

National Adaptation Plan (NAPs) BHUTAN

September 2015

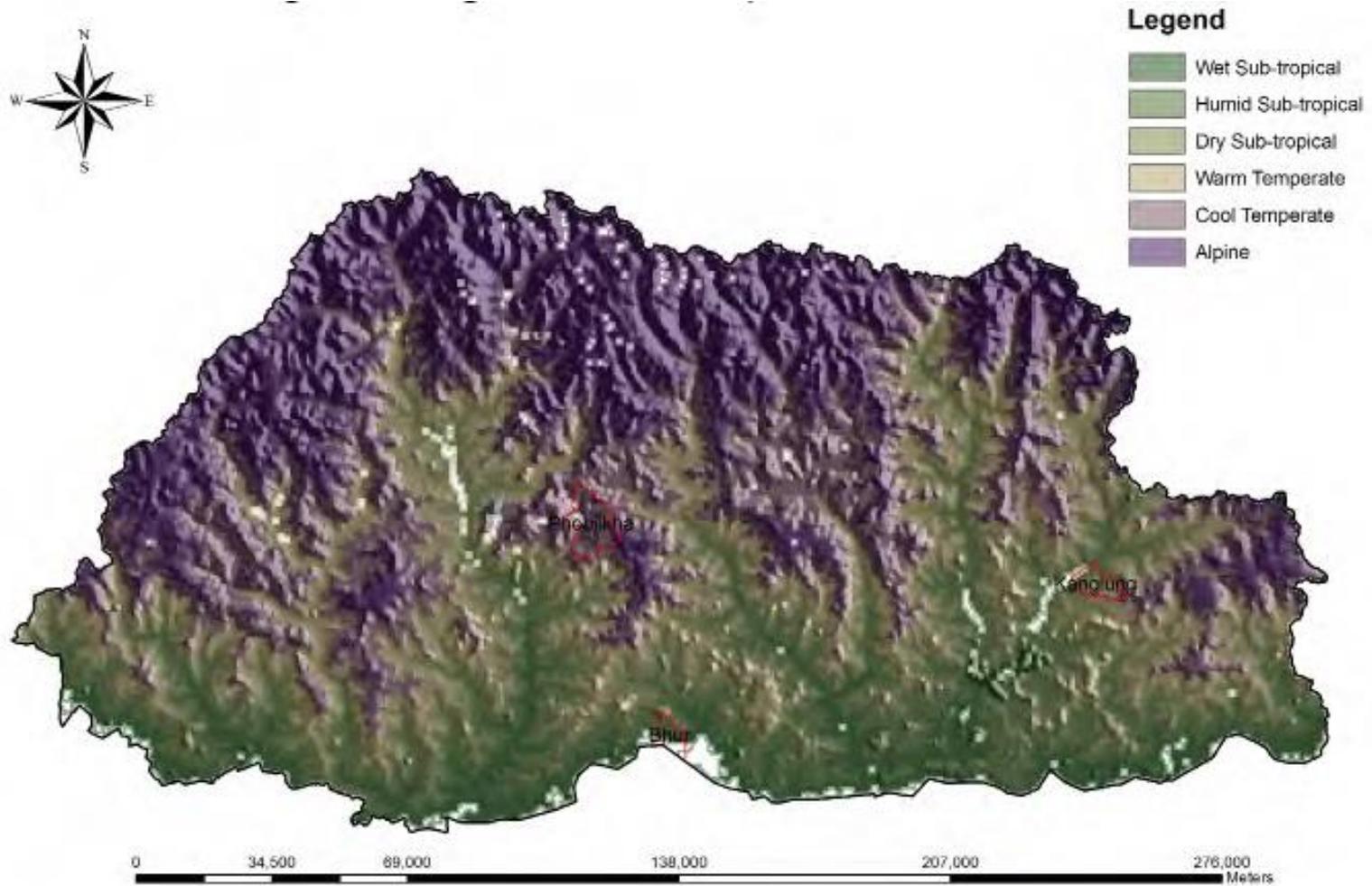


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Bhutan



Climate of Bhutan



Bhutan's Vulnerability to Climate Change



fragile mountainous landscape



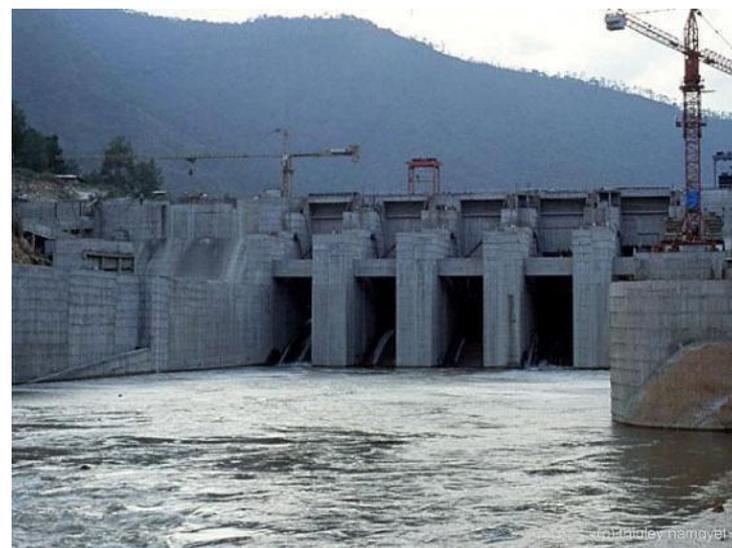
landlocked & least developed country

Heavy dependence on climate sensitive sectors

Low level of economic diversification



Agrarian society
(69% of population)



Large investments in
hydropower

Large areas of glaciers and glacial lakes



Current Vulnerabilities

- Glacial Lake Outburst Floods
 - due to temperature rise
- Land Degradation
 - Landslides, erosion due changes in to weather patterns, high intensity rainfall, cyclones
- Flashfloods
 - Intense rainfall periods, cyclones
- Droughts
 - Drying water sources due to temperature rise, longer intervals between rains
- Wind and Thunder storms
- Pests and diseases



Potential areas impacts of climate change in Bhutan



Human Health

Rising Temperatures may cause the spread of tropical diseases and heat stress into higher altitudes.



Natural Disasters

Rapidly retreating alpine glaciers is increasing the risk of 'glacial lake outburst floods' endangering life and property downstream. Increasing flash floods may also be caused by intensifying



Agriculture

80% of the Bhutanese practice subsistence farming. Climate Change can cause changes in temperature and precipitation patterns and increase the vulnerability of a large group of this population.



