. presentation followed by discussion</i> Chairperson: Rohini kholi</p> <p><i>Implementation Experience of CCA strategy and institutional mechanism: lessons & recommendations,</i></p> <p>Representative <i>Afghanistan</i> Representative <i>Bangladesh</i> Representative <i>Bhutan</i></p> <p>Discussion -20 minutes</p>

15:10-15:30	Afternoon Tea
15:30-17:15	<p>Technical Session 3 : Country Strategy & Institutional Framework <i>Each country to make a 20 min. presentation followed by discussion</i> Chairperson: Mr. Batu Uprety</p> <p>Implementation Experience of CCA strategy and institutional mechanism: lessons & recommendations,</p> <p><i>Presenters:</i></p> <p>Representative <i>Maldives</i> Representative <i>Pakistan</i> Representative <i>Sri Lanka</i></p> <p>Discussion - Wrap-up -20 minutes</p>
19.00	DINNER

Day 2
10 September 2014

Time	Session Details
08:30-11:00	<p>Technical Session 4 : Participatory Session Facilitated by Mr. Batu Uprety</p> <p><i>Breakout groups on different types of adaptation planning and practices related to water resources at different levels.</i></p> <p>Group 1: National level (National planning of IWRM plans, policies & strategies) Group 2: Basin Water Management (functions of water management at National Level)</p> <p>Each breakout group will address the following issues:</p> <ul style="list-style-type: none"> ▪ Current adaptation planning and practices related to water resources, including IWRM plans, policies & strategies, • Lessons learned (good practices, gaps and needs) • Two questions to link up with the NAP process which can connect adaptation planning to national plans and public investments (Questions will be given at the session)
11:00-11:30	Tea Break
11:30-12:00	Presentation by each group: 15 minutes
12:00-13:00	Lunch Break
13:00-14:00	<p>Chairperson: Angela Klauschen, Senior Network Officer, Global Water Partnership (GWP), Stockholm</p> <p>Technical Session 5 : Tools & Methodology <i>Climate Change Impacts in Water Sector: localized adaptation and integrate water focused adaptation into planning process with case of Nepal</i> <i>Batu Krishna Uprety – Expert Member, Climate Change Council & the Chair,</i></p>

	<p><i>Least Developed Countries Group Expert Group (LDG), Nepal – 30 minutes</i></p> <p><i>Strategies and activities : Linking river basin management adaptation activities to national and regional climate change adaptation</i></p> <p><i>Dr. Herath Manthrithilake, Head, Sri Lanka Development Initiative, International Water Management Institute, HQ, Colombo, Sri Lanka</i></p> <p><i>Discussion</i></p>
14:00-14:30	Closing Remarks by: Director General, SACEP
14:30	Tea

Director General's Speech at the South Asia Regional Workshop on lessons learnt in Strategy Implementation on Climate Change Adaptation in Water Sector, 9 – 10 September 2014 in Colombo, Sri Lanka

Hon' Minister
Excellencies,
Delegates from our member countries,
Resource persons,
All invitees,
Ladies and Gentlemen,

It is my great privilege and pleasure, as the Director General of SACEP to welcome you all to this important event on behalf of SACEP. This two day workshop is organized in collaboration with Global Water Partnership, GWP South Asia. Objectives of this workshop are to;

- a. Share experiences and assist governments in developing strategies for adaptation to climate change in the water sector,
- b. Assess the information needs in the region to define such adaptation strategies, and especially to address the benefits of and mechanisms for trans-boundary cooperation in climate adaptation activities and,
- c. Generate understanding of the NAPs process and how this could be potentially connected to developing strategies for adaptation to climate change in the water sector.

Excellencies, ladies and Gentlemen,

Climate change is an extra burden for those living in poverty. Floods and droughts continue to cause suffering. These affect livelihoods by reducing crop yields as well as destroying homes. Climate change can slow down economic growth, making it harder to reduce the number of people living in poverty, and it can also create new poverty traps particularly in urban areas. We can already see the impact climate change is having. Rainfall patterns are changing. Glaciers are shrinking. The permafrost is thawing. You may aware that the Intergovernmental Panel on Climate Change (IPCC) predicts the impacts of heat waves, droughts, floods, cyclones, and wildfires are all likely to increase.

The IPCC report also predicts that climate change, without adaptation, will reduce yields for the world's major crops: wheat, rice and maize. Some projections predict yield losses of 25% by 2050. This will cause some serious challenges as demand is expected to rise. As a result the gap between supply and demand is simply going to widen. Farmers and pastoralists in semi-arid regions will be particularly vulnerable to shortages in water for crops and livestock. Fish catches in the tropics are also predicted to go down, impacting on incomes and diet.

Although many sectors are dealing with the impacts of climate change, water resources are particularly affected. Already unreliable in much of the South Asian region, access to water

is predicted to become more challenging with the continued onset of climate change. As agricultural and water sectors are sensitive to climate change, climate resilient investments are essential to enhance livelihood opportunities and promote sustainable economic growth.

At present, major developmental activities are made in climate sensitive regions highly exposed to droughts, floods and cyclones without giving due considerations to climate change.

Excellencies, ladies and Gentlemen,

Climate change is real and adapting to it is an urgent issue for all—particularly for least developed countries and small island developing states. All South Asian countries are belong to either category or both.

Therefore, integrating adaptation measures in sectoral and institutional level is important to safeguard existing and future development progress in the light of current climate variability. Mainstreaming of climate change adaptation into developmental planning is still in early stages in most of the countries in the South Asia Region. All of us needs to give much attention and speed-up these processes.

I believe, this two day workshop will give you an opportunity to discuss and share the much needed thoughts in this regard.

Once again, I welcome all of you and wish the next two days deliberations a success.

Thank you.

**Speech by Hon Susil Premajayantha, M.P. Minister of Environment and Renewable Energy
at the Inauguration of South Asia Regional Workshop on lessons learnt in Strategy
Implementation on Climate Change Adaptation in Water Sector on 9th September 2014 at
Hotel Galadari, Colombo**

Excellencies,

Distinguished Delegates from South Asian Countries

Resource Persons

Ladies and Gentlemen,

It is my great pleasure to address you at the inauguration of this South Asia Regional Workshop on lessons learnt in Strategy Implementation on Climate Change Adaptation in Water Sector. On behalf of the Government of Sri Lanka, I welcome all delegates from South Asian countries, the experts, and officials from national agencies participating in this important workshop.

Let me thank South Asia Cooperative Environment Programme (SACEP) for organizing this very important workshop. I think it is a timely organized event as you all witness, while I am speaking here, thousands of Sri Lankan people in north central part of the country and Hambantota, Moneragala Districts are suffering due to a severe drought.

According to science, expected climate change impacts include decreased water availability, decreased crop productivity in many parts of the world, increased frequency and intensity of storms, and loss of biodiversity and associated ecosystem services. Next to impacts on life and livelihoods, impacts could drive unprecedented migration and lead to precarious security situations.

Even under the most ambitious mitigation scenarios, adapting to the adverse effects and increased risk of climate change is a necessity for all countries.

For developing countries like South Asia's, such measures are critical to safeguard progress made towards achieving the Millennium Development Goals and to prevent poverty levels from worsening due to climate impacts. The need is, of course, most apparent and most urgent in island states like Sri Lanka and Maldives, which are already facing salt water intrusion and loss of land due to rising sea levels.

Among all the climate change impacts in South Asia region, those related to water resources are probably most essential. There is a justified concern that all three principal classes of water-related problems – having too little water, too much water, or polluted water may get exacerbated by climate change.

Of course one cannot say with absolute scientific certainty that these events are direct climate change impacts, although they fall squarely into scientific projections of possible

impacts. The bottom line is that these events illustrate what could come with much greater frequency and intensity in the future.

Although there is still a lot of uncertainty about the impacts of climate change in many regions and basins the weather will be more extreme, with more frequent and more intense droughts and floods. It should be realised that changes in the extremes will have more effect and are indeed more important to know than changes in the averages alone. In looking at adaptation measures, natural variability in different countries provides lessons how adaptation can be done and how resilience can be improved.

Ladies and Gentlemen,

Water is and should be at the centre of climate change adaptation. Water is essential for many sectors while climate change has important implications on sectors especially through the hydrological changes. An important part of adaptation is therefore dealing with water. Because of the many interlinkages, today's problems with the demands for natural resources are complex.

I believe that the necessary adaptation measures need to be placed or worked out not only for water sector alone, but in other important sectors as well in order to face any eventuality due to the climate change. In this scenario, working together as a region is very essential and it will give you more strength and save time and money.

With this, I invite our foreign friends to visit some parts of our scenic places during your stay in Colombo, Sri Lanka. I wish you a pleasant stay in Colombo and finally, I wish the two days of workshop is a success.

Thank you.

Annex V



Overview of the National Adaptation Plan process globally

South Asia Regional Workshop on
Lessons Learnt in Strategy Implementation on Climate Change
Adaptation in the Water Sector
Colombo, Sri Lanka, 9-10 September 2014

Susanne Skyllerstedt,
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www.gwp.org

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Presentation outline

1. GWP and national adaptation planning: the Water, Climate and Development Programme (WACDEP)
2. The NAP process at global level
3. Development of the NAP process at global level
4. Guidance and support to the NAP process
5. NAP Global Support Programme

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2

1. GWP and national adaptation planning

Climate change will impact water security


Changes in the water cycle are one of the main ways in which the impacts of climate change will be felt – this includes increasing variability, increasing extremes (droughts, floods), and higher ambient temperatures (including warmer water temperatures).

Resilience to Climate Change is a necessity

GWP is responding to the climate change challenge through the Global Water, Climate and Development Programme (WACDEP)

The Programme is linking water, climate and economic development agendas, strengthening coordination frameworks, and enhancing coherence, finance and institutional capacity

www.gwp.org



3

Global Water, Climate and Development Programme (WACDEP)


Goal

"to promote water as a key part of sustainable regional and national development and contribute to climate change adaptation for economic growth and human security"

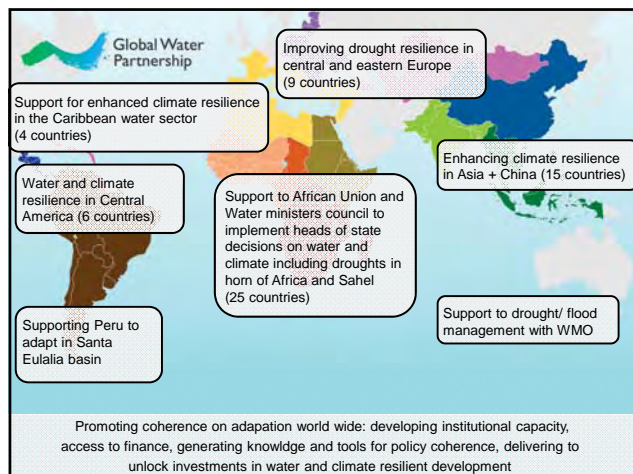
Overall objective

"to support integration of water security and climate resilience in development planning and decision making processes"

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1



2. The NAP process

- encourages countries to advance from NAPA and other individual adaptation experiences to comprehensive, medium- and long-term planning and implementation for adaptation that is driven by a country owned NAP framework, strategy or roadmap
- will be the primary statement of national adaptation needs and priorities, including financial needs
- will be implemented through an overarching national adaptation programme with clearly identifiable leadership and resources that would spawn activities that formulate plans, implement them, and then monitor progress, effectiveness and gaps, in order to inform further actions

Objectives of the NAP process

- To reduce vulnerability to the impacts of climate change, by building adaptive capacity and resilience;
- To facilitate the integration of climate change adaptation, in a coherent manner, into relevant new and existing policies, programmes and activities, in particular development planning processes and strategies, within all relevant sectors and at different levels, as appropriate.

(decision 5/CP.17)

3. Development of the NAP process at global level

2010

Establishment under the Cancun Adaptation Framework, as a process to enable LDCs to formulate and implement NAPs, building on NAPAs, to:

- identify medium- and long-term adaptation needs, and their integration into development planning
- Developing and implementing strategies and programmes to address those needs

Other developing country Parties were also invited to employ the modalities formulated to support the NAPs. (Decision 1/CP.16)

2011

Decision on the initial guidelines for the NAP process.

Bilateral and multilateral agencies were invited to support the NAP process and to establish support programmes and guidelines (Decision 5/CP.17)

2012
Information from the GEF, on how it could enable activities undertaken as part of the national adaptation plan process in LDCs (FCCC/SBI/2012/MISC.3)

2013

- Technical guidelines for the formulation of NAPs developed by the UNFCCC LEG (2013)
- The NAP process and guidelines were introduced in the first NAP Expo in June 2013
- Start-up of NAP-GSP for LDCs in June 2013

2014

- Information on support for formulation of NAPs in non-LDCs
- Submissions from Parties and relevant organizations on the experience with the application of the initial guidelines for the formulation of the NAPs to the SBI to prepare recommendations for consideration and adoption at COP20 (FCCC/SBI/2014/MISC.1)

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NAP related projects in LDCs

- 47 LDCF projects integrate CCA into 106 national development policies, plans and frameworks in 35 LDCs
- 49 projects will allow 33 LDCs to enhance their national hydro-meteorological and climate information services
- Institutional, technical and human capacity building is being provided to 251 key national and sub-national agencies/institutions; with more than 460,000 people receiving training on CCA

Source: R. Sundstrom, GEF Sec, 2014

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4. Guidance and support for NAPs

Initial guidance
on the modalities for establishing NAPs by LDCs was adopted in 2011 during COP17

Technical guidelines
for the preparation of NAPs were published by the LDC Expert Group (LEG) in early 2013

Supplementary guidance
e.g. Water Supplement and others on health (WHO) and agriculture (FAO)

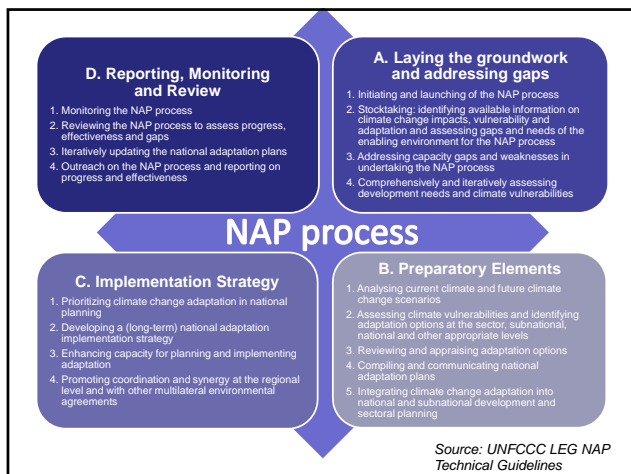
Support programmes
e.g. NAP-Global Support Programme

→ **Development and implementation of NAPs**

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Publications from the UNFCCC LEG

www.gwp.org 12 Global Water Partnership



NAP Guiding principles

- Continuous planning process at the national level iterative updates and outputs
- Country owned, country-driven
- Not prescriptive. Flexible and based on country needs
- Building on and not duplicating existing adaptation efforts
- Participatory and transparent
- Enhancing coherence of adaptation and development planning
- Supported by comprehensive monitoring and review
- Considering vulnerable groups, communities and ecosystems
- Guided by best available science
- Taking into consideration traditional and indigenous knowledge
- Gender-sensitive

Source: UNFCCC LEG

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NAP Expo 8-9 August 2014

A platform for NAP teams, organizations, agencies and other stakeholders to exchange experience, lessons learned and ideas on the NAP process, through:

- Promoting and mobilizing action and support for the formulation and implementation of NAPs;
- Sharing technical knowledge, including on methods, data and tools;
- Identifying gaps and needs for effective implementation of NAP processes.

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Supplementary guidance to the NAP process

Water supplement

- Aligns with the objectives of the NAP process
- Builds on but does not replace the existing NAP technical guidelines
- Applies a 'water lens' to the NAP Technical Guidelines
- Follows the structure of the technical guidelines, encapsulating the Elements and steps with key messages for water, how to address it, and case examples

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NAP-GSP
NATIONAL ADAPTATION PLAN GLOBAL SUPPORT PROGRAMME

5. NAP Global Support Programme

- Established through funding from the GEF-LDCF to provide support to LDCs in the efforts to advance country specific NAPs
- UNDP UNEP programme with many collaborating partners: the GEF Secretariat, UNFCCC, WHO, Global Water Partnership, FAO, IFAD, UNISDR and UNITAR. GIZ is a collaborator.
- Currently running support to LDCs in the NAP process. Upcoming support through a non-LDC Global Support Programme

NAP-GSP
NATIONAL ADAPTATION PLAN GLOBAL SUPPORT PROGRAMME

What does the NAP-GSP do?

