



Water in Bhutan's Economy

Risks and opportunities for a sustainable future

Bhutan is poised at a critical moment in its development path. Having grown from a Least Developed Country (LDC) to a middle-income economy, having successfully transitioned to a parliamentary democracy, and having made significant strides in raising income levels without sparking income inequality, it now looks to continue shaping a prosperous future for its people and play a strategic leadership role in the regional environmental narrative.

As the country designs its future, it has the ability to follow several distinct development pathways. This is nowhere more true than in the context of water resources. Actions taken by Bhutan's government today have the ability to fundamentally alter the trajectory of freshwater availability and quality in the country, which in turn will have significant economic consequences.

It is in this context that understanding the role of "Water" in Bhutan's Economy along with the associated risks and opportunities becomes vital for the country's sustainable future. This is especially important for the key decision makers across the different sectors of the Royal Government of Bhutan to understand the role of freshwater resources in the country's economy, and become acquainted with key actions that can help preserve this natural capital. Otherwise, Bhutan may have to correct unsustainable practices and redress negative externalities down the line.

The 18-month water risks and scenarios process for Bhutan began in November 2014 as part of the regional exercise under the WWF Living Himalayas Initiative. In Bhutan, WWF partnered with the National Environment Commission (NEC), Royal Government of Bhutan which has the mandate for coordination of water resources management in the country as a local technical partner.

The main focus of the exercise was to take the "water out of the water box" and develop compelling narratives around future scenarios in terms of how the economies in the region are exposed to risks through water, which is the most strategic resource in the region.

Water is Agriculture

Over 90%
of water used in Bhutan is in the Agricultural Sector.

Water is Power

A Fifth
of Bhutan's GDP results from hydropower revenue.

Key Objectives

- To provide a sound understanding of current and future ecological and biophysical opportunities and risks in the Eastern Himalayas
- To highlight the social and economic implications and interconnections of these risks for Bhutan, Nepal and India
- To describe resilient development pathways in the Himalayan stretches of the Brahmaputra and the Ganges basins
- To convene diverse actors across Eastern Himalayas towards commitment for shared management, development and conservation

1. The process in Bhutan

- Risk Narratives Nov 2014 to April 2015**
 - Scoping of water and the economy for Bhutan
 - Developing draft risk narratives
 - Collaborative narrative building process with key influencers
 - Identifying compelling issues and levers to drive futures
- Scenario Development May to Sept 2015**
 - Collaborative scenario building process with key influencers
 - Identifying compelling scenarios and levers to drive action per basin
 - Production of a major report to communicate insights
- Communication & Engagement Oct to Dec 2015 & beyond**
 - Dissemination of findings to a broader stakeholder group
 - Engage ongoing policy initiatives
 - Convene and mobilise collective action initiatives

2. Threats to Bhutan's Water Resources

- Climate Change
- Inadequate Watershed Management
- Linear Infrastructure Development
- Hydropower Expansion
- Agricultural Intensification
- Urbanization and Industrialization
- Institutional Capacity Challenges

3. Range of Risks Arising from the Threats

- Flash Floods
- Landslides
- GLOFs
- Water Shortages
- Reputational / Brand Risk
- Loss of Biodiversity
- Sedimentation
- Drying Streams / Dry Seasonal Low Flows
- Water Quality Challenges / Pollution

4. Three plausible Scenarios

- Green Bhutan**
 - Growth in hubs
 - Industry driving growth
 - Industrial parts and surrounding settlements draw water
 - Water quality impacts grow
 - Industry is green and low carbon
- Brand Bhutan**
 - Decentralised growth
 - Agriculture and tourism driving the economy
 - Happy / natural brand leveraged for commodity export
 - Nature and ecotourism key
 - Watershed impacts grow
- Hydro Bhutan**
 - Centralised growth
 - Hydropower driving economy
 - 20 GW by 2035
 - Increase in storage dams
 - Environmental impact rise
 - Cumulative impact Assessment key
 - Distributed microhydro

Water related tradeoffs

- Assurance of water supply / reliability / access
- Downstream protection against water degradation
- Watershed integrity and stability
- Disaster management
- Spatial overlays / conflicts

5. Where are the expected trade-offs?

- Context constraints**
- Information on impacts
 - Maintaining the Bhutan brand
 - Source of finance / investment
 - Institutional capacity / fragmentation
 - Export focus versus Domestic consumption