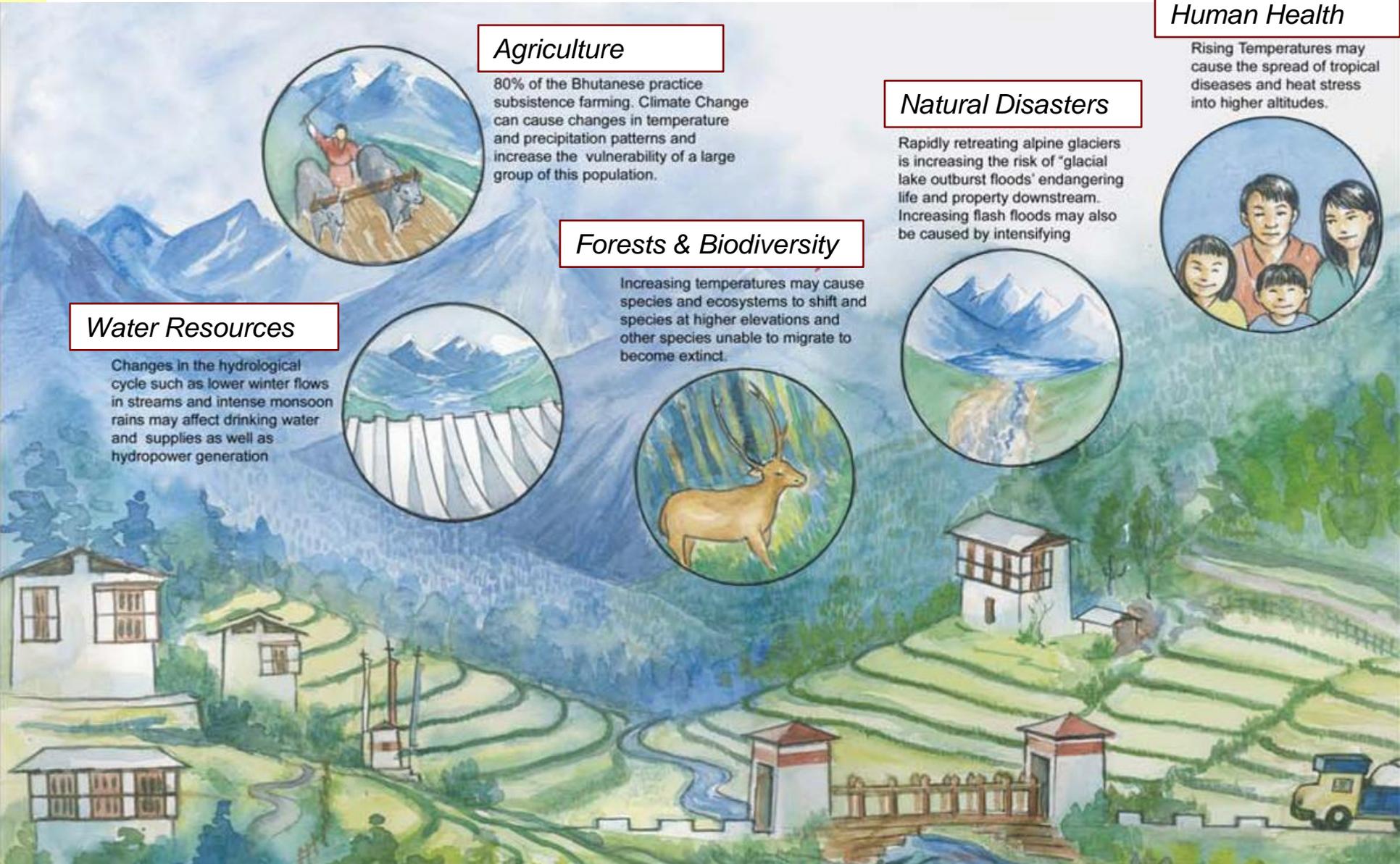
Forests & Biodiversity

Increasing temperatures may cause species and ecosystems to shift and species at higher elevations and other species unable to migrate to become extinct.



Water Resources

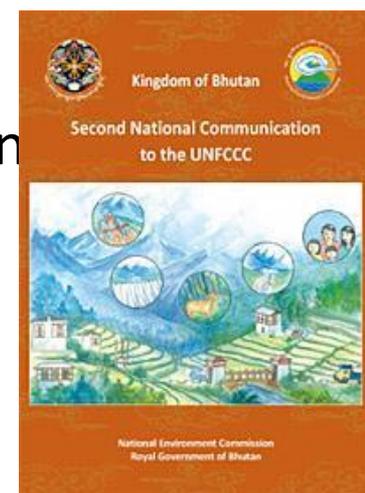
Changes in the hydrological cycle such as lower winter flows in streams and intense monsoon rains may affect drinking water and supplies as well as hydropower generation





Past and ongoing Adaptation Activities

- National Adaptation Programme of Action (NAPA)
 - NAPA I project (completed in 2013)
 - NAPA 2 Project (ongoing)
 - NAPA 3 Project (PIF approved)
- Vulnerability Assessment and medium- long term adaptation needs in Second National Communication to UNFCCC
- Second Technology Needs Assessment on Adaptation
- Several climate change adaptation projects implemented by various sectors

