



NAP-GSP REGIONAL TRAINING WORKSHOP FOR ASIA Mainstreaming Climate Change Adaptation into Water Resources

Seoul, 13 - 16 September 2017

**Session 3–Vulnerability & risk assessments
Agnes Balota**

National Adaptation Plan (NAP) Country-level training

Module III.1

Climate Information for Risk & Vulnerability Assessments

On behalf of



Federal Ministry
for Economic Cooperation
and Development

In cooperation with



Empowered lives.
Resilient nations.





About yesterday...

- Water-related SDGs, climate change impacts, national priorities, policy and legal framework
- Risk mapping and the kind of climate information needed
- Relevant climate information sources and accessing climate information
- Impacts of climate phenomena on ecosystems and human well-being



For this session:

- Examine the concepts of **vulnerability** and **risk** and their components
- Identify factors contributing to risk and vulnerability in a system as a first step to a systematic approach to climate change adaptation



Risk & vulnerability to climate change

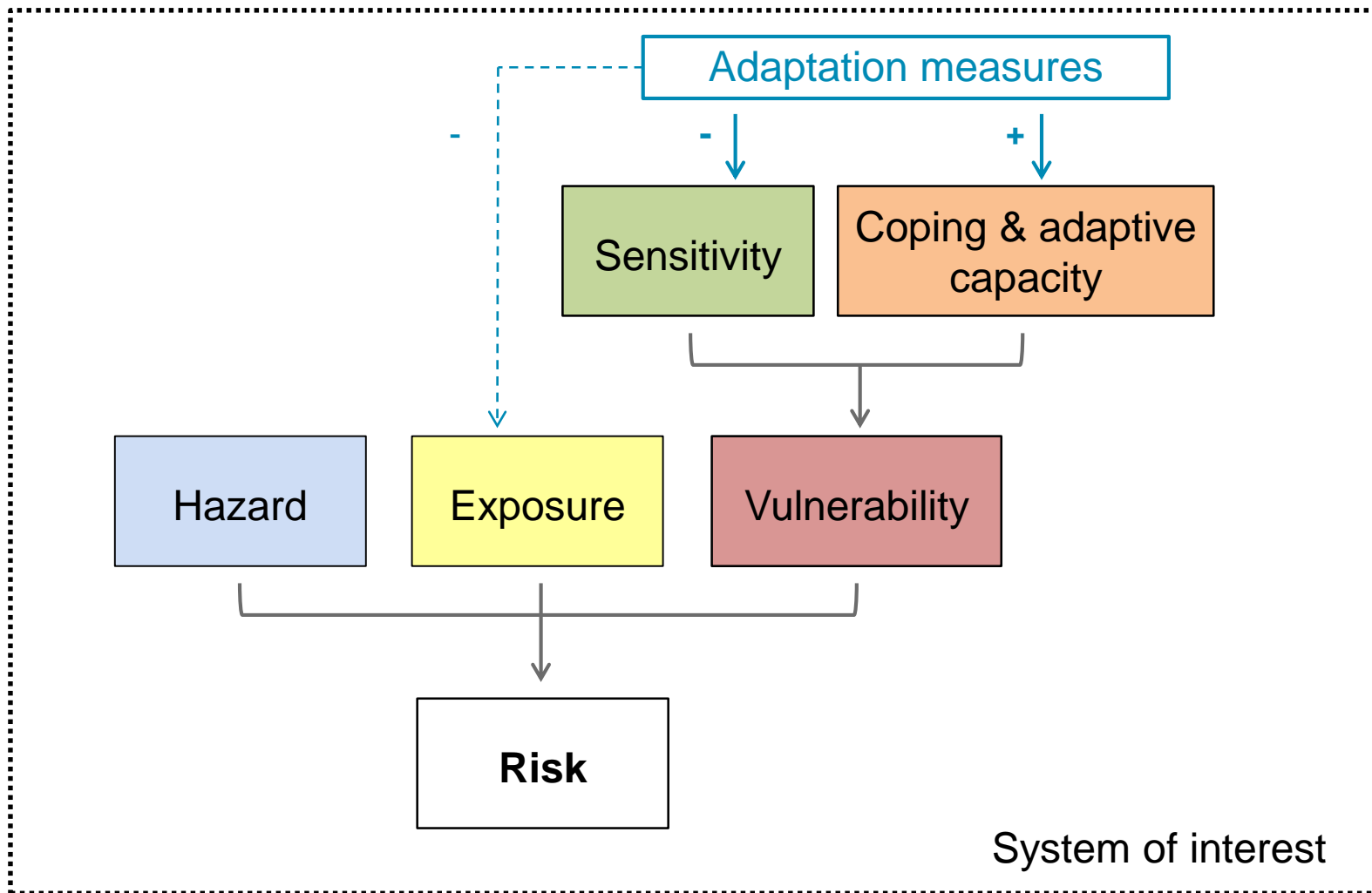
- No universally accepted relationship between ‘risk’ & ‘vulnerability to climate change’ available
- IPCC AR5 focuses on **risks** and uses the following definition:
 - “[The] probability of occurrence of hazardous events or trends multiplied by the impacts if these events or trends occur (p. 1048)”
- Results from interaction of **three components**:
 - Hazard
 - Exposure
 - Vulnerability