- Support LDCs with one-on-one technical assistance on demand to get started on the NAP process
- Provide tools and training to support key steps of the NAP process in-country
- Facilitate exchange of lessons and knowledge through South-South and North-South cooperation

NAP-GSP
NATIONAL ADAPTATION PLAN GLOBAL SUPPORT PROGRAMME

NAP-GSP is providing support to the following countries for their National Adaptation Plan process:

Least Developed Countries (LDCs)
 LDCs which have officially requested to NAP-GSP – and already received – ongoing one-on-one support and mobilization for targeted technical assistance
 LDCs which have requested NAP-GSP support which is forthcoming

NAP-GSP
NATIONAL ADAPTATION PLAN GLOBAL SUPPORT PROGRAMME

Timeline August 2013-May 2014

Month	Activity
Feb 14	NAP-C Camb 24th Feb
Mar 14	The on S proc 14-1
Apr 14	APRIL 14
May 14	NAP-GSP support mission to Niger 12th May 2014 - 23rd May 2014
Jun 14	JUN 14
Jul 14	JUL 14
Aug 14	AUG 14

An initial mission to begin NAP-GSP support to Niger took place in May 2014, by UNDP and Global Water Partnership (GWP).


ONGOING COUNTRY SUPPORT FROM NAP-GSP TO LDCS

[Full timeline on NAP-GSP website](#)

NAP-GSP
NATIONAL ADAPTATION PLANNING PROCESS - GLOBAL SUPPORT PROGRAM

Lessons learned from the GSP

- Most LDCs agree that NAP is both a process and a document
- The connection between the NAPA and NAP process has shown to be an important concern for countries. In particular for those who have challenges with NAPA implementation
- Climate finance for NAP is a priority for most countries including finance for implementation
- Institutional coordination is a challenge for all countries
- Exchange of experiences can promote learning
- Broadening the NAP process beyond environment ministries to integrate with planning and budgeting processes and national development strategies is a long term process



NAP-GSP
NATIONAL ADAPTATION PLANNING PROCESS - GLOBAL SUPPORT PROGRAM

Emerging issues based on GSP experience


- Demand for technical support to advance the NAP process from LDCs is growing. The NAP-GSP has received requests from over 26 countries till date
- Need for sustained investments for the NAPs
- The NAP is a country driven process that needs overarching efforts and partnerships between Planning, Finance and Environment ministries
- More targeted and sustained one-one-one support is required based on specific institutional and national context in LDCs
- Regional thematic workshops provide an avenue for technical training as well as South-South exchange



Thank you!

susanne.skyllerstedt@gwp.org

More information:
 NAP-GSP Website www.undp-alm.org/projects/naps-ldcs
 GWP WACDEP www.gwp/wacdep.org
 The NAP Central <http://unfccc.int/nap/>

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Climate Change Impacts and Water Adaptation Strategies: Institutional Frameworks

Batu Uprety
 Executive Member
 Jalsrot Vikas Sanstha/GWP Nepal
 9 September 2014

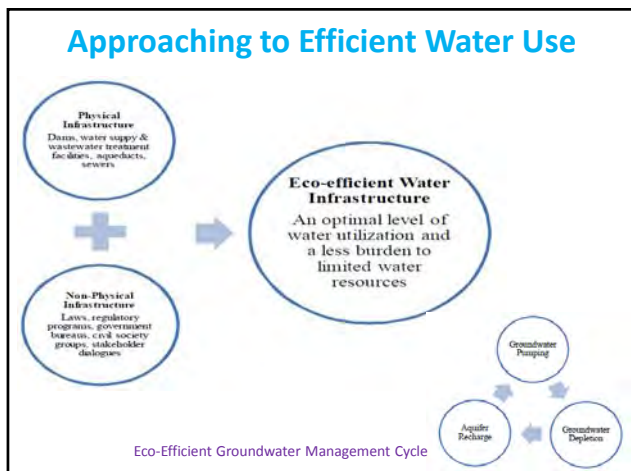
The Challenge

- Water – basic element for all life forms and its use for:
 - ✓ Drinking and maintenance of all life-forms
 - ✓ Irrigation and food production
 - ✓ Hydropower generation
 - ✓ Recreation etc.

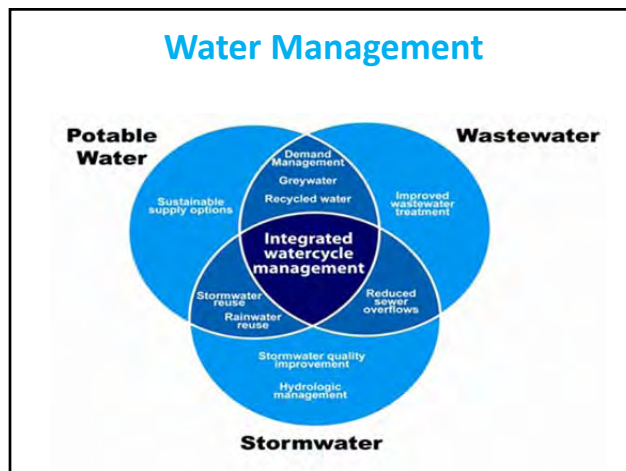
Key challenges in water sector

- Meeting the needs of the growing population and life forms
- Inadequate access/availability to water and inefficient use
- Intense and extreme climate change-induced disasters
- Too much water and too little water, water source drying
- Myriad of formidable challenges posed by climate change

Approaching to Efficient Water Use



Water Management



Perceiving the Impacts

- Climate change will continue to happen
- Natural change might impact positively and anthropogenic change will impact adversely
- Impact interpretation varies and might be perception-based, need-based and understanding-based
- How we perceive the event such as 'too much water and too little water'?
- Mostly climate-induced events affect human beings and resources adversely
- Are these impacts significant? How to evaluate significance?

Climate Change Impacts on Water

- Glaciers continue to shrink and lose mass
- Between 2003–2009, global glacier ice loss was estimated to be within $251 \pm 65 \text{ Gt yr}^{-1}$ to $371 \pm 50 \text{ Gt yr}^{-1}$
- Snow cover decreased by around 8% (7 m km^2) over the period of 1970–2010 compared to 1922–1970 period
- In Nepal Himalaya, ice reserve decreased by 129 km^3 between 1977 and 2010 and temperature rise by $0,6^\circ\text{C/decade}$
- Medium confidence – significant human influence on global scale changes on precipitation patterns, gradually increase in the 21st century, and non-uniform change, semi-arid regions will likely experience less precipitation
- Sea level rise – continue to be serious, New Zealand/Tuvalu
- Increased climate-induced disasters such as floods
- etc



Climate Change Impacts on Water

- Increased water scarcity – migration and effect on marriage (specific Nepalese case)
- Increased flooding
- Decline in farm production/challenge to food security – irregular and uncertain precipitation, mostly early or late monsoon
- Possible decline in hydropower generation
- In Nepal, annual GDP loss by 1.5 to 2% (USD 270–360m/yr) due to current climate variability and extreme events; additional demand of HEP 2800MW by 2050 due to CC and USD 2.6b (present value)

↓
Myriad of problems

Responses: GWP

- Realisation of sound policies, knowledge, and action for increasing water security needs
- Moving *Towards 2020* – focus on achieving a global vision of **water secure world**
- **Defined mission and goals**
- **Thematic areas**
- Climate resilience and water security
- Transboundary water security
- Food and water security
- Urbanisation and water security
- Energy and water security
- Ecosystems and water security



Cross-cutting issues

- Gender equity
- Youth engagement

A Post-2015 Global Goal for Water



Approved by UN-Water at its 20th meeting on 27 January 2014

Targets

- Achieve universal access to safe drinking water, sanitation and hygiene
- Improve by (x%) the sustainable use and development of water resources in all countries
- All countries strengthen equitable, participatory and accountable water governance
- Reduce untreated wastewater by (x%), nutrient pollution by (y%) and increase wastewater reuse by (z%)
- Reduce mortality by (x%) and economic loss by (y%) from natural and human-induced water-related disasters

Development Outcomes

- | | | |
|-----------------------|-------------|--|
| Healthy people | } through { | <ul style="list-style-type: none"> • Universal access to safe drinking water, sanitation and hygiene, improving water quality and raising service standards • The sustainable use and development of water resources, increasing and sharing the available benefits • Robust and effective water governance with more effective institutions and administrative systems • Improved water quality and wastewater management taking account of environmental limits • Reduced risk of water-related disasters to protect vulnerable groups and minimize economic losses |
| Increased prosperity | | |
| Equitable societies | | |
| Protected ecosystems | | |
| Resilient communities | | |

Moving Towards Eco-efficiency



UNFCCC Focus

- Article 4 paragraph 1(e) of the Convention states that all Parties, taking into account CBDR and their specific national and regional development priorities, objectives and circumstances, shall cooperate in preparing for adaptation to the impacts of climate change;
- Develop and elaborate appropriate and integrated plans for coastal zone management, **water resources** and agriculture ...
- Water resources discussion at present under NWP
- Parties and observers have additional opportunities to develop this thematic area

Adaptation Strategies

- Identifying and implementing water-related adaptation actions
- Integrating into planning and programming processes by identifying 'entry points';
- Linking adaptation with income-generating activities and socio-economic development - incentivising vulnerables
- Developing, promoting and using climate-friendly technologies and mobilising human resources
- Promoting and implementing local level plans to localise adaptation actions
- Developing **public-private and civil society** partnership;
- Institutionalising knowledge generation and communication
-

Actors on Water (Agenda 21)

- Decision-makers;
- International organisations and External Support Agencies;
- Industrial water users;
- Scientific and research institutes;
- Water services providers, including private entrepreneurs, for drinking water supply and sanitation , irrigation and drainage, hydropower & other water uses;
- Water and water-related departments;
- Municipalities and local authorities;
- Users and user groups;
- Professional organisations; and
- National and international NGOs.

Potential Actors ...

- Identifying local, national, regional to international levels working on water quality and quantity
- Strengthening local and national water related institutions both at governmental and non-governmental levels, including regional centres
- Integrating climate change adaptation and/or mitigation issues into the institutional mandate
- Formulating and/or amending policies, programmes and legal instruments to incorporate climate change aspects
- Developing and/or strengthening enforcement and compliance mechanism
- **Solution is action with means of implementation**

Adaptation into Water Sector?

- NAPA – most urgent and immediate adaptation needs
 - NAP – medium and long-term needs of the LDCs and developing countries
 - How could we influence water-focussed NAPA prioritised adaptation actions?
 - How could we influence and support NAP process to address water sector?
 - How could we mobilise existing institutions and human resources to re-focus water sector to adapt to, and build resilience to climate change?
- ↓
- Reduce vulnerability and integrate adaptation into relevant sectors

Strengthening and Mobilising the Institutions

- Support government institutions in integrating, designing, implementing and monitoring and evaluation of climate change adaptation
- Strengthen NGOs in providing required services to the government in enhancing capacity for integration and implementation
- Strengthen academe for research and human resource development to support to develop policies and strategies on climate change
- Encourage international and regional bodies to further support the national governments and replicate **proven** technologies
- Encourage GWP country offices to support the government in developing **policy briefs**, capacity building and providing **technical backstopping** etc.



Identifying Opportunities for Strengthening CCA in medium-term planning

NAP process preparatory elements

9-10 September 2014, South Asia Regional Workshop on "Lessons Learnt in Strategy Implementation on Climate Change Adaptation in Water Sector"

Resilience to Climate Change – a necessity

Scale of Damage in Thailand (2011)

Estimated Losses: \$15-20 billion (Swiss Re/Munich Re)
\$21 billion (prop. damage); \$22 billion (opp. costs) (World Bank)



Climate Change can no longer be treated as only as environment issue



Environment/Climate Change/UNDP

Scale of Finance for Adaptation

Bangladesh - \$5b over next 5 years to address current climate change with costs rising each year

Malawi- The National Climate Change Investment Plan (2014) and includes a USD 5 billion investment over next 5 years in adaptation, mitigation, capacity development and research & technology.



Environment/Climate Change/UNDP




What is the NAP process?



The national adaptation plan (NAP) process was established under the Cancun Adaptation Framework (2010). It enables Parties to formulate and implement national adaptation plans (NAPs) as a means of identifying medium- and long-term adaptation needs and developing and implementing strategies and programmes to address those needs. It is continuous, progressive and iterative process which follows country-driven, gender-sensitive, participatory and fully transparent approach.



-UNFCCC



Objectives of the NAP process



The CoP to the UNFCCC has agreed on the following objectives

- To reduce vulnerability to the impacts of climate change, by building adaptive capacity and resilience; and
- To facilitate the integration of climate change adaptation, in a coherent manner, into relevant new and existing policies, programmes and activities, in particular development planning processes and strategies, within all relevant sectors and at different levels, as appropriate.

Nature of national adaptation planning under the NAPs process as per the CoP, the process is

- continuous, progressive and iterative; and
- the implementation of which should be based on nationally identified priorities, including those reflected in the relevant national documents, plans and strategies; and
- should be coordinated with national sustainable development objectives, plans, policies and programmes.

Background

From fragmentation to coordination and integration of adaptation

2001

2007

2010

Last 10-15 years

- Focus on assessing impacts and improving the science of CC including projects/scenarios.
- Exploration of different frameworks to define adaptation, small funds to test different ideas
- Addressing urgent and immediate adaptation needs in LDCs through NAPAs.

COP 15 Bali Action Plan:

- Long-term and cooperative action by Parties initiated.



COP 16 Cancun Adaptation Framework:

- New institutional structures and processes established to address adaptation in a coordinated and coherent manner.
- Adaptation Committee
- National adaptation plans
- Work programme on loss and damage

Over time:


- Parties recognized the fragmented nature of adaptation under the Convention.

Modified from UNFCCC Presentation, Feb 2014

NAP vs. NAPA

Elements	NAPA	NAP
Objective	Immediate and urgent adaptation needs, identify priority projects	A process to address mid/long-term adaptation needs
UNFCCC Process Decision	Marrakesh Accord – COP 7 (2001)	Cancun Adaptation Framework – COP 16 (2010)
Target Countries	LDC	LDC plus other interested developing countries
Funding Support	Primarily – LDCF for preparation and implementation	Preparation – LDCF Implementation – GEF, LDCF/SCCF, Bilateral, Domestic, etc.