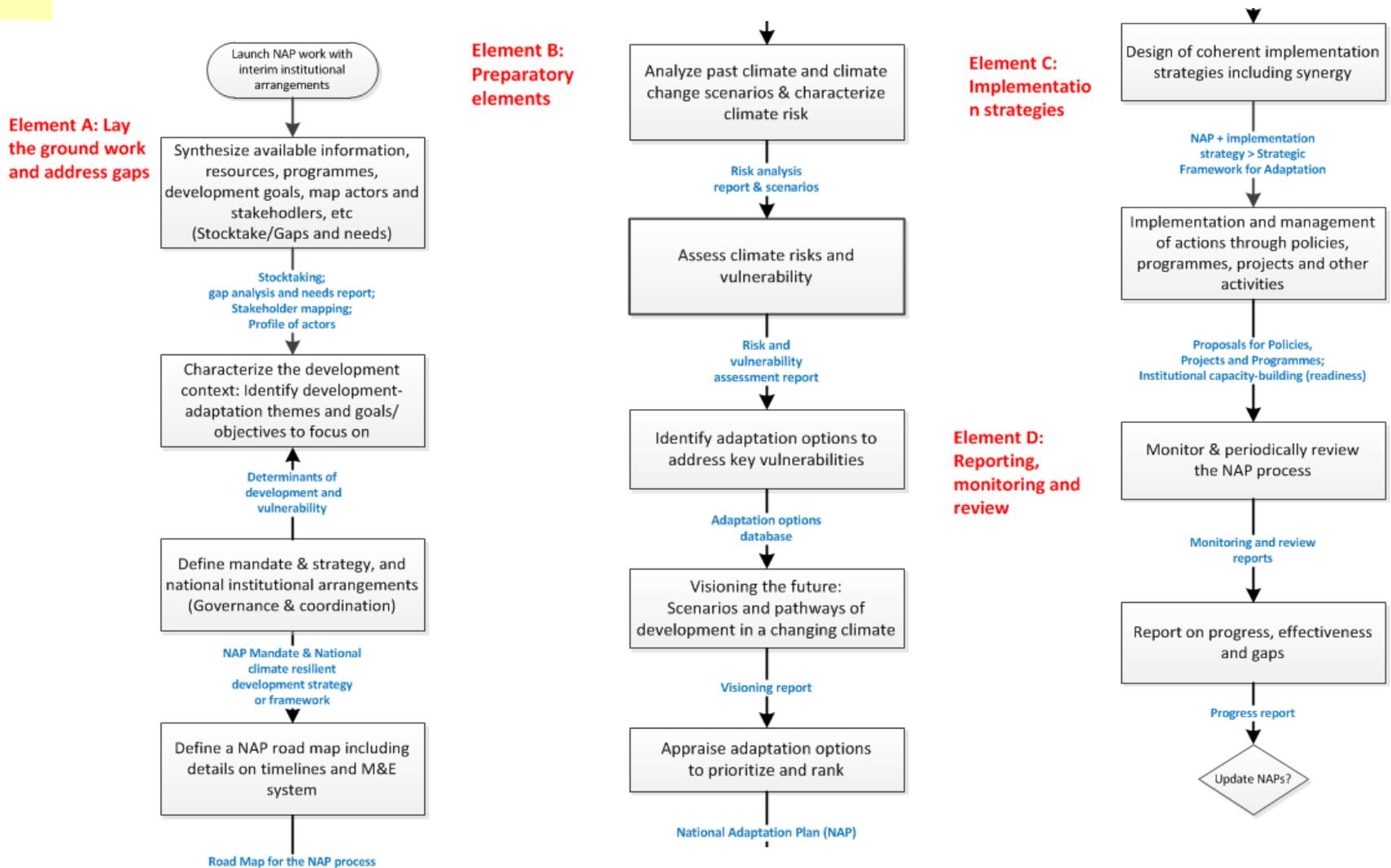




NAP Process

- Ideas and experience from the LEG Workshop in Yangon, Myanmar in August 2015
- Bhutan's NAP (status, plans and programmes)

1. Scoping the NAP Process



2. Stakeholder and Actor Mapping

- Stocktaking activities (NAPA, SNC, TNA, CC dialogue)
- Identifying gaps and needs
- Stakeholder Sensitization on NAP
 - Commission (high level cc committee) has been briefed
 - Wider sector/stakeholder informed through climate dialogue
- Stakeholder analysis

Sectors/ministries
Local government
NGO, CSO
Research institutions
Communities
Banks, UN, Bilateral partners

....