Source: Climate Media
Factory, Potsdam



Risk & vulnerability to climate change

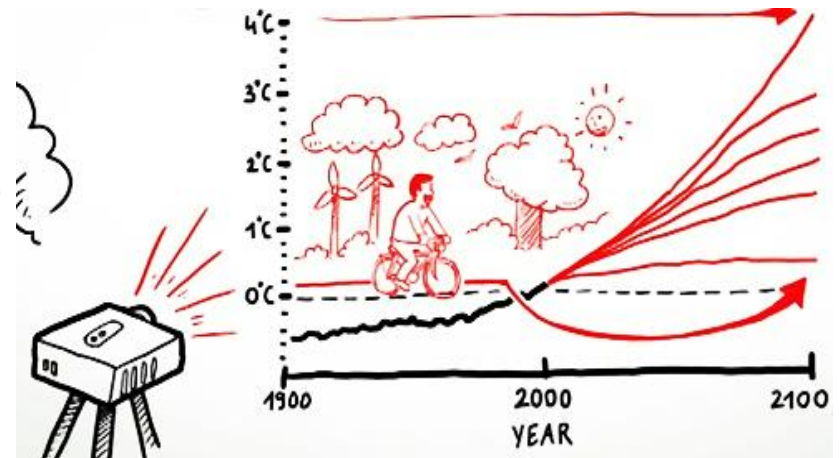




Group Work: Vulnerability and Risk Assessment

Part 1: Take stock of current situation in your system of interest

Part 2: Deal with the future



Source: Climate Media Factory, Potsdam



Group Work: Vulnerability and Risk Assessment

Part 1: Take stock of current situation in your system of interest

1. Recall the output of your group work yesterday.
2. Identify the natural and social assets (e.g. crops, equipment, community institutions) and relevant actors (e.g. farmers, labourers, traders) within the system.
3. List climatic changes already experienced, such as changing precipitation patterns, temperature extremes, etc.
4. Consider if and how the system of interest's actors and assets are currently sensitive to climate variability
5. Elaborate the system's current coping and adaptive capacity



Session 1 Output

Nepal				
Water Sector and Selected key water related sectors	Impacts of Climate	Challenges	Policy and Legal Framework	National Priorities
Water Resources	<ul style="list-style-type: none"> - Temp. rise - Variation in precipitation & rainfall, - water induced disasters (flood) & Snow melting. - GLOF, Drought 	<ul style="list-style-type: none"> - Capacity gap - Resources gap - Data gap - Technology 	<ul style="list-style-type: none"> - Constitution - Water Resource Act and P.L. - Climate change Policy 	<ul style="list-style-type: none"> - Drinking water - Irrigation - HP - Health - Tourism - NCCSP - EBA - PPCR - NAP
WASH	<ul style="list-style-type: none"> - Loss of water source, - water borne disease - Waste mgmt (post disasters) 	<ul style="list-style-type: none"> - Inter-sector Coordination. - Effective 	<ul style="list-style-type: none"> - NAPA, LAPA, - NAP in Progress - Env. Act/Reg - IEE/EIA 	
Agriculture	<ul style="list-style-type: none"> - Land degradation - Drought - Change in crop pattern 	<ul style="list-style-type: none"> - Implementation of existing Policy Programs 		