NAP-GSP
NATIONAL ADAPTATION PLAN GLOBAL SUPPORT PROGRAMME

LEG Guidelines

LEAST DEVELOPED COUNTRIES

NATIONAL ADAPTATION PLANS
Technical guidelines for the national adaptation plan process

JULY 2012 (REVISED) DECEMBER 2013

TABLE 3. CORE UNDERSTANDING OF THE ELEMENTS OF THE FORMULATION OF NATIONAL ADAPTATION PLANS, WHICH MAY BE UNDERTAKEN AS APPROPRIATE*

ELEMENT A. LAY THE FOUNDATION AND ADDRESS GAPS

1. Establishing and updating the NAP process
2. Identifying existing national instruments on climate change related, sustainable and disaster risk reduction and the need for the NAP process
3. Addressing capacity gaps and weaknesses concerning the NAP process
4. Conducting a risk analysis, assessing the climate risk and climate vulnerability

ELEMENT B. PREPARATORY ELEMENTS

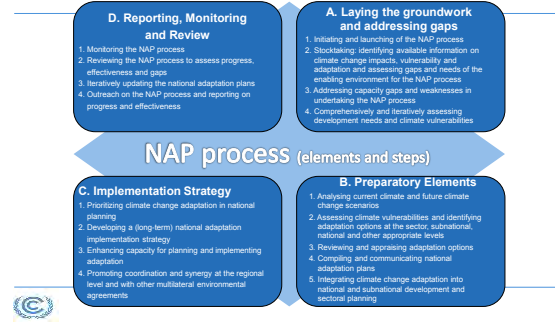
1. Analyzing current climate and future climate scenarios
2. Assessing climate vulnerabilities and identifying adaptation options at the sector, subnational, national and other appropriate levels
3. Reviewing and appraising adaptation options
4. Compiling and communicating national adaptation plans
5. Integrating climate change adaptation into national and subnational development and sectoral planning

ELEMENT C. IMPLEMENTATION SYNERGIES

1. Promoting climate change adaptation in relevant planning
2. Analyzing the role of the national development and sectoral planning
3. Promoting coordination and synergy at the regional level and with other multilateral environmental agreements

ELEMENT D. REPORTING, MONITORING AND REVIEW

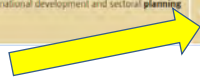
1. Monitoring the NAP process
2. Reviewing the NAP process to assess progress, effectiveness and gaps
3. Iteratively updating the national adaptation plans
4. Outreach on the NAP process and reporting on progress and effectiveness



Preparatory Elements of the NAP process



Element B. Preparatory elements	
1. Analyzing current climate and future climate change scenarios	<ul style="list-style-type: none"> Analysis of current climate Future climate risks and uncertainty/scenario analysis Communicating projected climate change information
2. Assessing climate vulnerabilities and identifying adaptation options at sector, subnational, national and other appropriate levels	<ul style="list-style-type: none"> Climate vulnerability assessment at multiple levels Ranking climate change risks and vulnerabilities Scoping adaptation options
3. Reviewing and appraising adaptation options	<ul style="list-style-type: none"> Appraisal of adaptation options
4. Compiling and communicating national adaptation plans	<ul style="list-style-type: none"> Draft national adaptation plans Finalize NAPs and process endorsement Communicate NAPs at national level
5. Integrating climate change adaptation into national and subnational development and sectoral planning	<ul style="list-style-type: none"> Opportunities and constraints for integrating climate change into planning Building capacity for integration Integration of adaptation into existing planning processes

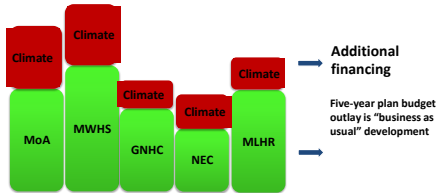


Mainstreaming CC into Existing Planning: Key Considerations

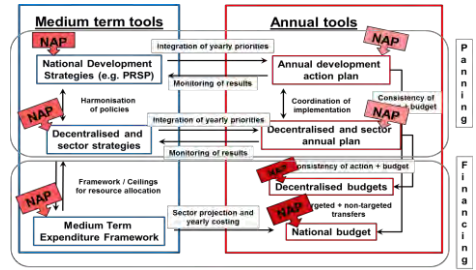


1. Governments need to address adaptation to climate at all levels in planning, because climate risks magnify development challenges.
 2. Existing development planning is informed by understanding of CC implications.
 3. Development plans are adjusted to reflect CC risks and opportunities.
 4. Continuous monitoring and update of national development plans to reflect CC risks and opportunities in the future.
- RESULT!** Existing planning processes take CC into account in medium and long-term plans.

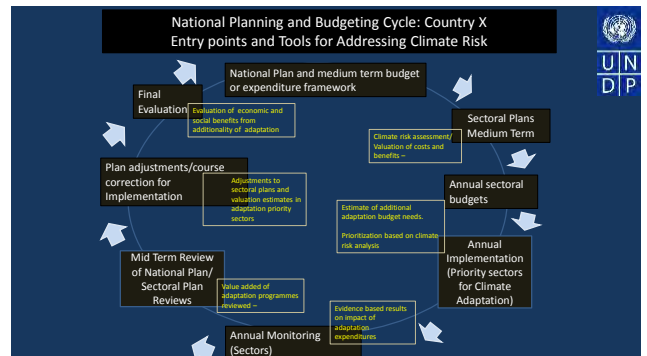
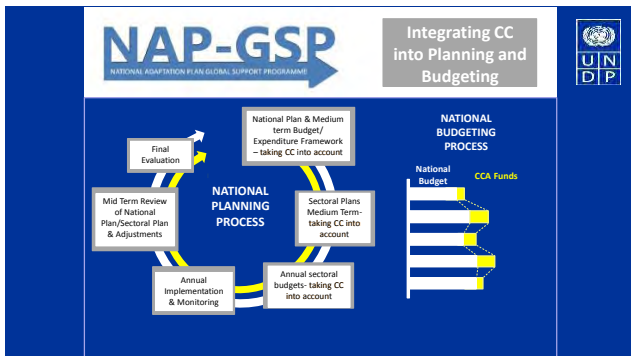
Impacts of climate over development as usual



Empowered lives. Resilient nations.



Source: GIZ adapted from Uandela (2010)



Foundations for integrating climate change into medium- and long-term planning

Through poverty reduction strategies and development strategies

COOK ISLANDS
To Kaveinga Nui
 (Pathway for Sustainable Development in the Cook Islands)
 Living the Cook Islands Vision - A 2020 Challenge
 National Sustainable Development Plan (2007-2010)

KINGDOM OF CAMBODIA
 Suddh, Mahang, King
National Strategic Development Plan (2014-2018)
 ROYAL GOVERNMENT OF CAMBODIA

Rwanda Vision 2020
 UNDP
 Empowered lives Resilient nations

Catalyzing Adaptation Finance

Key Barriers to Adaptation Finance

A Defining Framework for Medium and Long-Term Climate Change Adaptation Challenge

UNDP
 Economic and Technical Assistance

Making Systems and Institutions Climate Finance Ready is Important

Financial Planning	Accessing Finance	Delivering Finance	Monitor, Report & Verify
<ul style="list-style-type: none"> Assess needs and priorities, and identify barriers to investment Identify policy mix and sources of financing 	<ul style="list-style-type: none"> Multiple access channels Blend and combine finance Formulate project, programme, sector-wide approaches to access finance 	<ul style="list-style-type: none"> Implement and execute project, programme, sector-wide approaches Build local supply of expertise and skills Coordinate implementation 	<ul style="list-style-type: none"> Monitor, report, and verify flows of results and funding Performance-based payments

UNDP
 Empowered lives Resilient nations

- Elements are not one-size-fits-all
- Efforts don't need to start from scratch
- Readiness is an ongoing process

So, What Does This All Mean?

Making Sure that Efforts Have an Impact on the Ground

20

Vanuatu/SCCF

Guinea-Bissau/LDCF

Jamaica/NPA

Haiti/LDCF

Strengthening Country Systems

Some lessons to bear in mind

Focus on the process – Inclusive national dialogue and strong ownership from multiple stakeholders

- Establish institutional structures and mechanisms that are demand led and enable innovation, accountability and transparency
- Strengthen capacities of national institutions to plan, budget, track and monitor climate finance
- Build public capacity to design and implement national programmes and projects that are results (benefit) based and sustainable
- Establish robust M&E systems to track and measure climate finance effectiveness

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- National Climate Change Policies need to clearly link to development planning and finance. (CC Fiscal Frameworks, national co-ordination mechanisms and national capacity building initiatives)
- Innovative Instruments and financing modalities need to be explored
- Challenging political economy as discussion starts to involve non traditional stakeholders e.g. Private sector, Ministries of Finance and planning
 - Priority setting is **lengthy & complex** due to competing agendas among sectoral ministries
- Opportunity for South-South learning – How do we get this right?
- Use of country systems and effective institutions – Key issues to address also through the development effectiveness platform

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Some Early Insights

Catalyzing Adaptation Finance


- Country-driven processes subject to **political changes/ sensitivities**
- **Technical capacities** for iterative climate considerations in planning and budget required (to assess finance needs, first need to understand costs/benefits of adaptation over different time scales)
- **Elements are not one-size-fits-all** - Different configurations of these four components can exist within institutions, between institutions, or across national or sectoral systems.
- **Not starting from scratch** – Many countries have parts of these systems in place. The challenge is identifying them and organizing them to produce an effective system at the national level.
- **Readiness is an ongoing process** – tools and guidebooks are available to support countries as the climate finance landscape evolves

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Catalyzing Adaptation Finance

Focus of UNDP's Work

ACTION ON THE GROUND	CAPACITY ENHANCEMENT	BARRIER REMOVAL	POLICY DIALOGUE
<ul style="list-style-type: none"> Policy development: How is CC policy formulated? Are national CC strategies developed? Provide a framework for sector-wide approaches & to incentivise private investments Institutional structures: What are roles & responsibilities of institutions involved in managing CC response & their interaction? Public financial management: How to quantify & track CC-related expenditures in the budget? Developing bankable adaptation projects including training on the economics of adaptation 			<p>NAP-GSP, LECS, CPEIR</p> <p>LDCF/SCCF/AF/Bilateral financed projects</p> <p>NAP-GSP, LECS, CPEIR, LDCF/SCCF/Bilateral financed projects</p> <p>CPEIR</p> <p>Economics of Adaptation</p>

 Empowering lives. Resilient worlds.

NAP-GSP **OVERVIEW OF NAP-GSP ACTIVITIES**
(As per approved LDCF Council Approved Project Document)



IN-COUNTRY INSTITUTIONAL SUPPORT:


- Promote common understanding of the UNFCCC NAP guidelines among Ministries of Environment, Planning, Finance & key sectoral ministries
- Support to developing NAP preparation strategies ("roadmaps")
- Support stock-taking of existing initiatives and gap analysis
- Support identification of entry points in existing planning processes
- Capacity assessments of institutional gaps for long-term adaptation planning

REGIONAL TRAININGS:

- Thematic Regional Workshops on Elements of NAPs: All LDCs in each region: Asia, Pacific, Africa. → Knowledge sharing clinics
- Mobilization of **technical experts to deliver training** on planning skills in the context of adaptation (GWP in Rwanda; Economics of Adaptation training programmes in Asia, Africa, and the Pacific)

PARTNERSHIPS TO SUPPORT ADVANCEMENT OF NAPs:

- South/South global dialogue & knowledge exchange
- Outreach and dissemination of lessons and best practices, enhancement of practitioners' networks and peer-to-peer learning



Localising Climate Change Adaptation in Water Sector: A Case of Nepal

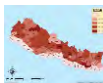
Batu Uprety
Executive Member
Jalsrot Vikas Sanstha/GWP Nepal
10 September 2014

Outline of the Sharing

- LAPA Genesis
- Learning from LAPA Implementation
- LAPA for Water Sector – WACREP component
- LAPA for Lamatar Village Development Committee in the Kathmandu Valley
- Potential Activities of LAPA
- Preliminary Approach for LAPA Implementation

LAPA Genesis

- Nepal's climate vulnerability
- National Adaptation Programme of Action (NAPA), prepared being a LDC in 2010
- Issue raised in NAPA workshop in 2009 to localise climate change adaptation
- Climate Change Policy, 2011 – focus on adaptation and low carbon development
- National Framework on Local Adaptation Plan for Action (LAPA), 2011 endorsed
- Implementation of NAPA prioritised adaptation actions with LAPA approach

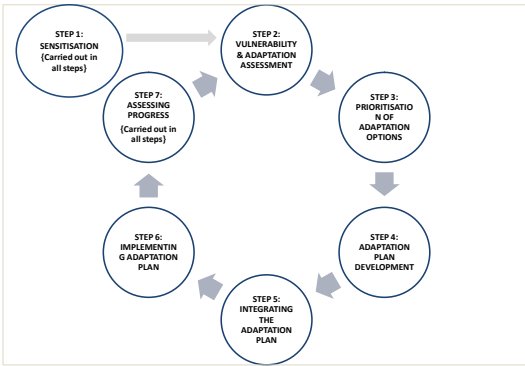


National Framework on LAPA

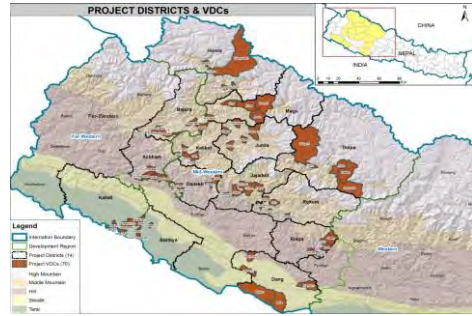
- The LAPA Framework provides an opportunity way to **integrate local peoples' adaptation needs for climate change resilience into local-to-national planning systems**
- The LAPA Framework ensures that the process of integrating climate change resilience into local planning is **bottom-up, inclusive, responsive and flexible**



LAPA STEPS



Localising Climate Change Adaptation



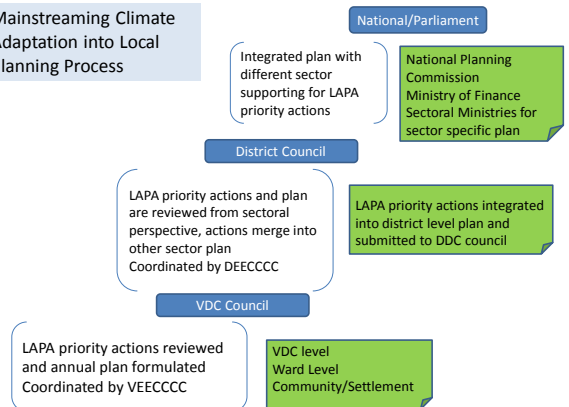
99 VDCs and 1 Municipality of 14 Districts of Mid and Far West Nepal

Learning from LAPA Implementation

- LAPA prepared and adaptation actions prioritised by the climate vulnerable people – **strong ownership**
- People's **accumulated and performance-based knowledge** utilised in identifying and prioritising adaptation actions
- Fund channelling (> 80% of the total budget to field level activities) is **possible** and channelled through CC Budget Code
- Decentralised institutional mechanism works well** including for coordination mechanism – Climate Change Council, Multi-stakeholder Climate Change Initiatives Coordination Committee, Regional Climate Change Coordination Committees, District Environment, Energy, Climate Change Coordination Committees, and Village/Municipality Environment, Energy, Climate Change Coordination Committees – **hierarchy of coordination mechanism**
- Mainstreaming Adaptation into Planning Process – it is possible and needs efforts
- LAPA has modified the traditional approach
- Strong ownership at different levels



Mainstreaming Climate Adaptation into Local Planning Process



Learning from LAPA ...

- Government should be at the **driver's seat** and should be supported for mainstreaming adaptation actions
- **Building on existing systems is helpful** for early implementation and integration
- Engagement of multi-sector and **multi-stakeholders is essential** for ownership and sustainability
- **Flexible implementation approach** provides multiple opportunities to be responsive to the local context
- Training or orientation and sharing of good practices enables local communities to successfully implement activities for livelihood improvement
- LAPA also provides other agencies a basis to support climate vulnerable communities to adapt to climate change

Integrating Adaptation into Planning

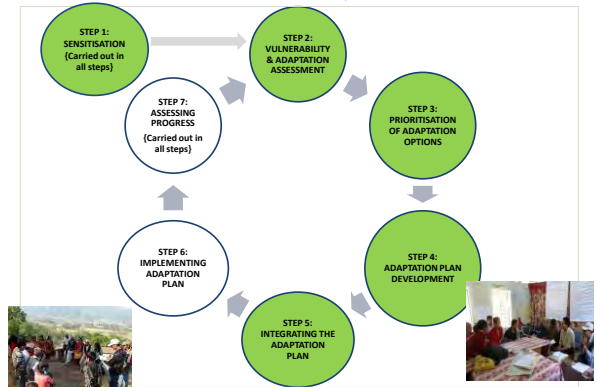
- LAPA has twin objectives:
 - ✓ Integration into local to national planning process
 - ✓ Preparing and implementing stand-alone document
- Water is most precious resources and greatly impacted from climate change phenomenon
- JVS/GWP Nepal prepared water-focused LAPA under Water and Climate Resilience Programme (WACREP) for Lamatar Village Development Committee in the Kathmandu Valley
- Water-focused LAPA prepared using National Framework on LAPA
- Lamatar LAPA drew attention of local governments and water experts

Lamatar LAPA

- A small VDC in the Kathmandu Valley with 1345 hectares and about 9,030 Population
- Landuse – 41% forest, 52% agriculture and 7% others
- 11 community forests functioning
- LAPA objectives - Create awareness, assess climate change impact, recognise vulnerable communities, and identify and prioritise adaptation options
- Methodology – use of LAPA framework such as sensitization workshop, VAA, problem assessment, vulnerability ranking etc. – **intensive consultation**



LAPA Steps



Water-related Adaptation Actions

Problems

- Drying-up of water sources and reduced water in existing sources
- Improper management of water, and source-based conflict
- Inadequate availability for drinking and irrigation

Proposed adaptation actions

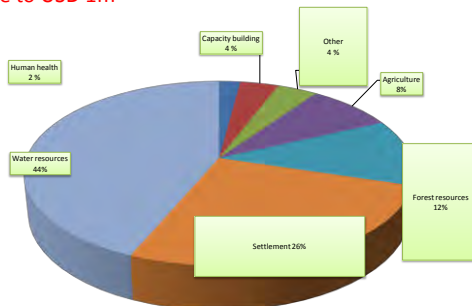
- Rainwater harvesting
- Conservation of streams
- Construction of water collection tanks
- Seeking of new water sources
- Conservation and management of water resources
- Waste and sewage management

Other Adaptation Options

- **Agriculture** - development of organic farming, modern agriculture technologies, and irrigation facilities
- **Forest resources** - plantation with high value crops, eco-tourism, scientific forest management , and installation of biogas plants etc
- **Health** - regular health services, and increase the capacity of health post
- **Urban settlement** – adoption of housing code, and construction of road and trails for cycling
- **Capacity building** – training on economic and skill development, and CC sensitisation etc.