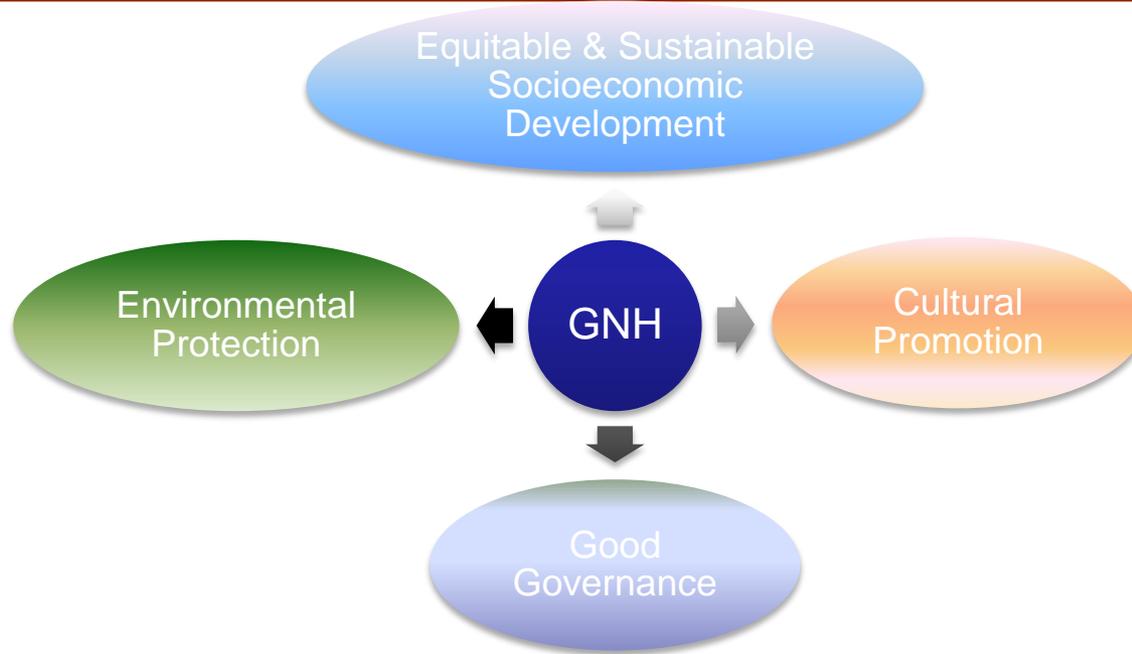
3.1 Policy and Institutional Arrangements

- Defining the Mandate



- Integration into planning and M&E tools
- Road map
- Challenges
 - Changing political government
 - Enforcement of the mandate

Development and Bhutan



- Middle Path Strategy
- Vision 2020
- Plans to develop a Policy/strategy on Climate change
- Adaptation & NAPs are part of Bhutan's INDC

3.2 Development first systems approach

- Identified sectors that are main drivers of your development

Hydropower

- Run-of-river type
- Export of electricity: ~42% of GDP
 - Export to India, winter season needs import
- 1606 MW installed capacity

Agriculture

- Goal: prioritize self-sufficiency
- 60% population livelihood
- Mostly rain-fed
- Crops: rice, wheat, maize...
- Livestock are important as a source of milk, meat, and draft power

Tourism

- Policy: “high value, low impact” tourism
- ~40% of GDP: government tax
- Peak seasons: spring & autumn
- Mostly by air

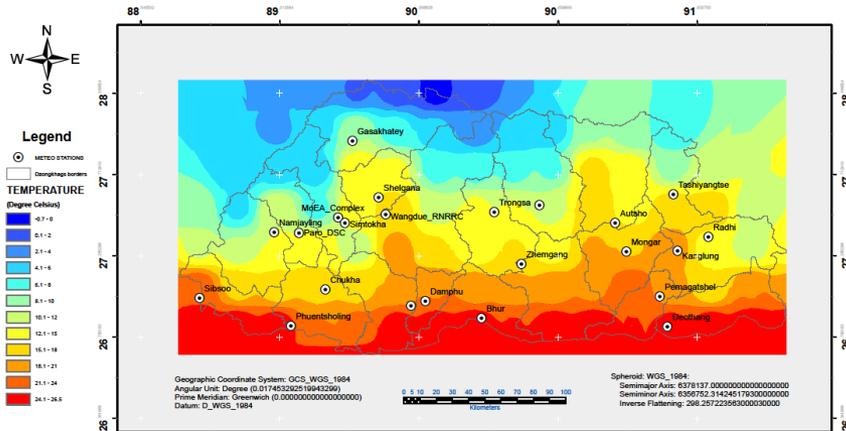
Water

- Glacier, river, streams
- Centralized water supply system
- Streams dry up
- GLOFs