Your Group Task, Part 1

- Take stock of recent situation in your system of interest

System of Interest in the Water Sector	A	B	C
	Current Climate Variability	Current Sensitivity	Current Coping & Adaptive Capacity
[Nepal] <i>Irrigation system</i> <i>Farmers</i>	<ul style="list-style-type: none">• Variation in rainfall• Drought• Loss of water source	<ul style="list-style-type: none">• xxx	<ul style="list-style-type: none">• Xxxx



Your Group Task, Part 1

- Take stock of current situation in your system of interest

System of Interest in the Water Sector	A	B	C
	Current Climate Variability	Current Sensitivity¹	Current Coping & Adaptive Capacity²
[Nepal] <i>Irrigation system</i> <i>Farmers</i>	<ul style="list-style-type: none">• Variation in rainfall• Drought• Loss of water source	<ul style="list-style-type: none">• Irrigation infrastructures built over period of time have deteriorated• Farmers lack alternative livelihood	<ul style="list-style-type: none">• Vibrant Farmer Managed Irrigation Systems (FMIS) exists• FMIS recognized within the plans and policies of the state

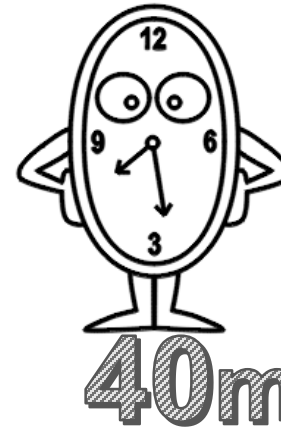
¹ [Nepal NAPA \(2010\)](#)

² [Pradhan \(2000\)](#). "Farmer managed irrigation systems in Nepal at the crossroad," Paper prepared for the 8th Biennial Conference of the International Association for the Study of Common Property (IASCP). Bloomington, Indiana; May 30 to 4 July, 2000



Group Work: Part 1

Vulnerability & Risk Assessment



Take stock of
current situation
in your system
of interest

System of Interest in the Water Sector	A	B	C
	Current Climate Variability	Current Sensitivity	Current Coping & Adaptive Capacity
<i>Assets</i>			
<i>Actors</i>			

[Cartoon clock](#)



Group Work: Vulnerability and Risk Assessment

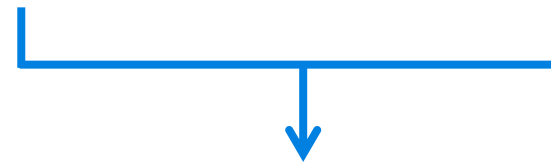
- **Part 2: Deal with the future**
 1. Identify the **hazards** or climate change signals the system of interest will be exposed to → Climate related physical events or trends or their physical impacts
 2. Define the **exposure** of the elements (assets, actors) of your system of interest → The presence of people, livelihoods, infrastructure etc. in places and settings that could be adversely affected.
 3. Assess the **vulnerability** based on sensitivity and coping & adaptive capacity.
 4. Define the **risk** and rate the **need for action**.



Your Group Task, Part 2

- Deal with the future

B	C
Current Sensitivity	Current Coping & Adaptive Capacity
<ul style="list-style-type: none"> Irrigation infrastructures built over period of time have deteriorated Farmers lack alternative livelihood 	<ul style="list-style-type: none"> Vibrant Farmer Managed Irrigation Systems (FMIS) exists FMIS recognized within the plans and policies of the state



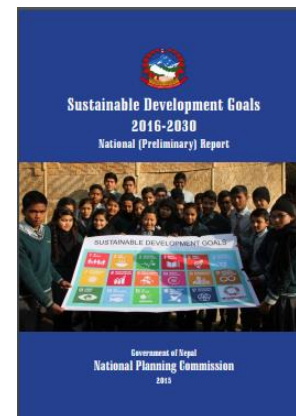
System of Interest	D	E	F	G
	Hazard that the system of interest will be exposed to	Exposure	Vulnerability Assessment Based on sensitivity & capacity	Risk level and need for action (Rate 1-5)
<i>[Nepal]</i> <i>Irrigation system</i> <i>Farmers</i>	<ul style="list-style-type: none"> Increasing temperature and frequency of hot days and nights More frequent extreme events (droughts, floods) 			