Estimated Budget

Total budget:
close to USD 1m



Implementation Arrangement

- Integration into local annual plan
- Allocation of budget from village fund and district fund
- Phase-wise implementation – prioritising to poor, marginalised and vulnerable groups
- JVS/GWP Nepal to support in local initiatives in accessing fund and providing technical backstopping on demand-basis
- Dissemination – 16 September



Integrating Adaptation into Planning

- With your suggestion “Climate Change Impacts in water sector: localized adaptation and integrate water focused adaptation into planning process with case of Nepal”.

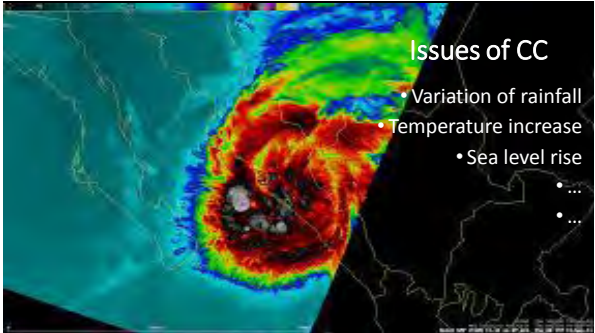
Strategies and Activities: *Linking river basin mgmt. adaptation activities to national and regional CC adaptation*

H. Manthirithilake
IWMI
SACEP CC adaptation in Water sector
9-10 Sept. 2014
Colombo

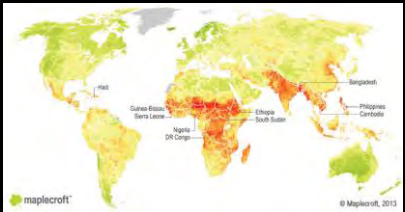


Issues of CC

- Variation of rainfall
- Temperature increase
- Sea level rise
- ...
- ...

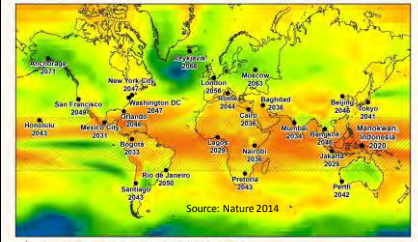


Climate Change Vulnerability 2014



© Maplecroft, 2013

IWMI A water-secure world www.iwmi.org



Source: Nature 2014

The global mean year of climate departure is 2047. The mean for the tropics (shades in the hatched areas) is 2028, compared to 2053 for all other latitudes.

Year of climate departure

IWMI A water-secure world www.iwmi.org

Consequences

- Floods and droughts
- Glacier melt
- Land degradation/slides
- Saltwater intrusion
- Agriculture
- Health
- Infrastructure
- Ecosystem/ env. flows...
- ...



Men search for coins and gold in the polluted waters of the Ganga river at Sangam after the Kumbh Mela festival in Allahabad, Uttar Pradesh, India



A water-secure world

www.iwmi.org

Consequences

- Surface and groundwater (quantity)
- Water quality issues
- Trans basin issues
- Disaster issues / floods, droughts, food security,.../
- National and Regional links



A water-secure world

www.iwmi.org

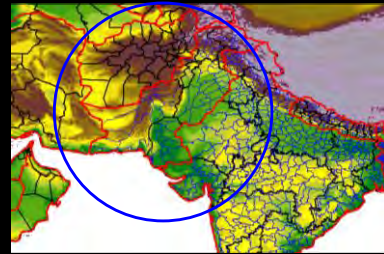
Link 1: Data Management

- Collection
- Validation
- Storing
- Sharing
- Updating

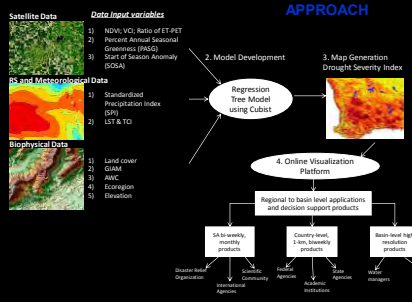


www.slwater.iwmi.org

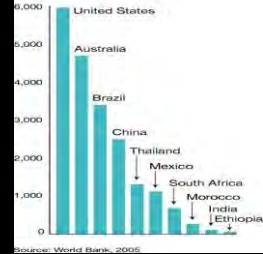
THE STUDY AREA

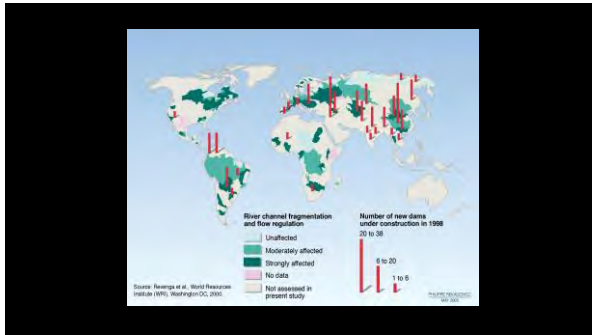


1. Integrated Database Development



Cubic metres per capita



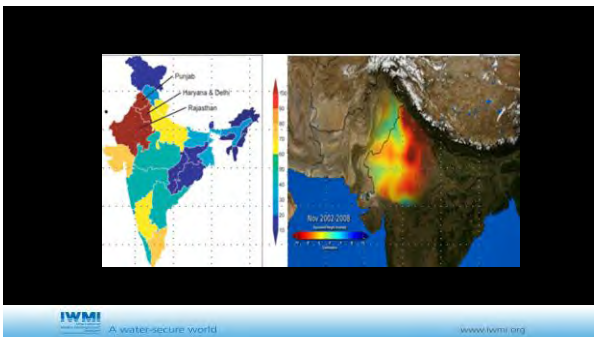


User/Access Management

Completely Public	Public with Registration	Files Restricted	Files strictly Restricted
All users can access metadata and download files	All users can access metadata but need to agree to terms & conditions of use to download files	All users can access metadata, but files are only available to restricted Users	Only Project team can access metadata and files. This means that the data can not even be found by all within the agency (un-authorized users) .

Link 2: Policy coherence

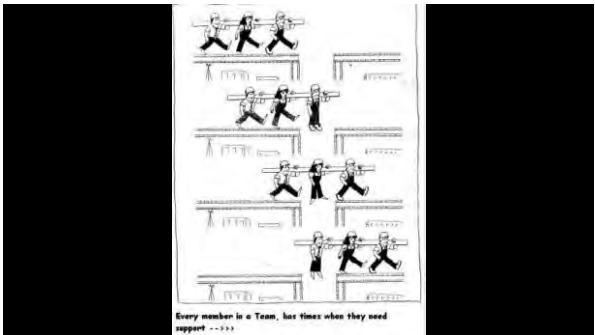
- National
- Trans basin
- Regional





Link 3: Knowledge sharing

- Networking
- Data / information exchange
- Lesson learned / learning from each other
- Best practices
- Managing emergencies



Not easy, but possible!

Thank you!



Transboundary water

IWMI

A water-secure world

www.iwmi.org



Islamic Republic of Afghanistan

National Environmental Protection Agency

&

Ministry of Agriculture, Irrigation and
Livestock

Natural Resource General Department

Steps Taken on Climate Change Adaptation

By: AbdulBaqi Noori & Naeem Hunrri

Date : 9/Sep./2014

Introduction

- ▶ Afghanistan is a mountainous country in South and Central Asia ,
- ▶ Afghanistan lies between 29° and 38° N and 61° and 75° E.
- ▶ Capital Kabul
- ▶ Total area 652000 Km²
- ▶ Population 27 million
- ▶ Official language Dari and Pashto
- ▶ Provinces 34
- ▶ Ethnic group 20
- ▶ Population increasing rate 1.9% / year
- ▶ Around 80 % of people are living in rural area

Con..

- ▶ 80% of Afghanistan People are rely on, Agriculture and Natural Resources,
- ▶ It is a land locked country & No way to the sea ,
- ▶ Main source of surface water is snow fall in high mountains,
- ▶ Highest elevation ... 7315 m. (Nowshakh),
- ▶ lowest elevation ... 258m. (Amu Darya),

(Afghanistan Initial national Communication to the U.N.Framework Convention on Climate Change 2012).

Con...

- ▶ Natural forest 1.9 million ha. (3%) – 1978,
- ▶ Decreased to 1.35 million ha. 2000s
- ▶ Presently increased to 1.7 million ha.
- ▶ 12–15% of lands is proper for cultivation (irrigated agriculture + rain fed agriculture),

Con...

- ▶ Afghanistan has an arid & semi-arid continental climate with cold winter and hot summer,
- ▶ The climate varies from one region to another due to dramatic change in topography,
- ▶ The wet season generally from winter through early spring but the country at whole is dry ,
- ▶ The snow season averages October–April in the mountains and varies considerably with elevation,

Con...

- ▶ The total annual precipitation of the northern, southern and western parts is less than 200 mm,
- ▶ So these regions become susceptible to periodic drought,
- ▶ But south eastern parts ,as a result of Indian monsoon, is estimated to be in range of 320– 1100 mm,

(national report of I.R. of Afghanistan On the implementation of U.N. Convention to Combat Desertification)

Con...

Current Climate trends (1960–2008):

- ▶ Mean annual temperature has increased by 0.6°C since 1960 at an average rate around 0.13°C per decade,
- ▶ Mean rainfall has decreased slightly at an average rate of 0.5 mm per month (2% per decade).

(Afghanistan Initial national Communication to the U.N.Framework Convention on Climate Change 2012)

Afghanistan Land Use

	Area (ha)	Percentage
Irrigated agricultural land	3 302 007	5.1
orchards	94 217	0.1
Intensively irrigated	1 559 654	2.4
Intermittently cropped	1 648 136	2.6
Rain fed agricultural land	4 517 714	7.0
Forest land	1 337 582	2.1
Rangeland	29 176 732	45.2
Barren land	24 067 016	37.3
Marsh land	417 563	0.6
Water bodies	248 187	0.4
Snow-covered area	1 463 101	2.3
Urban area	29 498	0.05
Total land area	64 559 396	100

Source: Provincial Land cover Atlas of Islamic State of Afghanistan . FAO/UNDP project AFG/90/002, 1990

Water Resources

- ▶ Theoretically Afghanistan isn't faced to water shortage,
- ▶ Amount of surface water is about 57 billion m³ they are distributed and managed within 5 water basins consist of:
- ▶ Pange –Aamo,Northern,Helmand,Harirod Morghab and Kabul basins,
- ▶ Each of these basins is defined as independent hydrological unit ,
- ▶ But despite of plenty sources of water ,lack of capacity bounds uses of water ,

Annual Discharge of River Basins

River Basin	Annual Discharge(billion cubic meters)
Pange – Amu	22.00
Northern	1.88
Helmand	9.3
Harirod–Morghab	3 . 06
Kabul	20.76
Total	57

Source : (Afghanistan Initial national Communication to the U.N.Framework Convention on Climate Change 2012)

Water destruction



Energy Sources

- ▶ Renewable energy offers the great hope for Afghanistan in general and rural energy in particular,
- ▶ This includes hydro, solar, wind, geothermal, biogas and wood,
- ▶ Hydro represents significant untapped resources,
- ▶ It is estimated Afghanistan has 18400 MW of untapped hydro

Con...

- ▶ There is excellent wind potential in many area,
- ▶ Afghanistan solar radiation averages about 6.5 kWh per m² per day,
- ▶ 300 Sunny days per year,
- ▶ Biogas and geothermal can provide significant renewable energy for rural communities.

(Afghanistan Initial national Communication to the U.N.Framework Convention on Climate Change 2012)

Con...

- ▶ Significant amount of biomass are produced in the form of crop remainder and animal waste,
- ▶ These product is collected and used as unprocessed fuel,
- ▶ Active geothermal system are located in the main axis areas of the Hindu Kush which runs along the Heart fault system, up to the Wakhan corridor.

(Afghanistan Initial national Communication to the U.N.Framework Convention on Climate Change 2012)

Biodiversity

Analysis of recorded species record shows that there are:

- ▶ 118 to 147 species of mammals ,
- ▶ 472 to 510 birds,
- ▶ 92 to 112 reptiles,
- ▶ 6 to 8 amphibian ,
- ▶ 101 to 139 fish,
- ▶ 245 butterfly,
- ▶ 3500 to 4000 vascular plant species native to Afghanistan.

(Climate Change and Disaster Preparedness Working Group Final Thematic Report .)

Mustela erminea & Uncia uncia



Con...

The species composition of all ecoregions has significantly reduced through a combination of ,

- ▶ Overgrazing,
- ▶ Fuel collection,
- ▶ Exploitation of large herbivorous animals ,
- ▶ Conversion for extensive rain- fed agriculture.

(Climate Change and Disaster Preparedness Working Group Final Thematic Report .)

Over grazing



Destroyed pasture by extirpation of licorice radix



Green House Gas Inventory

Methodologies GHG Inventories:

- ▶ Green House Gas inventory were developed according to the methods & procedures in revised 1996 IPCC Guidelines ,
- ▶ National Study Team on GHG inventory development were formed ,
- ▶ 5 key sectors were identified and agreed upon for estimation the national GHG inventories.

Con...

Five key sectors are .

1. Energy : Total emission of all GHG from stationary & mobile energy activities (fuel combustion & fugitive fuel emission),
2. Industrial processes :emission within this sector comprise by-product or fugitive emission of GHG from industrial processes such as mineral products, chemical industries and metal production,

Con...

3. Agriculture : All anthropogenic emission from this sector except for fuel combustion and sewage emissions,
4. Land use change & forestry: Total emission from and removal by forest & land use change activities includes changes in forest & other woody biomass stocks, forest and grassland conversion and emissions from and removals by soil.

Con....

5. Waste: Total emissions from waste management ;solid waste disposal on land and waste water treatment,

The solvent and other product use , the sixth category prescribed in the guidelines ,have been excluded because of the data deficiencies in Afghanistan.

The total emission of GHGs for 2005 were 28759Gg CO₂ equivalents with no net removal.

(Afghanistan Initial national Communication to the U.N.Framework Convention on Climate Change 2012)

Brick Producing Factory



Con...

- ▶ Over the year Government of I.R.of Afghanistan has made many initiation towards creating national capabilities to promote the sustainable development path in Afghanistan,
- ▶ Steps taken in development of national policy plan and legal frameworks to address environmental challenges, disaster risk reduction, water security, food security, protection of forest & rangeland and biodiversity conservation .

Con...

Some main legal frameworks are as follows:

Afghanistan national Development Strategy, Environmental Law, National Environmental Action Plan, National Waste Management Policy, Environmental Impact Assessment Regulation, Clean Air regulation, National Disaster Management Plan, Water Law, Water Sector Policy, Power Sector Master Plan, Gas Sector Master Plan, Forest Law, Wild Animals protection and Hunting Regulation Law, Sustainable Rangeland Management Plan, Rangeland Law (draft), Ozone Regulation, Medicinal plants Protection & exploitation Procedure.

Activities have done on Natural Resources to Adapt Climate Change

- ▶ According to the remote sensing survey done in 2001 natural forest reduced to 1.34 million ha.,
- ▶ New survey in 2012 shows 1.7 million ha.,
- ▶ Increasing of forest areas means that forest protected and rehabilitated well,
- ▶ Aforestation, management of watersheds, creation of 2500 m³ check dam & 18077.5 km. streams to reduce surface water wastages.