3.3 Climate risk

- Past and current climate risks
- Future climate projects and risk
- V&A assessments

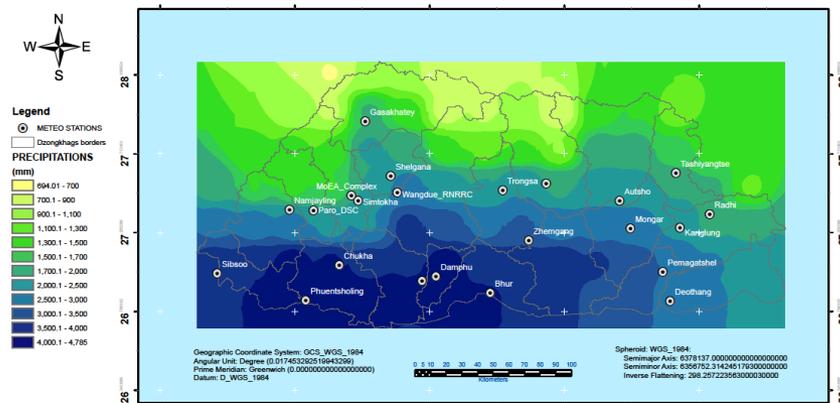
Map of the spatial changes in mean annual temperature (degrees Celsius) for Bhutan for the period 2040-2069 according to the PRECIS-downscaled ECHAM5 model



Second National Communications of Bhutan to the UNFCCC
National Environment Commission
Royal Government of Bhutan
Thimphu, BHUTAN

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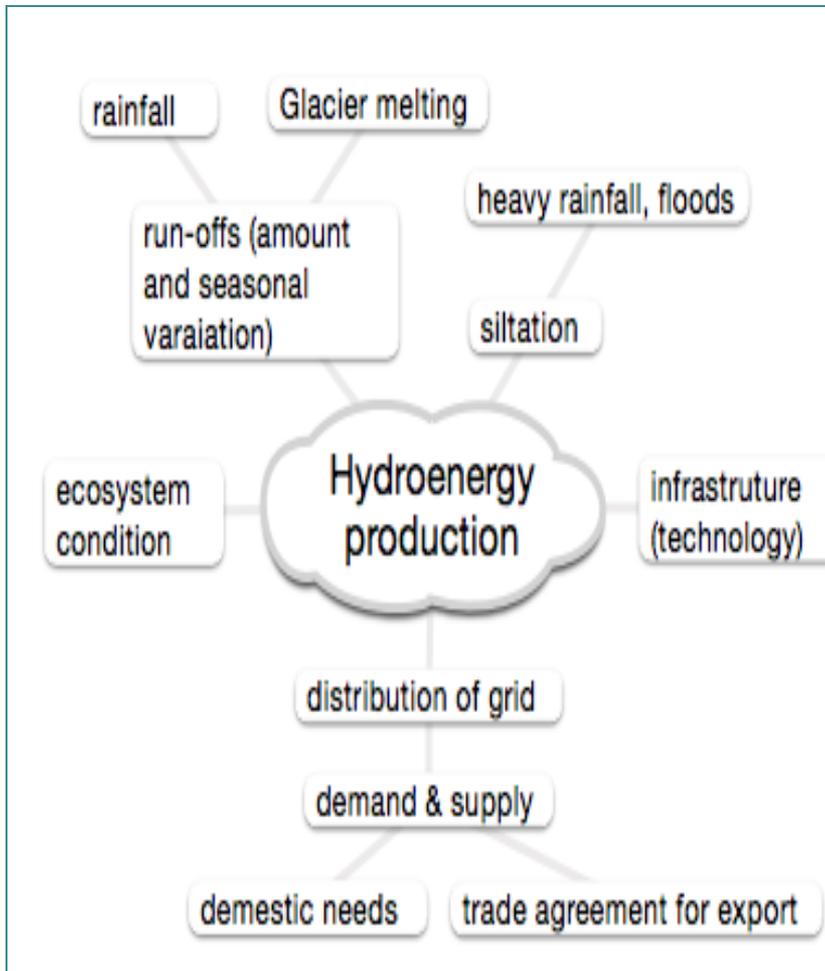
Map of the spatial changes in cumulative annual precipitations (mm) for Bhutan for the period 2040-2069 according to the PRECIS-downscaled ECHAM5 model