Your Group Task, Part 2

- Deal with the future

System of Interest	D Hazard that the system of interest will be exposed to	E Exposure	F Vulnerability Assessment Based on sensitivity & capacity	G Level of Risk and Need for action (Rate 1-5)
<p><i>[Nepal]</i> <i>Irrigation system</i></p> <p><i>Farmers</i></p>	<ul style="list-style-type: none"> Increasing temperature and frequency of hot days and nights More frequent extreme events (droughts, floods) 	<ul style="list-style-type: none"> Terai Irrigation Systems in (low lying) large areas are exposed to flooding from large rivers¹ 	<p>High</p> <p>Intakes of Terai Irrigation Systems are washed away by floods; require frequent repair – O&M cost are born by the farmers themselves¹</p> <p>Farmers rely heavily on small scale agriculture; O&M cost are born by the farmers themselves¹</p>	<p>¹Pradhan (2000).</p>



SDG Targets and Indicators for Nepal (2014–2030)

Target 2.3 By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment

2.3a Land productivity (metric tonnes per hectare)	3.6 ^c	4.1	4.5	4.8	5.3	6
2.3b Fertilizer use (kg per hectare)	88 ^f	90.3	92.5	94.0	96.3	100
2.3c Access to finance for agriculture (agriculture loans as % of total bank loans)	5 ^f	6.9	8.8	10.0	11.9	15
2.3d High yield seeds (kg per hectare)	2.8 ^f	3.2	3.6	3.9	4.3	5
2.3e Round the year irrigated land in total arable land (%)	40 ^f	47.5	55.0	60.0	67.5	80
2.3f Agriculture insurance coverage (% of agriculture households)	0.5 ^f	5.1	9.7	12.8	17.3	25
2.3g Agricultural households with lands (%)	73.9 ^b	74.1	74.3	74.5	74.7	75.0



Your Group Task, Part 2

- Deal with the future

System of Interest	D Hazard that the system of interest will be exposed to	E Exposure	F Vulnerability Assessment Based on sensitivity & capacity	G Level of Risk and Need for action (Rate 1-5)
<p><i>[Nepal]</i> <i>Irrigation system</i></p> <p><i>Farmers</i></p>	<ul style="list-style-type: none"> • Increasing temperature and frequency of hot days and nights • More frequent extreme events (droughts, floods) 	<ul style="list-style-type: none"> • Terai Irrigation Systems in (low lying) large areas are exposed to flooding from large rivers 	<p>High</p> <p>Intakes of Terai Irrigation Systems are washed away by floods; require frequent repair – O&M cost are born by the farmers themselves</p> <p>Farmers rely heavily on small scale agriculture;</p>	<p><i>High risk and need for action to achieve SDG Target 2.3</i></p>



Group Work: Part 2

Vulnerability & Risk Assessment



Deal
with
the
future

System of Interest in the Water Sector	A	B	C
	Current Climate Variability	Current Sensitivity	Current Coping & Adaptive Capacity
<i>Assets</i>			
<i>Actors</i>			

[Cartoon clock](#)



Reflection on the Exercise

- Existing information from national assessments or programs are usually available as a starting point
-
-



In summary, vulnerability and risk assessment:

- Establishes the basis for integrating adaptation into development efforts
- Recognition of climate risks and the need for adaptation within relevant policies, programmes and projects
- Help to identify what or who is most vulnerable, where they are located, what risks they face and the need for action
- Improve understanding of specific risks and vulnerabilities in different localities
- Provide the opportunity for awareness raising and capacity building
- Provide evidence of the linkages between climate and development
- Serve as a baseline analysis to monitor how risks may be influenced by a changing climate over time



Thank you.



Imprint

This presentation is part of a [NAP country-level training](#) that has been developed by GIZ on behalf of BMZ and in cooperation with the NAP Global Support Programme (NAP-GSP), in particular UNDP and UNITAR.

The training is designed to support countries in setting up a National Adaptation Plan (NAP) process. It builds on the NAP Technical Guidelines developed by the Least-Developed Countries Expert Group (LEG).

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