Some important Proposed Adaptation projects on Climate Change

- ▶ Land and Water Management at the Watershed Level,
- ▶ Development of Horticulture,
- ▶ Improved terracing ,Agro-forestry and Agro-silvo Pastoral system,
- ▶ Rangeland Management,
- ▶ Improved Food Security,
- ▶ Creation of Off-form employment,

Con...

- ▶ Climate Related Research and Early Warning System,
- ▶ Data Format Preparation for GHG Reporting,
- ▶ Agriculture Research,
- ▶ Climate Change and Crop Insurance,
- ▶ Ecosystem Modeling,
- ▶ Technology Information Center,
- ▶ Rehabilitation of Forest for Mitigation of Gases Emission.

Thank you

Climate Change of Bangladesh: Adaptation Strategy and Implementation



Mohd. Nayeb Ali
Senior Assistant Secretary
Ministry of Water Resources

Md. Zakir Hossain
Senior Assistant Secretary
Ministry of Environment and Forests
Bangladesh

Impact of Climate Change



- Summer are becoming hotter (High temperature)
- Monsoon irregular with untimely rainfall
- Increased river flow and inundation during monsoon
- Heavy rainfall over short period causing water logging
- Increased frequency, intensity and recurrence of flood
- Crop failure due to drought
- Prolonged cold spell
- Salinity intrusion along the coast region

Adaptation Policy and Strategy of GOB



- National Adaptation Programmes of Action (NAPA) 2005 (Revised in 2009)
- Integrated Coastal Zone Management Plan 2005
- National Food Policy Plan of Action (2008-2015)
- Water Act 2013
- Bangladesh Climate Change Strategy and Action Plan (BCCSAP, 2009)
 - ✓ Food security, social protection and health
 - ✓ Comprehensive Disaster Management
 - ✓ Infrastructure
 - ✓ Mitigation and low carbon development
 - ✓ Research and knowledge management
 - ✓ Capacity and institutions

Bangladesh National Adaptation Programme of Action (BDNAPA)



- Prepared by the MoEF as a response to the decision CoP7 of the UNFCCC
- The basic approach to NAPA preparation was sustainable development goals and addressing environmental issue and natural resource management

Institutional Structure

- **National Environment Council**
 - Headed by Prime Minister
 - Strategic Guidance and oversight
 - **National Steering Committee on CC**
 - Headed by Minister, MoEF
 - Overall coordination and facilitation
 - **Climate Change Unit**
 - Ministry of Environment and Forests.
 - Coordination and Management
 - **Climate Change Cells in all ministries**
 - Plan and implement activities within their limit
- National Steering Committee on CC & Climate Change Unit perform
- CC Negotiation in association with Ministry of Foreign Affairs

NAPA Framework and Relationship with Development Goals

Climate and Related Elements	Critical Vulnerable Areas	Most Impacted Sectors
Temperature rise and Drought	• North-west	• Agriculture (crop, livestock, fisheries) • Water, Energy, Health
Sea Level Rise and Salinity Intrusion	• Coastal Area • Island	• Agriculture (crop, fisheries, livestock) • Water (water logging, drinking water) • Human settlement, Energy, Health
Floods	• Central Region • North East Region • Char land	• Agriculture (crop, fisheries, livestock) • Water (urban, industry) • Infrastructure • Human settlement • Health • Disaster • Energy
Cyclone and Storm	• Coastal and Marine Zone	• Marine Fishing • Infrastructure • Human settlement • Life and property
Drainage congestion	• Coastal Area • Urban • South West	• Water (Navigation) • Agriculture (crop)

Bangladesh Climate Change Trust Fund (BCCTF) Bangladesh Climate Change Resilience Fund(BCCRF)

- Government has created “Climate Change Trust Fund” during 2009 with allocation of 700 crore BDT. Till 2013-14 government has allocated 2700 crore BDT.
Total project approved under BCCTF: 208
The main objective is to implement the actions and programmes of NAPA & BCCSAP, 2009.
- BCCRF, signed May 2010, Managed by GoB, financed by Development Partners(WB, ADB, Swiss, UK etc)(about US\$ 170 million received)
Objective: Implementation of NAPA & BCCSAP
Total project approved under BCCRF: 198

The List of the Projects regarding CC

Sl. No.	Project Title	Type of Project	Implementing Agency	Total Cost
1	Reduction of climate change hazards through Coastal forestation with community participation.	Intervention	Forest Department (FD)	Full project: USD 23 million Project design: 100,000
2	Providing drinking water to coastal communities to combat enhanced salinity due to sea level rise.	Intervention	Department of Public Health Engineering (DPHE)	Full project: USD1.5 million Project design: USD 25,000
3	Capacity building for integrating Climate Change in planning, designing of infrastructure, conflict management and land-water zoning for water management institutions.	Capacity Building	Water Resource Planning Organization (WARPO)	USD2.0 million Project design: USD 25,000

The List of the Projects regarding CC

Sl. No.	Project Title	Type of Project	Implementing Agency	Total Cost
4	Climate change and adaptation information dissemination to vulnerable community for emergency preparedness measures and awareness raising on enhanced climatic disasters.	Awareness and Capacity Building	Ministry of Environment and Forest (MoEF)	Full project: USD7 million Project design: USD 50,000
5	Construction of flood shelter, and information and assistance centre to cope with enhanced recurrent floods in major floodplains.	Intervention	Disaster Management Bureau (DMB) & (LGED)	Full project: USD5 million Project design: USD: 50,000
6	Mainstreaming adaptation to climate change into policies and programmes in different sectors.	Capacity building	Department of Environment (DOE)	Full project: USD:1 million Designphase USD 25,000

The List of the Projects regarding CC

Sl. No.	Project Title	Type of Project	Implementing Agency	Total Cost
7	Inclusion of climate change issues in curriculum at secondary and tertiary educational institution.	Awareness raising	Board of Education	Full Project: USD 0.5 million Project design: USD 25,000
8	Enhancing resilience of urban infrastructure and industries to impacts of climate change.	Capacity building	Department of Environment (DOE)	Full project: USD 2 million Design phase: USD 25,000
9	Development of eco-specific adaptive knowledge (including indigenous knowledge) on adaptation to climate variability to enhance adaptive capacity for future climate change.	Intervention	NGO consortium	Full project: USD 5 million Design phase: USD 50,000

The List of the Projects regarding CC

Sl. No.	Project Title	Type of Project	Implementing Agency	Total Cost
10	Promotion of research on drought, flood and saline tolerant varieties of crops to facilitate adaptation in future.	Research	B a n g l a d e s Agricultural Research Council (BARC)	Full project: USD 5 million Design phase: USD 50,000
11	Promoting adaptation to coastal crop agriculture to combat increased salinity.	Intervention	B a n g l a d e s Agricultural Research Institute (BARI)	Full Project: USD:6.5 million Project design: USD 50,000
12	Adaptation to agriculture systems in areas prone to enhanced flash flooding– North East and Central Region.	Intervention	B a n g l a d e s Agricultural Research Institute (BARI)	Full project: USD6.5 million Project design: USD 50,000

The List of the Projects regarding CC

Sl. No.	Project Title	Type of Project	Primary Implementing Agency	Total Cost
13	Adaptation to fisheries in areas prone to enhanced flooding in North East and Central Region through adaptive and diversified fish culture practices.	Intervention	Department of Fisheries (DOF)	Full Project: USD4.5 million Project design: USD 50,000
14	Promoting adaptation to coastal fisheries through culture of salt tolerant fish special in coastal areas of Bangladesh	Intervention	Department of Fisheries (DoF)	Full project: USD 4 million Project design: USD 50,000
15	Exploring options for insurance to cope with enhanced climatic disasters.	Research	Department of Environment (DOE)	Full Project: USD0.2 million Projectdesign: USD 25,000

Lessons Learnt

- Bangladesh should take urgent steps to implement the projects listed in NAPA and BCCSAP to mobilize resources from LDCF Adaptation Fund and other bilateral and multilateral sources.
- Bangladesh needs sectoral preparation for utilization of international sources of funding including NAPs, NAMA.
- Strengthening negotiation process with parties for legally binding agreement
- Mobilization of resources through bilateral and multilateral arrangement

Recommendation for future action

Intervention Type Measures

1. Promoting adaptation to coastal crop agriculture and fisheries to combat increased salinity.
2. Adaptation to agriculture systems in areas prone to enhanced flash flooding in North East and Central Region.
3. Construction of flood shelter, and information and assistance centre to cope with enhanced recurrent floods in major floodplains
4. Reduction of climate change hazards through coastal afforestation with community participation.
5. Providing drinking water to coastal communities to combat enhanced salinity due to sea level rise.

Recommendation for future action

Facilitating Type Measures

1. Capacity building for integrating Climate Change in planning, designing of infrastructure, conflict management and land water zoning for water management institutions.
2. Exploring options for insurance to cope with enhanced climatic disasters.
3. Mainstreaming adaptation to climate change into policies and programmes in different sectors (focusing on disaster management, water, agriculture, health and industry).
4. Inclusion of climate change issues in curriculum at secondary and tertiary educational institution.
5. Promotion of research on drought, flood and saline tolerant varieties of crops to facilitate adaptation in future.

*Thank
You*



Implementation Experience of CCA strategy and institutional mechanism: lesson & recommendation

9th September, 2014, Colombo

Jigme Nidup & Dorji Dema
National Environment Commission
Bhutan



Presentation Outline

- ❖ Brief introduction
- ❖ Environment related Policies and laws
- ❖ Activities
- ❖ Way forward

Brief Introduction



- Bhutan's economy is strongly linked to water resources which are vital for many other sectors
- IPCC indicates that mountainous countries such as Bhutan are likely to be among the countries most vulnerable to the adverse impact of climate change

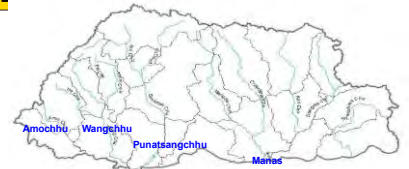
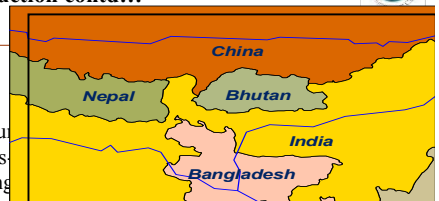
✓ The Bhutan Himalayas is known to have more than 677 Glaciers and 2,674 Glacial lakes and 25 of these lakes are potentially dangerous



Brief Introduction contd...



✓ Bhutan has four major river basins: Amo Chu, Wang Chu, Punatsang Chu and Drangme Chu Basins



Impacts of Climate Change-Bhutan



Most vulnerable sectors/communities:



- Heavy dependence on climate sensitive sectors
- Agriculture and hydropower sectors depend heavily on the monsoon and temperature change patterns
- Major share of Bhutan's revenue depends on income from hydropower
- ~70% of Bhutan's population depend on subsistence farming
- The rural poor will be hit hardest from any climate change impact ⁵

Current Vulnerabilities



- Glacial Lake Outburst Floods
 - due to temperature rise
- Land Degradation
 - Landslides, erosion due changes in weather patterns, high intensity rainfall, cyclones
- Flashfloods
 - Intense rainfall periods, cyclones



Current Vulnerabilities



- Droughts
 - Drying water sources due to temperature rise, longer intervals between rains
- Wind and Thunder storms
- Pests and diseases



Environment related Policies and laws



- **The Constitution of the Kingdom of Bhutan**
 - Article 1, section 12 - "The right over mineral resources, rivers, lakes and forests shall vest in the State and are the properties of the State, which shall be regulated by law".*
 - Article 5 Environment- mandates RGoB to protect, conserve, and improve the pristine environment; secure ecologically balanced sustainable development and ensure safe and healthy environment.*
- **The Water Act of Bhutan 2011**
 - Water resources are the Property of the State and right over water resources shall vest in the State;
 - The Royal Government as the public trustee of the nation's water resources shall ensure that water is protected, conserved and managed in accordance with the principles in this Act;

Environment related Policies and laws contd....



The Water Act of Bhutan 2011

- Every individual shall have access to safe, affordable and sufficient water for basic human needs.
- Promote payment for environmental services provided by water resources.
- No development activities shall be allowed within 100 feet buffer zone, measured from the determinable high flood level of either side.
- Provide incentives for exemplary initiatives leading to sustainable use of water resources, reduction of water wastage, rainwater harvesting, innovative projects and technologies.

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Environment related Policies and laws contd...



Bhutan Water Vision 2003

- Water is the most important natural, economic and life sustaining resource, must ensure to meet the increasing demand with adequate, safe and affordable water for present and future generations to enhance the quality of their lives and integrity of natural ecosystem.

Strategies

- To achieve the vision, water must be used and managed sustainably, efficiently and equitably while preserving the environment, social, cultural and economic values and uses of water

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Second National Communication 2011



Adaptation priorities for water sector and climate change related disaster

- Conduct comprehensive water resources assessment to improve understanding of water resource availability, the effects of climate change to develop appropriate adaptation measure
- Increase resilience to the impacts of climate change on water resources
- Water resources management through adoption and implementation of IWRM and efficiency by using river basin framework for planning
- Strengthening climate observation and network for early warning and forecasting of extreme events understanding climate change
- Mainstream climate change and water resources into national plans and programmes

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Adaptation Activities (NAPA Projects 2012)



1. Artificial lowering of Thorthormi lake- 5 meters in October 2012
2. Installation of Early Warning System on the Pho Chhu Basin- Automatic GLOF Early Warning System installed
3. Weather Forecasting System to Serve Farmers and Agriculture
4. Landslide Management & Flood prevention (pilot schemes in critical area)- sustainable land management projects and through Environment Friendly Road Construction (EFRC) techniques
5. Flood Protection of Downstream Industrial and Agricultural area
6. Rainwater Harvesting
7. GLOF Hazard Zoning (Pilot Scheme- Chamkhar Chu and Basin)
8. Promote Community-based Forest Fire Management and Prevention

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NAPA Project (GLOF Project)

*Reducing Climate Change-induced Risks and Vulnerabilities
from Glacial Lake Outburst Floods
in the Punakha-Wangdi and Chamkhar Valleys*

Three Components

1. Artificial lowering of water level in Thorthormi Lake
 2. Increase capacity for disaster risk management in affected valleys
 3. Installing Technical Early Warning System for glacial lake outburst floods
- Funded by LDCF, RGOB, UNDP, Austrian Development Agency and the WWF-Bhutan (USD 8.273 million)
 - Project period: 5 yrs (commencing 2008)

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Outcomes of the GLOF Project

Outcome 1: Improved national, regional, and local capacities to prevent climate change-induced GLOF disasters in the Punakha Wangdi and Chamkhar Valleys

- GLOF hazard zonation and mapping completed and identification of high risk zone and evacuation sites
 - Communities trained on Community based Disaster Risk Management (CBDRM)
 - Awareness on risk of GLOF and floods disseminated through media
- Department of Disaster Management, MoHCA



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Outcomes of the GLOF Project

Outcome 2: Reduced risks of a GLOF from Thorthormi Lake through an artificial lake level management system

- The level of Thorthormi lake was successfully lowered by 504 centimeters (target was 500 cm) and two subsidiary adjacent lakes to Thorthormi lake was reduced by 366cm, and 508cm
- Department of Geology and Mines, MoEA



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Outcomes of the GLOF Project

Outcome 3: Reduced human and material losses in vulnerable communities in the Punakha Wangdi Valley through GLOF early warnings

- Manually operated GLOF early warning system is operational
 - Automatic GLOF early warning system in the Punakha-Wangdi valley is operational since Sept '11
- Department of Hydro-Met Services, MoEA



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Outcomes of the GLOF Project



Outcome 4: Enhanced learning, evaluation and adaptive management

- Lessons learned from this project are captured and disseminated through Adaptive Learning Mechanism (ALM) and knowledge sharing with other GLOF prone areas

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Updating Bhutan's NAPA



Justification for Updating

- Full implementation of identified priorities have not occurred
- Other climate risks which were not in NAPA 2006 have emerged (cyclones, windstorms)
- Reconsider cost of identified projects (inflation, current socio-economic conditions)
- Infrastructure and population at risk increasing