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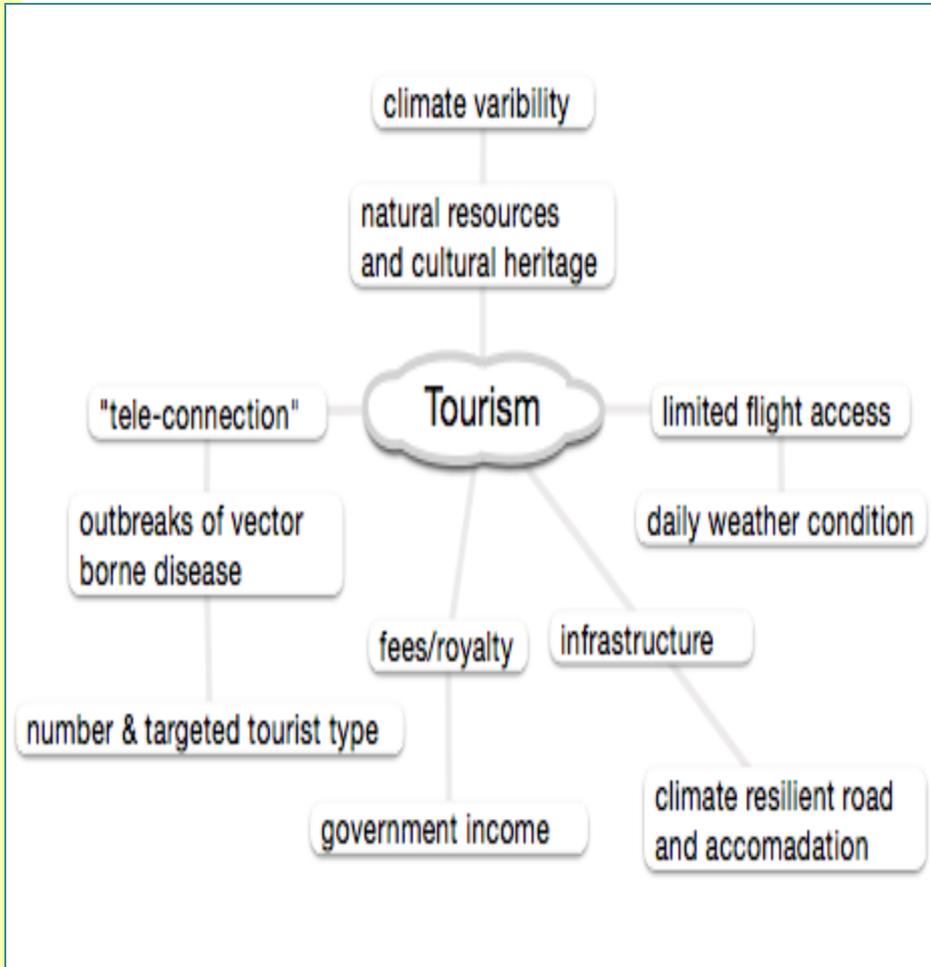
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Key vulnerabilities of the sectors & Adaptation Options



