Developing impact chains for the draft NAP
Workshop I
June 15, 10:30am-16:00pm, Bangkok
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Risk and Vulnerability Concept based on IPCC AR5

- **IPCC AR4 (2007)**
  - Conceptual framework of impact chains based on vulnerability definition presented in IPCC AR4 (2007)
  - **Vulnerability**: Exposure, sensitivity, adaptive capacity

- **IPCC AR5 (2014)**
  - Notion of risk at the heart of the new framework
  - **Risk**: Interaction between hazard, exposure and vulnerability
Risk and Vulnerability Concept based on IPCC AR5

IPCC AR5 Risk Concept (2014)

Risk: The potential for consequences where something of value is at stake and where the outcome is uncertain, recognizing the diversity of values. Risk is often represented as probability of occurrence of hazardous events or trends multiplied by the impacts if these events or trends occur. Risk results from the interaction of vulnerability, exposure, and hazard. In this report, the term risk is primarily to refer to the risks of climate-change impacts. (IPCC 2014)

Vulnerability: The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt. (IPCC 2014)

Exposure: The presence of people, livelihoods, species or ecosystems, environmental functions, services and resources, infrastructure or economic, social, or cultural assets in places and settings that could be adversely affected. (IPCC 2014)

Hazard: The potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources. In this report, the term hazard usually refers to climate related physical events or trends or their physical impacts. (IPCC 2014)
Advantages of the AR5 concept

• ‘Risk‘ is better known in public than ‘vulnerability‘, it is more concrete, and it is directly associated with threat. (IPCC 2014)

• The concept allows for an easier translation of information for management planning and/or policy making, because risk management approaches are better known and already established in practice. (IPCC 2014)

• The concept consolidates the two concepts of climate change adaptation and (disaster) risk management; this helps to improve communication and to identify potential for synergies – both on the institutional level and on the level of implementation of interventions. (IPCC- SREX 2012)
Methodology for developing impact chains

• What is an impact chain?
  • An **analytical tool** to better understand, systemize and prioritize the factors that drive risk and vulnerability in a given system (cause-and-effect relationship)
    • Provide the opportunity to discuss in a participatory process all relevant risk factors in detail (different risks may characterize a single sector) as well as interlinkages across sectors
    • Broadens the understanding of the factors that drive climate change risk in a given country or system
    • Helps to familiarize with the concept of climate change vulnerability, risk and adaptation
  • A **basis** for a risk and vulnerability assessment to identify indicators and adaptation measures
  • A **representation** of how potential climate change risks can affect a system via direct and indirect impacts
    • Leads the prioritization of the most relevant climate change risks for deeper analysis and for identifying sector and area specific adaptation measures
• **How does an impact chain look like?**
  • Organised around the main components of the risk/vulnerability concept,
  • Both the structure and visualization of impact chains can vary enormously
  • An impact chain can be highly complex, but also very simple, depending on:
    a) the amount of and/or the level of inter-dependency between individual risk factors
    b) the level of detail needed for analysing a specific system (or sector)
Impact chains: Examples from Germany and Tanzania

**Example I**

German Vulnerability Analysis (2015): Coastal protection
Impact chains: Examples from Germany and Tanzania

Example II

- Variability in seasons
- Extreme rainfall, dry spells, storms
- Increasing temperature
- Decreasing annual precipitation

Unpredictable amount of rainfalls
- Changes in evapotranspiration

FLOODS
- DROUGHTS

AGRICULTURE (crops)
- Livestock (animals)

Water Resources
- Soils (including fertility)
- Health (crops, livestock)
- Other natural resources (forest, wetlands, etc.)

RISK OF CLIMATE CHANGE IMPACTS FOR FARMERS AND PASTORALISTS IN SIMIYU REGION

- Shortage of grazing grounds
- Increase in crop and livestock disease
- Affected plant growth

- Land use conflicts
- Death of animals
- Low yields and crop failure

- Impoverished livelihoods
- Food insecurity

Vulnerability Analysis for Simiyu region, Tanzania (2016): Farming
<table>
<thead>
<tr>
<th><strong>Do’s</strong></th>
<th><strong>Dont’s</strong></th>
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<tbody>
<tr>
<td><strong>Be realistic</strong>: Try to elaborate a realistic picture of your sector</td>
<td>Don’t attempt to capture all aspects of reality in all its details and interconnections</td>
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<td><strong>Be pragmatic</strong>: Visualize direct impacts and relevant factors first</td>
<td>Don’t lose yourself in little details and indirect impacts (otherwise the impact chain won’t be understandable to others)</td>
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<td><strong>Be focussed</strong>: Concentrate on the most important relationships between factors</td>
<td>Don’t try to visualize all available interactions between factors (try to distinguish between direct and indirect relations)</td>
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<td><strong>Be clear about components</strong>: <em>Ideally</em>, define biophysical factors as sensitivity and socio-economic factors as adaptive capacity; adjust to your sector</td>
<td>Don’t duplicate sensitivity and adaptive/coping capacities.</td>
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<td><strong>Put the impact chain on solid grounds</strong>: Do background research; base your assumptions on scientific literature and expert opinions</td>
<td>Don’t restrict your impact chain to data availability</td>
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Discussion

Questions & Answers
Introduction into group work

• Prototype Impact Chain

Hazards
- Rising CO2 levels
- Rising Temperature
- Precipitation Change (seasonal and yearly variability)
- Sea Level Rise
- Extreme Precipitation
- Tropical Storms
- Extreme Heat
- Changes in Air Quality
- Ocean Acidification, Degraded Reefs, Coral Bleaching
- Forest Fires
- Change of Rainy Seasons
- Changes in Water Quality and Availability
- Coastal Erosion/Salt Water Intrusion
- Floods/Landslides
- Changes in Air Stream
- Heat Waves, Droughts, Urban Heat Islands

Prototype Impact Chain

Gradual Changes

Extreme Events

Coping & Adaptive Capacities
- Institutions (Example)
- Technology (Example)
- Knowledge (Example)
- Economy (Example)

Exposure

Risk

Overall Risk:
- Decrease/Decline/Reduction/Destruction of Specific Sector
- Threats to Livelihoods and Economic Losses

Sensitivity
- Water Demand
- Heat Resistance
- Non-Resilient Infrastructure
- Risk-Prone Areas
**Exercise**

1. Build groups comprising representatives of the six sectors, agree on a speaker
2. Agree on those hazards that are relevant for your sector (20 minutes)
3. Define the main exposure factors and their characteristics that are relevant for your sector; write down these factors on cards (40 min)