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Proposed Projects in NAPA-II

www.nec.gov.bt



RANK	PROPOSED PROJECT	COST
1	Landslide Management and Flood Prevention	6.423
2	Disaster Risk Reduction and Management – planning disaster management interventions and providing emergency medical services to vulnerable communities	1.243
3	Enhancing National Capacity for Weather and Seasonal Forecasting in Bhutan	4.410
4	Application of Climate Resilient and Environment Friendly Road Construction (EFRC) Nationwide to the National Engineering Institutes	0.100
5	Community based Food Security and Climate Resilience	0.241
6	Flood Protection of Downstream Industrial Area	0.360
7	Rainwater Harvesting and Drought Adaptation	0.789
8	Community-based Forest Fire Management and Prevention	0.671
TOTAL		USD 14.237 million

Technology Need Assessment and Technology Action Plans for Climate Change Adaptation 2013



The potential technology options for water sectors in Bhutan

- Micro/Mini hydro
- Efficient irrigation methods
- Solar (rooftop PV)
- Water use efficiency methods
- Rainwater harvesting (for ground water recharge and runoff control)
- Reduction of chemical contamination
- Waste to energy
- Wind
- Rainwater harvesting roof top
- Biomass
- Soil erosion control measures
- Building impoundments

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Lessons and recommendations

- Lowering of artificial lake- altitude sickness, technology transfer, lack of technical expertise
- Being an LDC, no fund for locally adaptation activities
 - No adaptation mapping conducted
- Lack of data

- Regional cooperation need to be strengthened
- Coordination between the different sectors and support sectors working for climate change adaptation
- Mainstreaming adaptation to climate change into plans and policies
- Research should be conducted
- Capacity building

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Way forward

IWRM

- National Climate change strategy in pipeline
- Water regulation in pipeline
- Completed water resources inventory for the whole country.
- A National Integrated Water Resources Management Plan and River Basin Management Plan shall be formulated for coordinated development, management, conservation and efficient use of water resources within 2013-2018

- To adapt the AWDO Approach

- Define AWDO data requirement

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**THANK You
for
Your Attention**

Lessons learnt in Strategy Implementation on CCA in water Sector




HAWWA AGEELA & MAUMAN ABDUL RASHEED
MINISTRY OF ENVIRONMENT & ENERGY
REPUBLIC OF MALDIVES

Country Overview

The country	Geography	Demography and development
1190 islands, 26 natural atolls, 20 admin div.	Average size of island: 0.25 sq.km.	Population: 330,652 in 2012
194 inhabited & 105 resorts	Average elevation: 1.8 m	1/3 lives in capital Male'
1/3 less than 500	5% of world's reef area	
70% less than 1000		
3 islands < 5000		

Water Resources

- Groundwater is a scarce resource because of hydrology
- Annual average rainfall is more than 1900 mm (NAPA, 2006)
- Rainwater is widely used in the islands & accounts for more than 94 % use (MPND, 2006).
- In Male' & few islands desalinated water is supplied to households

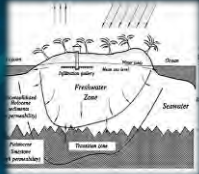


Water Sources

Surface freshwater is lacking except few wetland and swampy areas

Ground water: Thin layer of permeable aquifer → 1-2m below ground

Traditionally depended on shallow wells for potable and other purposes



What is expected for Maldives

Change in rainfall patterns

Flooding

Food security

Saltwater intrusion

Loss of vegetation

Loss of wetlands & water bodies

Degraded water quality

Waterborne diseases

Infrastructure damage

Groundwater pollution

National Adaptation Program of Action (NAPA)

- Was developed with support from GEF and UNDP
- It outlines 7 critical areas
 - Coastal zone management
 - Critical infrastructure
 - Tourism
 - Fisheries
 - Human health
 - Water
 - Agriculture and food security

All these areas contribute to overall sustainable development of the country

Comprehensive climate change policy framework is developed to address the challenges faced by climate change

What is the aim of MCCPF

- Foster & guide national plan of action to address current, short, medium & long term effect
- Scaling up the commitment of the government
- Incorporate climate change in every sector's development
- Strengthen the capacity of maldives to reduce current events
- Build and strengthen on existing policies


Policy Strategic Framework

- It is aim to achieve overall sustainability of maldives island.
- Consist of 2 components
 - Strategic component
 - Low emission development
 - Adaptation & opportunities
 - Building blocks
 - Technology transfer
 - Finance
 - Capacity development

Impacts of climate change


Wastewater disposal systems

- high groundwater contamination → from on-site sanitation




Tsunami, Sea swells & storms

- 2004 Indian Ocean tsunami → destroyed approximately 50% of rainwater tanks → rendered entire island populations without access to safe drinking water & severely degraded groundwater quality and soil fertility.
- Damage to water and sanitation infrastructure
- Contamination of groundwater



Water situation in the Islands

- In the outer islands, households obtain water from a range of sources:
 - local and imported bottled water
 - desalinated seawater using reverse osmosis plants
 - rainwater harvested from roofs and stored in household and community rainwater tanks, and groundwater.
- The choice depends on the season, the use, and household finances.
- The per capita household demand for potable water has generally been estimated at 10 liters per person per day (l/p/day).
- The total per capita demand for non-potable water (including bathing, washing clothes, and toilet flushing) is estimated at about 100 l/p/day to 120 l/p/day (Bangladesh Consultants, 2010a, b, c and d).
- A survey of 70 islands in 2010 reported that household groundwater is contaminated in most of the islands and not suitable for drinking (MEE, 2011).
- Piped water coverage in the outer islands remains low, with no more than 23 percent of the population serviced via piped connections in any atoll outside of Greater Male' (MEE, 2011).



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Climate Change Adaptation..

The Dry Season.

- Maldives has two distinct seasons; Dry season (northeast monsoon) and wet season (Southwest monsoon)
- The dry season usually befalls on to the beginning of the year, extending until March/April.
- May to November /December is the wet season

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Climate Change Adaptation

Water Shortage During the Dry-Season

Water scarcity during dry season is inevitable for the islands without piped network or well established back-up community storage.

Water shortage of these islands are being attended by the National Disaster Management center (NDMC) since 2005.

As dry season falls, NDMC transports potable water from the Capital Male' to the Islands.

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Climate Change Adaptation

Challenges faced in catering water demand of the Dry Season.

Cost of Transportation of Extremely High.

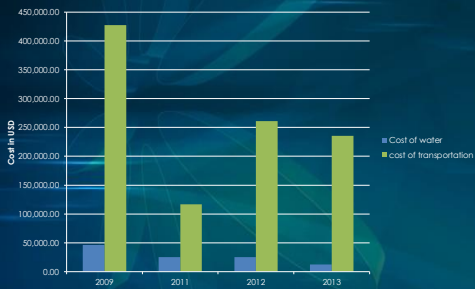


Mode of transportation is not always available

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No:	Year	No of Islands	Amount of water Supplied in Tons	Cost for water USD	Cost for transportation USD	Total Cost(USD)
1	2005	91	2728			159,223.09
2	2006	86	2805			145,525.29
3	2007	82	2694			131,031.13
4	2008	74	2088			101,556.42
5	2009	88	7469.01	46,504.60	427,585.69	474,090.29
6	2010	0	0	0		0.00
7	2011	85	3920	25,418.29	116,760.05	142,178.34
8	2012	84	2745.24	25,035.60	261,040.21	286,075.81
9	2013	28	1225	12,451.13	235,542.19	247,993.32
Total				109,409.63	1,040,928.13	1,687,673.69

Cost of "emergency water supply"



Government's Strategy to overcome the dry season impacts!

Continue establishment of RO plants with piped networks for Islands with larger population (above 2000)

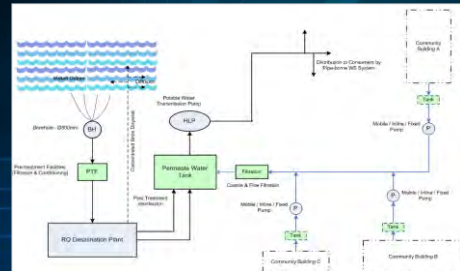
Implementation of community storage tanks with Tap bay to cater for the shortage of water during the dry season (Islands with population less than 1000)



Innovative solutions for sustainable water supply

Establishment of a sustainable freshwater supply system that incorporates and integrates rainwater harvesting and desalination technology with the use of renewable energy sources, known as the **IWRM** (Integrated water resources Management) approach.

IWRM



IWRM concept used in Adh.Mahibadhoo, Maldives

Benefits of IWRM


- Establishment of a sustainable freshwater supply system that incorporates and integrates rainwater harvesting and desalination technology with the use of renewable energy sources
- Improvement of groundwater quality by limiting over extraction , artificial groundwater recharge and better integration between freshwater and wastewater management
- Incorporation of renewable energy technologies
- Completed 01 project, 08 projects on going.

Ground Aquifer Recharge options


- Re routing run-off from roofs and other storm water to ground aquifer by means of drains, soak-ways or other recharge options.
- Aquifer recharge with treated waste effluent.

Issues & Challenges

Costly to provide, monitor and manage services effectively for all islands due to dispersed population.



Cost-recovery and sustainability of services prove to be challenging – government has to provide subsidies.

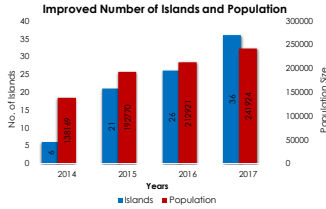


Lack of institutional and financial capacity → establishment, operation & management of water and sewerage services.

Lack of regulatory framework, guidelines and standards

Water sector Targets

Improved Number of Islands and Population



Year	Islands	Population
2014	4	101,016
2015	21	162,976
2016	26	210,820
2017	36	241,920

Water Supply Network

2014 (06 Islands)

Completed Water Supply Network (06 Islands, Population-138,169)

2015 (US\$ 78m, 15 Islands)

AF (US\$ 10m, 03 Islands, Population-8742)

USAID (US\$ 7m, 01 Island, Population-4645)

GEF (US\$ 1.2m, 01 Island, Population-1785)

PSIP (US\$ 29.2m, 08 Islands, Population-37788)

CCTF (US\$ 78,000, 01 Island, Population-943)

CSR (01 Island, Population-679)

2017 (US\$ 26.5m, 10 Islands)

OFID Ph II (US\$: 26.5m, 10 Islands, Population-29,000)

2016 (US\$ 14.5m, 05 Islands)

OFID Ph I (US\$ 6.5m, 04 Islands, Population-8225)

Kuwait Fund (US\$ 8m , 01 Island, Population-11926)

Water Resources of Pakistan: Issues and Adaptation Strategies



Dr. Muhammad Zia ur Rahmann Hashmi
Senior Scientific Officer
Global Change Impact Studies Centre (GCISC)
Islamabad, Pakistan

Outline

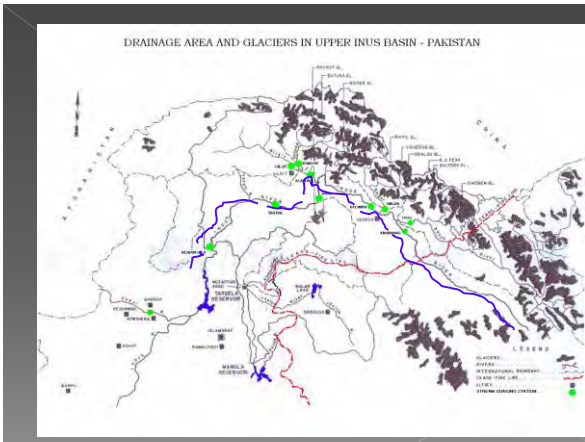
- Water resources of Pakistan
- Issues related to Water Resources of Pakistan
- Government Strategies
- Summary

2

Water Resources of Pakistan

3





Principal Rivers of the Himalayan Region			
River Name	Length (km)	Mean Discharge (m ³ /s)	Glacier Melt in River Flow (%)
Yangtze	6,300	34,000	>4
Brahmaputra	2,948	19,824	12.3
Ganges	2,057	18,691	9.1
Irrawaddy	2,170	13,565	Small
Mekong	4,600	11,048	6.6
Indus	2,900	5,533	44.8
Salween	2,800	1,494	8.8
Yellow	5,464	1,365	1.3
Tarim	2,030	146	40.2

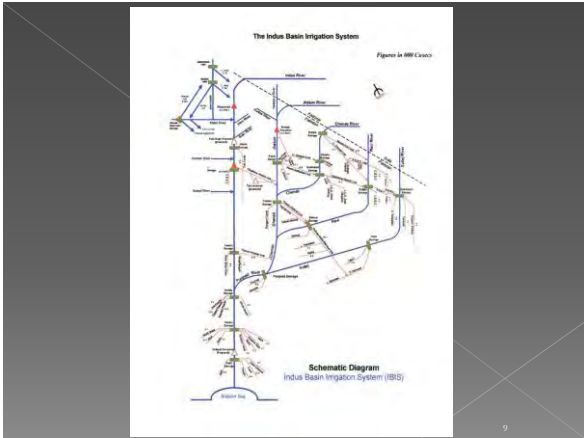
IRRIGATION SYSTEM IN PAKISTAN

KEY FACTS

No. of major Reservoirs:	3
No. of Barrages:	16
No. of Headworks:	2
No. of Inter-link Canals:	12
No. of Canal Systems:	44
No. of Watercourses:	107,000
Length of Canals:	56,073 km
Length of Watercourses:	1.6 million km
Average Canal Water Diversions:	104.7 MAF
Groundwater Abstractions:	41.6 MAF
No. of Tubewells:	> 550,000
Irrigated Area:	36 million acres
Average Escapage to the Sea:	39.4 MAF

Historical perspective: It began in 1859 with the completion of the Upper Bari Doab Canal (UBDC) from Madhopur Headworks (now in India) on Ravi River. Until that time, irrigation was undertaken through a network of inundation canals, which were functional only during periods of high river flow.





Trans-boundary Water Issues

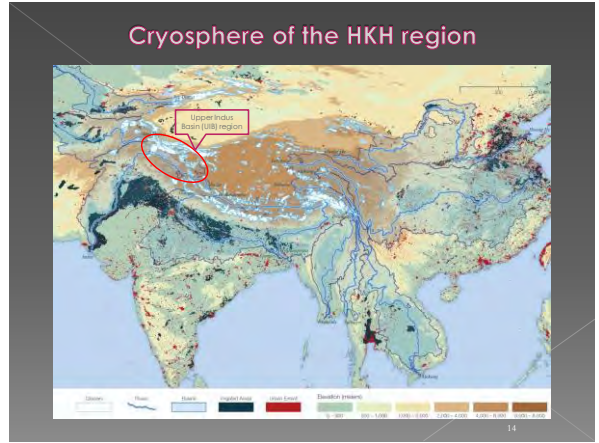
- ISSUE - 1** No environmental flows were allocated for Eastern rivers (Ravi, Bias and Sutlej) under Indus Water Treaty where most fertile land is located
- ISSUE - 2** Diversion of water from western rivers to feed the area deprived of water resulted in water logging
- ISSUE - 3** Dumping of city sewerage & industrial waste in Eastern Rivers causing death of flora and fauna and now is source of several diseases
- ISSUE - 4** More than 50% of the watershed lies outside Pakistan's territory where no intervention are possible for Pakistan
- ISSUE - 5** Construction of Hydro Power Projects on 3 Western rivers which are not in line with IWT's provisions
- ISSUE-6** Century old contagious irrigation system results in considerable wastage of water in conveyance.