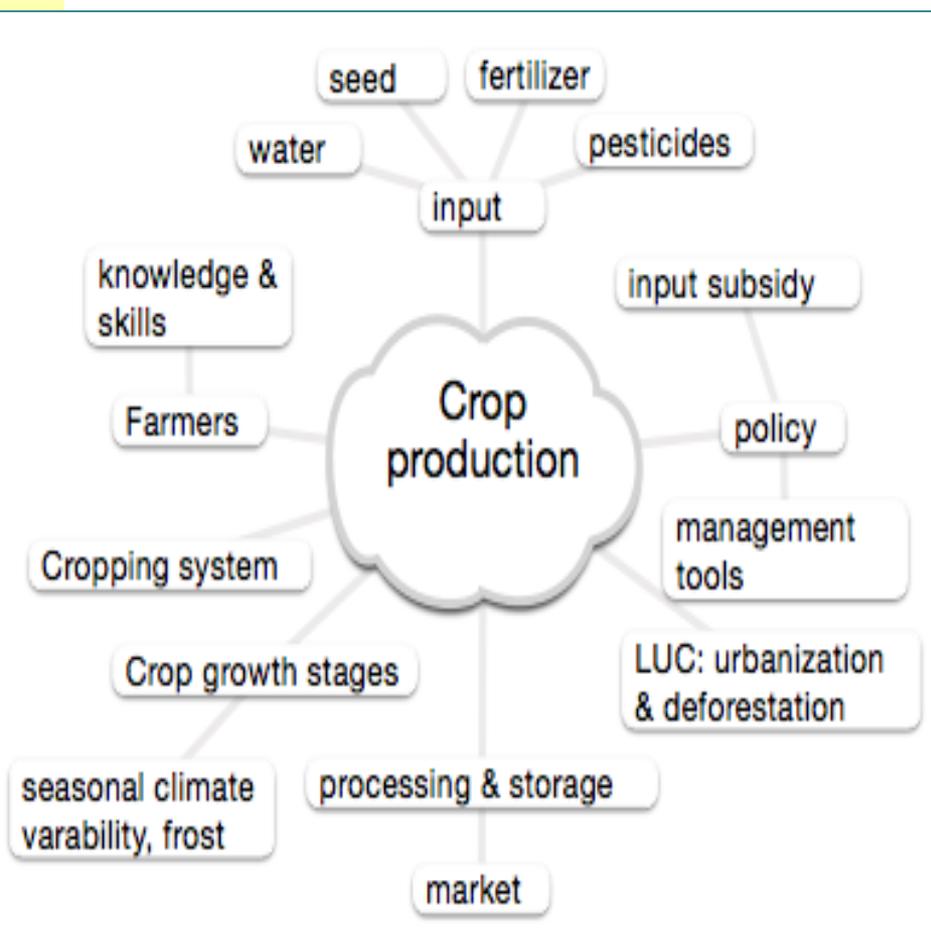
Vulnerability	Adaptation options
Run-off variability (input to hydro production)	<ul style="list-style-type: none"> – Build/expand reservoir capacity – Stepwise generation
Energy availability to local users due to competing uses when production limited	<ul style="list-style-type: none"> - Demand side management: energy efficiency - Diversify energy sources, e.g.: solar, biomass
High maintenance costs due to siltation damage on turbines	<ul style="list-style-type: none"> – Siltation ponds/dams – Regular maintenance – SLM

Key vulnerabilities of the sectors & Adaptation Options



Vulnerability	Adaptation options
Limited air access	<ul style="list-style-type: none"> – Increase access through more airport and flights
Vulnerable infrastructure (roads)	<ul style="list-style-type: none"> – Landslide mitigation – Ropeway – Climate resilient bridge design
Number and demographic of tourist due to increase health risk from VBDs and tele-connection	<ul style="list-style-type: none"> – Vector surveillance rapid response
Natural & cultural heritage	<ul style="list-style-type: none"> – Awareness preparations – EBA, conservation of biodiversity – Disaster risk management

Key vulnerabilities of the sectors & Adaptation Options



Vulnerability

Adaptation options

Farmer livelihood at risk from disrupted production

- Insurance (risk sharing)
- Diversify livelihoods
- Selection of crops variety
- Provide Extension and services
- R&D and outreach on input factors
- incentives

Loss of production

EbA/CbA

- Water: introduce irrigation and water storage technology
- Cropping system: crop rotation
- Development of drought resistant and pest resistant varieties
- arable land available: agroforestry, land use policy/planning (zoning and tenure)

4. Appraisal and Visioning

- Development pathways
- Multi Stakeholder consultation
- Appraisal and ranking of adaptation (eg. MCA)
- Implementation

Challenges:

- Envisioning the different development pathways
- Buy in from politicians to implement adaptation options
- Funding for implementation



Contents of a NAP document

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REFERENCES

MDC / SDC
National Policies, Plans, Regulations
NAPs Guideline
VA Report
National Communication
INDC
IPCC Report / Country Assessment Report
National Climate Change Strategy
NAPA, LAPA Document
National Development Plan
Other climate change [reports?] and related policy
National plans