	2015 - 2020	2020 - 2025	2025 - 2035	Assumptions
GREEN BHUTAN	Siting Regulation Stewardship Markets/sectors	Urban demand for processed goods Hydro plays supporting role Shift towards Green Economy (transformational low carbon economy) Export-orientation; competitive adv.	Impacts on water quality Strong regulation of water quality; need for better siting Investment in water technology + infra F&B partnerships Industrial brand Equity tensions Disaster management = flood zoning	Nodal growth Cheap electricity is competitive adv. for industry Value-addition and processing receive consideration in decision making
BRAND BHUTAN	Investments Models Incentives Markets/crops	Linear infra grows to support tourism Forest cover and watershed impacts (sediment for hydro) Shift to market-based agriculture + niche products Agriculture subsidies + irrigation investment Hydro as support; circumspect growth	Mechanized agriculture with niche exports to global markets Strong rural development model; more water supply Regional dry ports Impacts on forest cover + watersheds Disaster Management = landslides	Decentralization Growth in tourism Retain emphasis on high value tourism Commitment to food self-sufficiency Nature-based economy.
HYDRO BHUTAN	Finance Zonation Markets Impacts/benefits	Implementation of CIA, basin and spatial optimization Conversations emerge about local benefit sharing consequences Move towards redistributive model	Rethinking of financing + supply; move to regional markets Long-term trade goals (peak sales) Hydro as support to other economic sectors Disaster Management = river floods, GLOFs	20 GW by 2035 Growth of storage Regional market Hydro receives major consideration in decision making

Who's been on the journey

- National Environment Commission (NEC) and WWF leading, with support from Pegasys consultancy
- Department of Roads, Department of Human Settlement, Department of Engineering Services under the Ministry of Works and Human Settlement.
 - Department of Hydropower and Power Systems, Department of Hydromet Services, Department of Geology and Mines and Department of Cottage and Small Industries under the Ministry of Economic Affairs.
 - Department of Forests and Park Services, Department of Agriculture, National Biodiversity Center and Policy and Planning Division under the Ministry of Agriculture and Forests
 - Department of Disaster Management, Ministry of Home and Cultural Affairs
 - Department of Public Health under the Ministry of Health.
 - Gross National Happiness Commission
 - National Land Commission
 - Druk Green Power Corporation Limited
 - Tourism Council of Bhutan
 - Royal Society for Protection of Nature Bhutan Foundation
 - Bhutan Trust Fund for Environmental Conservation
 - The World Bank
 - United Nations Development Programme
 - Asian Development Bank and Integrated River Basin Management team leader

Recommendations

Spatial Planning	Information Requirements	Management Instruments	New Partnerships
Tradeoffs between economic trajectories Basin water planning and commutative impacts assessment	Environmental & social impacts Economic tradeoffs around water	Allocation / authorisation of water Water protection / zonation Early warning systems Watershed management	Investment partners Strengthening government Stewardship partnerships
Aligned / Coherent decisions	Informed / reliable decisions	Appropriate / sustainable decisions	Effective / efficient decisions
Deliberate, conscious, strategic planning and direction of varied development in different regions	Using best available information for decisions in a coordinated, aligned way across departments	Integrating water related decision support tools approaches in wider economic planning	Establishing / leveraging existing networks, including civil society and private sector, especially for finance

Opportunities for integration

- Bhutan's next five-year plan (2018-2023)
- Revision of Bhutan's Vision 2020 and formulation of Bhutan's Vision 2030
- Revision of the National Environment Strategy and Environmental Assessment Act
- Revision of the Power Sector Master Plan
- Revision of the Irrigation Master Plan
- Revision of other sector development plans

Next Step

- Platform for continued engagement and partnership lead by NEC.
- WWF committed to continuing the process of engagement and using the Water Risks and Scenarios process and outcomes as launching pads for defining projects, research and partnerships.

Key message

- Different sectors decisions have implications directly or indirectly for the country's water resources
- These decisions are, in effect, decisions about the future of Bhutan's most vital economic resource "Freshwater" hence about Bhutan's economic future.
- Understanding the key implications is important to take decisions with foresight, and with a strong understanding of trade-offs between any one chosen pathway and another.
- In order to minimize the chances of unintended consequences on Bhutan's natural capital – particularly its freshwater systems – there is a need for more holistic, inter-connected economic planning, and for actively integrating considerations about Bhutan's water resources into different sectors decision-making processes.

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