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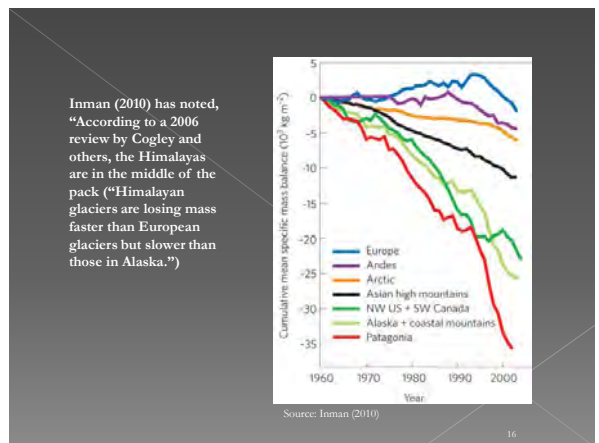
Climate Change

- > **Rapid Melting of HKH glaciers and its Implications for:**
 - > Average Annual River Flows
 - > Pattern of Seasonal Flows
 - > Inter Annual Variability of Flows
 - > Increased number of GLOF events
- > **Increase in Frequency and Intensity of Extreme Precipitation Events and its Implication for Floods and Droughts**
- > **Sea-level Rise and its Implications**

Climate Change Implications for Glaciers of Pakistan



- ### Some facts related to cryosphere of UIB
- Total Glacial Area.... = 15061.74 sq.km
 - Est. total Ice Reserves..... = 2,174 Km³
 - Total number of Glaciers..... = 11,413
 - Largest glacier area.... = 925.93 Km²
- Source: ICIMOD (2011)



HKH Glaciers under changing climate

Source	Finding
World Glacier Monitoring Service	<i>Measurements taken over the last century clearly reveal a general shrinkage of mountain glaciers on a global scale</i>
Mason Inman (2010) In Nature reports-climate change	<i>"The remote glaciers of the Himalayan mountains have been a subject of much controversy, yet little research" (Out of about 12000 to 15000 glaciers in Himalaya and around 5000 in Karakorum, very few have been measured on the ground to see if they are losing or gaining mass) "It is pretty clear that Himalayan glaciers have been losing mass, with markedly greater loss in the past decade than earlier" Graham Cogley, Geographer, Trent University Ontario</i>
Dirk Scherler et al. (2011) In Nature Geoscience (Effect of Debris cover)	Out of 42 studied glaciers in Karakoram region, 58% advancing/stable and 42% retreating. In all other regions (Himalaya, Hindukush, West Kunlun Shan), the studied glaciers are mostly retreating. Study has found that the debris cover has a significant influence on glacier terminus dynamics.

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Karakoram cryosphere under changing climate "Karakoram Anomaly"

Source	Finding
Hewitt, 2005 Bishop et al., 2008 Hewitt, 2011 Copland et al., 2011 Dirk Scherler et al. (2011) Gardelle et al., 2012 Sarikaya et al., 2012 Kääb et al., 2012 Janes and Bush 2012 Wiltshire, 2013	→ Stable/slightly advancing glaciers
Cogley (2012) in Nature Geoscience	"No ice lost in the Karakoram"

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Analysis of Climate data supporting the slow response of Karakoram Glaciers to changing climate

Source	Finding
Elisa Palazzi (ISAC CNR) et al. (2013)	Analysis of last ~60 years of northern Pakistan data from Pakistan Met Deptt show: <ul style="list-style-type: none"> • Decreasing trend in JJAS minimum temperatures • Increasing trend in DJFMA maximum temperatures • Increasing trend in DJFMA precipitation
Bocchiola and Diolaiuti (2013) (Italians)	PMD's "hill stations" monthly data for 1980–2009 in the upper Karakoram, Northern Pakistan: "Slightly decreased Summer temperatures, and increased Winter Prec., possibly leading to increasing snow covered area at thaw"

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Projected Implications on Indus River Flows due to Melting of HKH Glaciers

(Reported by Some Recent Studies)

- World Bank (2006)

Western Himalayan glaciers will retreat for the next 50 years causing increase of Indus River flows, then the glacier reservoirs will be empty, resulting in decrease of flows by up to 30% to 40% over the subsequent fifty years.

- IPCC AR4 (2007)

Glacier melt in the Himalayas is projected to increase flooding within next two to three decades. This will be followed by decreased river flows as the glaciers recede.

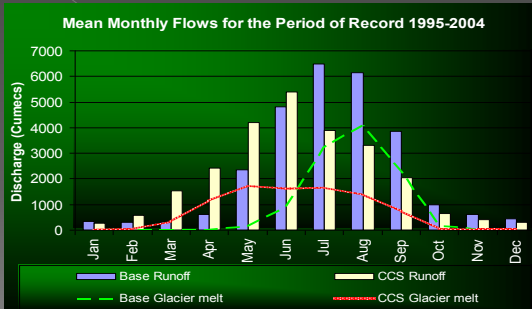
- Immerzeel et al. (2009) conclude

Even if the glaciers vanish completely, Indus river flows will only decrease by about 15 per cent overall, and very little or no change is expected for the dry-season

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Impact of Climate Change and Glacier retreat on UIB Flows

Assumed Climate Change Scenario (CCS):
 Δ Temp: +3°C, Δ Glacier Area: -50%



- Main Results:
1. Annual flows reduced by 15%
 2. Intra-Annual flow pattern considerably changed

Water Resources Adaptation Strategies of Govt. of Pakistan

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Ongoing and Planned Actions of GoP

- Addition of reservoir capacity on Indus River System (IRS) by construction of few large hydropower dams by 2030
- Local rainwater harvesting
- Adoption of stringent demand management and efficiency improvement measures in all water-use sectors particularly in the supply, distribution and use of irrigation water
- Re-use of marginal quality irrigation effluent
- Development of capacity to deal with disasters such as floods, droughts and cyclones

[Extracts from Planning Commission, Govt. of Pakistan, Task Force on Climate Change (TFCC) report published in 2010]

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Climate Change Adaptation-GoP Policy measures related to Water Resources

- Ensure early rehabilitation and remodelling of existing irrigation infrastructure in the wake of climate change
- Encourage introduction of more efficient irrigation techniques
- Integrated water resources management
- Ensure to safe guard Pakistan's rights on trans-boundary water inflows according to international norms and conventions
- Protect HKH glaciers by declaring them as 'protected areas'
- Enhance national capacity by strengthening hydro-meteorological networks and learning new Rs/GIS techniques for glacier monitoring
- Awareness raising

[Extracts from Pakistan's 'Climate Change Policy' published by Ministry of Climate Change (Parent ministry of GCISC), Govt. of Pakistan, in 2011]

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Some Important Govt Actions

- ◉ Proper lining of the canal system (According to a WAPDA Report more than 5 MAF of irrigation could be saved by lining of minor canals and addition 3.6MAF could be saved by improvement of water courses)
- ◉ Government of the Punjab has introduced modern telemetry system to check and control water theft by the farmers
- ◉ The Medium Term Development Framework (MTDF) 2005-10 proposes a water conservation strategy
 - > adoption of integrated approach, rational resource use, and the introduction of water efficient techniques
 - > improving performance and utilization of local systems through better planning, management and community participation

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Summary

- ◉ Pakistan is a water resources rich country
- ◉ There are many water resources related challenges especially Climate Change
- ◉ Govt. of Pakistan is well aware and striving
- ◉ A number of Adaptation strategies has been planned
- ◉ Each household of Pakistan should contribute

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Thank you



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Implementation Experience of CCAS and Institutional Mechanism

Sri Lanka



Outline of the Presentation

- Background
- Vulnerability to Climate Change
- National Climate Change Policy of Sri Lanka
- Vulnerability Assessments and Profiles
- National Climate Change Adaptation Strategy
- Implementation of Climate Change Adaptation Strategy
- Institutional Mechanism
- Recommendations

Background

- **United Nations Framework Convention on Climate Change - UNFCCC**
 - Sri Lanka signature to UNFCCC on 10th June 1992
 - Sri Lanka ratified the UNFCCC on 23rd November 1993
 - UNFCCC entered into force on 21st March 1994
- **Kyoto Protocol – KP**
 - KP was adopted on 11th December 1997
 - Sri Lanka ratified the KP on 03rd September 2002
 - KP entered into force on 16th February 2005

Vulnerability to Climate Change

Sri Lanka's contribution to global warming is negligible. However, being a tropical Island, Sri Lanka is highly vulnerable to -- adverse impacts of CC;

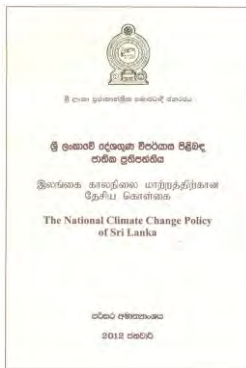
- Flash flood & landslides :-: intensive rainfalls
- Long droughts / less rains :-: monsoon change
- Sea level rise :-: melting glaciers & ice caps

-- Geographically;

- Wet zone low lands for floods
- Dry zone for droughts
- Coastal zone for sea-level-rise
- Central highlands for land slides, droughts

National Climate Change Policy of Sri Lanka

- **Vision** - A future where climate change will have no adverse consequences on Sri Lanka
- **Mission** - Addressing climate change issues locally while engaging in the global context
- **Goal** - Adaptation to and mitigation of climate change impacts within the framework of sustainable development



National Climate Change Policy of Sri Lanka

Objectives

1. Sensitize and make aware the communities periodically on the country's vulnerability to climate change.
2. Take adaptive measures to avoid/minimize adverse impacts of climate change to the people, their livelihoods and ecosystems.
3. Mitigate greenhouse gas emissions in the path of sustainable development
4. Promote sustainable consumption and production.
5. Enhance knowledge on the multifaceted issues related to climate change in the society and build their capacity to make prudent choices in decision making.
6. Develop the country's capacity to address the impacts of climate change effectively and efficiently.
7. Mainstream and integrate climate change issues in the national development process.

National Climate Change Policy of Sri Lanka

Guiding Principles

1. Climate change possesses an immediate and potentially irreversible threat to the life on earth and timely action is necessary to reduce vulnerabilities and build resilience in the country.
2. Steps taken to address climate change shall be environmentally sound, nationally appropriate, socially acceptable, and economically viable.
3. Sustainable consumption and production can significantly address
4. The current and future challenges of climate change.
5. Ecosystems stability is ensured aiming at poverty eradication and Sustainable Human Development.
6. A shared vision coupled with a shared responsibility of all the citizens is a necessity to effectively address the climate change problems/issues.
7. Precautionary principles shall be followed in the absence of scientific based evidences in decision making

National Climate Change Policy of Sri Lanka

Policy Statements

1. Vulnerability	Assessments, addressing the vulnerability, disaster mgt., health impacts
2. Adaptation	Food security, water resources and biodiversity, human settlement, Land use planning, Infrastructure designing, Coastal resources management
3. Mitigation	Energy, Transport, Industry, Waste Mgt., Agriculture and Livestock
4. SCP	Responsible use of natural resources and BD, Environment friendly consumption and lifestyles
5. Knowledge Management	Education, Awareness creation and Capacity building; Cooperation and Partnerships
6. General Statements	Institutional coordination, R&D, Technology transfer, Legal and Regulatory framework; Market and Non market based mechanisms; Resource mobilization

Vulnerability Assessments and Profiles

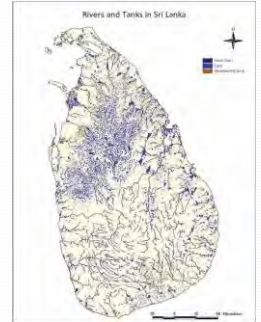
Sectors assessed

- Agriculture and Fisheries
- **Water sector**
- Health sector
- Biodiversity and Ecosystem Services
- Urban Development, Human Settlements and Economic Infrastructure

Vulnerability Mapping of the Water Sector

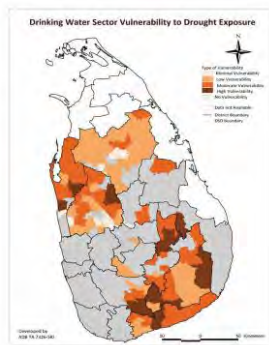
Distribution of rivers and tanks (including those abandoned)

- A network of 103 major river basins - amounting to total collective length of about 4,560 km covers an area of 59,245 km² including the river basins—which are the main source of natural inland surface waters.
- Overall, man-made water bodies include 309 irrigation reservoirs that irrigate over 80ha each, and a further 18,000 minor irrigation reservoirs, of which about 12,000 are currently in use



Drinking Water Vulnerability to Drought Exposure

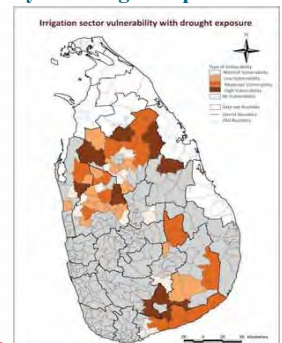
- Over 2 million people live in areas vulnerable to drought
- Over 70% of this population uses groundwater as the primary source of drinking water



Note: North and Eastern Provinces not covered

Irrigation Sector Vulnerability to Drought Exposure

- 9 DS Divisions (DSDs) appear to be highly vulnerable These DSDs have:
 - 2,375 tanks covering a total area of 240 km²
 - total population of 448,440 people, of whom nearly 25% are below the poverty line
 - about 97,570 people engaged in jobs related to agriculture

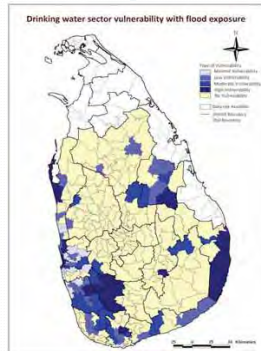


Note: North and Eastern Provinces not covered

Drinking Water Vulnerability to Flood Exposure

- 26 DSDs emerge as highly vulnerable. These DSDs have:
 - a population of 1.84 million
 - 412,886 housing units
 - 364,364 people below the poverty line
- These highly vulnerable DSDs have
 - 53.4% of the population depend on groundwater (i.e. 48% depend on either protected/unprotected wells and 5% depend on tube wells)
 - only 34% of the population have access to pipe-borne water
 - 11% of households depend on rivers, streams, and tanks as their primary source of water
 - only 17.2% of households have their primary source of water within their own premises

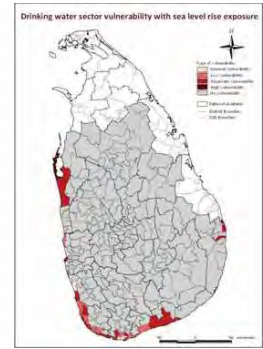
Note: North and Eastern Provinces not covered



Drinking Water Vulnerability to Sea level rise

- The drinking water in the north-west and the southern regions emerge as the most vulnerable to sea level rise in this analysis.
- Kalpitiya DSD in the Puttalam District displays the highest vulnerability. It has:
 - A population of 81,780 of which 20% of persons are below the poverty line
 - A high dependence of 86% on various forms of groundwater as their primary source of water

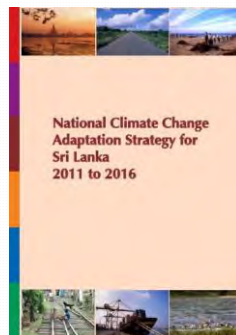
Note: North and Eastern Provinces not covered



National Climate Change Adaptation Strategy for Sri Lanka (2011-2016)

Five Strategic Thrust Areas:

- Mainstream climate change adaptation into national planning and development
- Enable Climate Resilient and Healthy Human Settlements
- Minimize climate change impacts on food security
- Improve climate resilience in key economic drivers
- Safeguard natural resources and biodiversity from climate change impacts



Water Sector related Recommendations in the NCCAS

- The main thematic areas that deal directly with water under the Strategic Thrusts are to:
 - Ensure adequate quality and quantity of water for settlements
 - Ensure adequate water availability for agriculture
 - Ensure adequate quality and quantity of water for human wellbeing and ecosystem services
 - Enhance climate change resilience of natural inland wetlands and associated species
 - Information, education and communication on water related issues
- Several key adaptation measures were identified under each of these strategic thrust areas

Implementation of Climate Change Adaptation Strategy

- Implementation of National Climate Change Adaptation Plan (NAP)
- Implementation of climate change adaptation projects/Programs

Implementation of National Climate Change Adaptation Plan (NAP)

Sri Lanka is currently in the process of preparing NAPs on;

1. Food security : agriculture, livestock and fisheries
2. Health and diseases
3. Water resources
4. Coastal and marine resources
5. Ecosystems and biodiversity: forestry, wildlife
6. Human settlements and infrastructure
7. Industry energy and transportation
8. Tourism and recreation
9. Export development sector
10. Energy security and livelihoods

Implementation of climate change adaptation projects

1. The Project on addressing Climate Change Impacts on marginalized Agricultural Communities living in the Mahaweli River Basin of Sri Lanka

Adaptation Fund /WFP

Executing Agencies:Ministry of Environment & Renewable Energy in coordination with the Ministry of Agriculture and Ministry of Agrarian Services and Wildlife

Objective

Build diversified and resilient livelihoods for marginalized farming communities in the Mahaweli River Basin through effective management of land and water resources.

Components

1. Develop household food security and build resilient livelihoods for rain-fed farming households.
2. Build institutional capacity in village, local and regional service delivery to reduce risks associated with climate induced rainfall variability.

Implementation of climate change adaptation projects

2. Project on Strengthening the Resilience of Post Conflict Recovery and Development to Climate Change Risk in Sri Lanka

Special Climate Change Fund /UNDP

Executing Agency:Ministry of Economic Development

Objective

To increase the resilience of communities to climate change induced hazards through integration of climate smart policies and actions in to development planning and budgeting.

Components

1. Enhancing climate change resilient development planning at district and sub district levels
2. Increasing capacity in key rural development programmes and related sectors to implement climate change adaptation measures
3. Implementing climate resilient village economic development plans in vulnerable districts

Implementation of climate change adaptation projects

3. Disaster Risk Management Development Policy including Improving Climate Resilience Programme

World Bank

Implementing Agencies: Ministry of Finance and Planning /
Ministry of Water Resources and Management

Objective

The Project objective is to enhance the capacity of GoSL to be more resilient to the impacts of natural disasters.

Components of Improving Climate Resilience Programme

1. Development of Basin Investment Plans, to improve the understanding of climate risk and develop mitigation interventions
2. Building Climate Resilience of infrastructure, to implement urgent climate risk mitigation investments

Implementation of climate change adaptation projects

4. Technology Need Assessment

UNEP/GEF

Executing Agency : Ministry of Environment and Renewable Energy

Technologies Identified for;

Adaptation	Mitigation
• Food	Energy
• Health	Industry
• Biodiversity	Transport
• Coastal	
• Water	

Technology Identification -> Technology Prioritization -> Barrier Analysis -> Enabling Framework -> technology action plans -> Project Idea development

contd.. Technology Need Assessment

Technology identified for Water Sector

Technology	Project Idea
1. Restoration/ Rehabilitation of Minor Tank net works	Rehabilitation/Restoration and maintenance of minor tank network (cascade) systems in the dry zone of Sri Lanka as an adaptation strategy for climate change
2. Rainwater harvesting from rooftops for drinking and household uses	Promote roof top rainwater harvesting technology, as an adaptation measure for climate change
3. Boreholes/tube wells as a drought intervention for domestic water supply	Promote measures for sustainability of boreholes as an adaptation method for climate change
4. Multiple technologies	Improve availability of drinking and irrigation water for the dry zone of Sri Lanka as an adaptation measure for climate change

contd.. Technology Need Assessment

The pilot project on roof top rainwater harvesting technology as an adaptation measure, identified under the water sector

The project targets in two hazard-prone villages in Medawachchiya divisional secretary divisions in the Anuradhapura District.

Installation of 30 rainwater harvesting units in Kodyabendawewa Village - 21 households

Gurukandegama Village - 69 households

Institutional Mechanism

- Climate Change Secretariat, ME&RE-NFP
- Inter-Agency committee on Climate Change
- National Expert Committee on Climate Change Adaptation
- National Expert Committee on Climate Change Mitigation

Recommendations

- Climate Change Policy and Adaptation Strategy has to be incorporated to other sectoral policies and strategies and development plans
- An institutional framework for Climate Change should be strengthen
- Vulnerable assessment should be conducted in the North and East Provinces
- Existing vulnerable profiles should be updated
- Vulnerability should be assessed for the central highlands (103 rivers originated, hydro power generation, unique ecosystems / world heritage site, one of commercial crops (tea) cultivated, vegetable cultivation, highly landslide prone, etc....)

Recommendations

- Capacity in every nook and corner should be developed (personal and institutional)
- Awareness should be raised among all the strata of the society
- Research and Development should be conducted
- Data sharing mechanism and information flow in both ways (Bottom-up, Top-down) needed

Thank you

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Annex VII

Group work:

South Asia Regional Work-shop on lessons learnt in strategy implementation on climate adaptation in the water sector

Technical session 4: Participatory
session



- Split up into 2 groups (max. 8 participants).
- Choose a rapporteur!
- You will be given 4 questions
- You have 120 minutes time
- Discuss the questions and complete the power-point template
- At the end of the session, each group will present results

Question 1: Identify current adaptation planning and practices related to water resources including IWRM plans, plans, policies and strategies?

Identify and name the initiatives at national level including which country these are located

--

Which regional initiatives are relevant to adaptation planning in South Asia?

--

Question 2: What are the lessons learned (good practices, gaps and needs) from ongoing adaptation initiatives in your country, sector and region level? What are the major gaps in capacity.

Lessons learnt

--

Major gaps/barriers

--

Question 3: In your sector/country, what are the key opportunities and key challenges to integrate NAPs into the national development processes?

Identify and name opportunities
Identify and name challenges

Topic 2: Scoping out adaptation options

Q4. Looking at the printout of the NAP poster, identify which activities are relevant in your sector to start NAP process

Country	Sector	Activity

Group I

Question 1: Identify current adaptation planning and practices related to water resources including IWRM plans, plans, policies and strategies?

Identify and name the initiatives at national level including which country these are located

*Water Act of Bhutan-2011, Water Act of Bangladesh 2013,
NAPA - Bhutan, Bangladesh, Maldives
BCCSAP – Bangladesh 2009
NCCP 2012- Sri Lanka & Pakistan
MCCPF, Maldives
NCCAS 2010-Sri Lanka
TNA- Sri Lanka, Bhutan
BCCTF & BCCRF- Bangladesh
National Rainwater Harvesting Policy and strategy , Sri Lanka & Bhutan
National Policy for Rural Water supply and sanitation , Sri Lanka & Bhutan
National policy on protection and conservation of water resources, catchments and reservoirs
Environmental protection and preservation act , Maldives, Sri Lanka, Bhutan & Bangladesh*

Question 1: Identify current adaptation planning and practices related to water resources including IWRM plans, plans, policies and strategies?

Which regional initiatives are relevant to adaptation planning in South Asia?

*SACEP
SACOSAN initiative
GWP
South Asia water Partnership Initiation
South Asia SEA's Programmes*

Question 2: What are the lessons learned (good practices, gaps and needs) from ongoing adaptation initiatives in your country, sector and region level? What are the major gaps in capacity.

Lessons learnt

*-Engage all stake holders while formulating policies strategies, plans and also projects.
-Mobilization of resources through bilateral and multilateral arrangement. (Green Climate Fund, Adaptation Fund , SCCF, GEF etc)
- Training, Seminars and workshops national and regional level.
-National policy , strategies and Action plans provide instruments to support the adaptation initiatives
-Accountability of implementation and monitoring should be within one entity*

Question 2: What are the lessons learned (good practices, gaps and needs) from ongoing adaptation initiatives in your country, sector and region level? What are the major gaps in capacity.

Major gaps/ Barries
<p><u>Barriers</u></p> <p>Geography and topography</p> <p>Lack of sectoral cooperation</p> <p>Lack of capacity within the key sectors</p> <p>Lack of awareness at all levels</p> <p>Information gap, database</p> <p>Need of adaptation mapping</p> <p>Lack of fund for locally adaptation activities</p> <p>No regional weather forecasting centres</p> <p>Lack of community participation</p>

Question 3: In your sector/country, what are the key opportunities and key challenges to integrate NAPs into the national development processes?

Identify and name opportunities
<p>National Sustainable Development Strategy & MDG , Bangladesh, SriLanka, Bhutan, Pakistan and Maldives</p> <p>National development policy framework (Mahinda-Chinthana)- Green lanka programme , Sri Lanka</p> <p>Five year plan , Bangladesh , Bhutan</p> <p>Vision 2020, 2021</p> <p>Carbon Neutral by 2020 (Vision 2020, Maldives)</p>

Topic 2: Scoping out adaptation options

Question 3: In your sector/country, what are the key opportunities and key challenges to integrate NAPs into the national development processes?

Identify and name challenges
<p>Financing</p> <p>Lack of awareness and capacity regarding CAP to national policy makers</p> <p>Absence of institution to take lead role</p> <p>National and sectoral Priorities</p> <p>Political and social influences</p> <p>Lack of cooperation among the stakeholders</p> <p>No proper monitoring and evaluation mechanisms</p>

Q4. Looking at the printout of the NAP poster, identify which activities are relevant in your sector to start NAP process

Country	Sector	Activity
Maldives, Bhutan , Bangladesh, Afghanistan ,Pakistan	Water	<ol style="list-style-type: none"> 1. Briefing of NAP Process 2. National Vision and Mandate for NAPS 3. Synergy between development and adaption objectives, policies, plans and programmes 4. Building Institutional and technical capacity 5. Appraisal of Adaptation options

Q4. Looking at the printout of the NAP poster, identify which activities are relevant in your sector to start NAP process

Country	Sector	Activity
Sri Lanka	Water	NAP process initiated, currently stocktaking ongoing and need to synthesize of available knowledge on impacts vulnerability and adaptation capacity gap analysis and barrier analysis Element A: 3,4 Element B: 1 to 5

Q4. Looking at the printout of the NAP poster, identify which activities are relevant in your sector to start NAP process

Country	Sector	Activity
Pakistan	Water Resources Energy Desert and drylands	Element A: 1 & 2

Group II

Question 1: Identify current adaptation planning and practices related to water resources including IWRM plans, plans, policies and strategies?

Afghanistan

National level initiatives

- National development strategy (2008)
- National Action Program for adaptation
- Environment law 2006
- Water sector law 2009
- Procedure for community based natural resource management
- Water sector policy
- Regulation framework for water beneficiary association
- Policy and Strategy for natural resource management

Regional initiatives relevant to South Asia

- CACEP

Bhutan

National level initiatives

1. Installation of Early Warning System on the Pho Chhu Basin- Automatic GLOF Early Warning System installed in case of Bhutan
2. Weather Forecasting System to Serve Farmers and Agriculture-Bhutan
3. Landslide Management & Flood prevention (pilot schemes in critical- area)- sustainable land management projects and through Environment Friendly Road Construction (EFRC) techniques- Bhutan,
4. Flood Protection of Downstream Industrial and Agricultural area- Bhutan
5. Rainwater Harvesting and drought adaptation- Bhutan
6. GLOF Hazard Zoning (Pilot Scheme- Chamkhar Chu and Basin)- Bhutan
7. Promote Community-based Forest Fire Management and Prevention- Bhutan
8. Disaster Risk Reduction and Management – planning disaster management interventions and providing emergency medical services to vulnerable communities- Bhutan

Regional initiatives relevant to South Asia

- SACEP, SAARC, BIMSTEC

Pakistan

National level initiatives

- First Climate change Policy 2011.
- New storage dams,
- New improved forecasting system
- Early warning system for river floods and GLOFS
- Improvement of irrigation network efficiency
- Introduction of high efficiency irrigation systems

Regional initiatives relevant to South Asia

- SACEP, SAARC, Indus Water Treaty (IWT), Indus Water Commission

Bangladesh

National level initiatives

- Water Act 2013
- NAPA 2005 Updated 2009
- BCCSAP 2009

Regional initiatives relevant to South Asia

SACEP, SAARC, BIMSTEC, Ganga Water Sharing Treaty between India and Bangladesh

Maldives

National level initiatives

- Establish RO plants with piped network (population <2000)
- Implement community storage tanks (population >1000)
- Establishment of fresh water supply system that incorporate and integrates rain water harvesting and desalination technology
- Right now we don't have a water adaptation strategy
- Water Act (draft) have been sent to Attorney General's Office for comment

Regional initiatives relevant to South Asia

SACEP, SAARC,

Maldives

National level initiatives

- Establish RO plants with piped network (population <2000)
- Implement community storage tanks (population >1000)
- Establishment of fresh water supply system that incorporate and integrates rain water harvesting and desalination technology
- Right now we don't have a water adaptation strategy
- Water Act (draft) have been sent to Attorney General's Office for comment
- Climate Change Adaptation strategy
- Dam safety and Water Resources Planning Project (DSWRP)
- Climate Resilient improvement project
- Cascade Development Project
- Trans Basin Diversions
- Construction of new storages

Regional initiatives relevant to South Asia

- Develop drought monitoring system – South Asian collaboration
- GWP, SAARC, CAPNet,

Question 2: Lessons learnt and major Gaps

Afghanistan

Lessons Learnt

- Water related legislation have helped in better water management and dispute settlement
- Reduction in water loss by concrete lining of canals

Major gaps/barriers

Capacity, poverty, Security and funds

Bangladesh

Lessons Learnt

- Bilateral and multilateral cooperation
- Mobilization of resources

Major gaps/barriers

- Resource mobilization
- Public awareness

Bhutan

Lessons Learnt

- Bilateral and multilateral cooperation
- Mobilization of resources

Major gaps/barriers

- Resource mobilization
- Public awareness

Pakistan

Lessons Learnt

- Due to trans-boundary water resources, need better coordination and raising trust level for improved river basins and flows management.
- Increase hydro-met network density specially at high elevations

Major gaps/barriers

- Country specific high resolution climate change projections
- public awareness/participation
- Limited high elevation data

Maldives

Lessons Learnt

- Improvement of ground water quality (due to IWRM)
- Introduce the use of renewable drinking water and to protect ground water

Major gaps/barriers

Lack of regulatory framework, guidelines and standards (at national level)

Sri Lanka

Lessons Learnt

- Requirement of multi-sectoral coordination
- Budget
- Awareness of top to bottom and vice versa
- Need to aware political parities regarding CC to incorporate future development plans

Major gaps/barriers

- Less priority for developing plans of different agencies
- Insufficient commitment of Ministry of Finance
- Political will- focused on hardware development

Question 3: In your sector/country, what are the key opportunities and key challenges to integrate NAPs into the national development processes?

Afghanistan

Opportunities

- International collaboration available
- Existence of 5 Hydrological surveillance system of 5 water basins

Challenges

- Lack of capacity and specialists
- Security issues at some places
- Limited funds
- Problems of law enforcement in some areas

Bangladesh

Opportunities

- Already formulated NAPA, BCCSAP, Water Act 2013, BCCTF, BCCRF

Challenges

- Various natural calamities
- Lack of resources

Bhutan

Opportunities

- Serves as a national guideline in addressing land degradation issues

Challenges

- Lack of co-financing
- Lack of information/data
- Lack of capacity
- Lack of technical expertise
- Absence of institution to take up the lead role

Pakistan

Opportunities

- More frequent climate change debates among national stakeholders to include NAP into nation development process

Challenges

- National level consensus among all provinces
- Low sensitivity of policy/decision makers to climate change threat

Maldives

Opportunities

- Enhances the role private sector participation in provision of water
- Thus helps government to become a regulator and a facilitator

Challenges

Major challenge is geographical distribution of Maldives's islands

Increase in population
Sector cost implication

Sri Lanka

Opportunities

- Basic Documents – Haritha Lanka Programme
TNA
Vulnerability Profiles etc.

Challenges

- Sectoral Plans
- Not interlink

Afghanistan

NAP Activities

- Assessing climate vulnerabilities and identifying adaptation options
- Integrating CC adaptation into national planning
- Prioritizing CC adaptation in national planning
- Developing a long term national adaptation implementation strategy
- Enhancing capacity for planning and implementing adaptation
- Monitoring , reviewing and iteratively updating the NAP process
- Out reach and reporting on progress and effectiveness

Q4. Looking at the printout of the NAP poster, identify which activities are relevant in your sector to start NAP process

Bangladesh

NAP Activities

- Assessing climate vulnerabilities and identifying adaptation options
- Prioritizing CC adaptation in national planning
- Enhancing capacity for planning and implementing adaptation
- Reviewing the NAP process to assess progress, effectiveness and gaps

Bhutan

NAP Activities

- Addressing capacity gaps
- Assessing climate vulnerabilities and identifying adaptation options
- Prioritizing CC adaptation in national planning
- Enhancing capacity for planning and implementing adaptation
- Reviewing the NAP process to assess progress, effectiveness and gaps

Pakistan

NAP Activities

- Assessing climate vulnerabilities and identifying adaptation options
- Integrating CC adaptation into national planning
- Prioritizing CC adaptation in national planning
- Developing a long term national adaptation implementation strategy
- Enhancing capacity for planning and implementing adaptation
- Monitoring , reviewing and iteratively updating the NAP process
- Out reach and reporting on progress and effectiveness

Maldives

NAP Activities

- Prioritizing CC adaptation in national planning
- Enhancing capacity for planning and implementing adaptation
- Reviewing the NAP process to assess progress, effectiveness and gaps
- Compressive iteratively accessing development need and climate vulnerabilities.
- Analyzing current climate and future climate change scenario

Sri Lanka

NAP Activities

- Sri Lanka already initiated the NAP process.
- Stocktaking is in the process to identify the available information.
- All the other activities related to the element A and B needed.
 - Element A 3-4
 - Element B 1-5