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Saving Shangri-la: Bhutan in the Wake of Climate Change and Disasters



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Presentation Outline

Video Presentation: Bhutan in the Wake of
Climate Change and Disasters

Bhutan: Climate Change and Disasters

Building Disaster and Climate Change Resilience

Towards a Mountain Countries Cooperation

19 22:03

An aerial photograph of a river valley. The river flows from the top center towards the bottom right. The valley is filled with a patchwork of green and yellow fields, likely representing different crops or stages of growth. In the lower right, a small town or village is visible with several buildings. The background shows rolling hills and mountains under a clear blue sky.

Video Presentation



Country Profile

- ✓ Total land area: 38,816 sq km
- ✓ Location: South East Asia (Eastern Himalayas)
- ✓ Topography: Mountainous terrain (200 – 7000 meters)
- ✓ Forest cover: 72.5% of the total land area
- ✓ Total population: approximately 700,000
- ✓ Development philosophy: Gross National Happiness
- ✓ Main economy: Hydropower & Agriculture





Bhutan: One of the Most Vulnerable Countries to Climate Change and its impacts

- ▶ High dependence on climate sensitive sectors,
 - ▶ Agriculture and hydropower
- ▶ Level of economic development
 - ▶ ~ 70% population engaged in subsistence agriculture
- ▶ Geography
 - ▶ Fragile mountain ecosystem.
 - ▶ Earthquake (seismic zone 4 and 5)
 - ▶ Increased risk of disasters (GLOF and flash floods, drought, forest fires, landslides)



Potential Impacts of Climate Change

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.



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



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.



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



Human Health:

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





Impacts of Climate Change: forest & biodiversity

- **Species and ecosystems shift to higher elevation (JDNP 4200m)**
- **Occurrence of pests, diseases and fire**
- **Agriculture biodiversity change**

Alas ! if my friend could understand that , I don't have any choice either!

How can we live in harmony , if Your Excellency keeps on pushing north?



The march to higher ground!

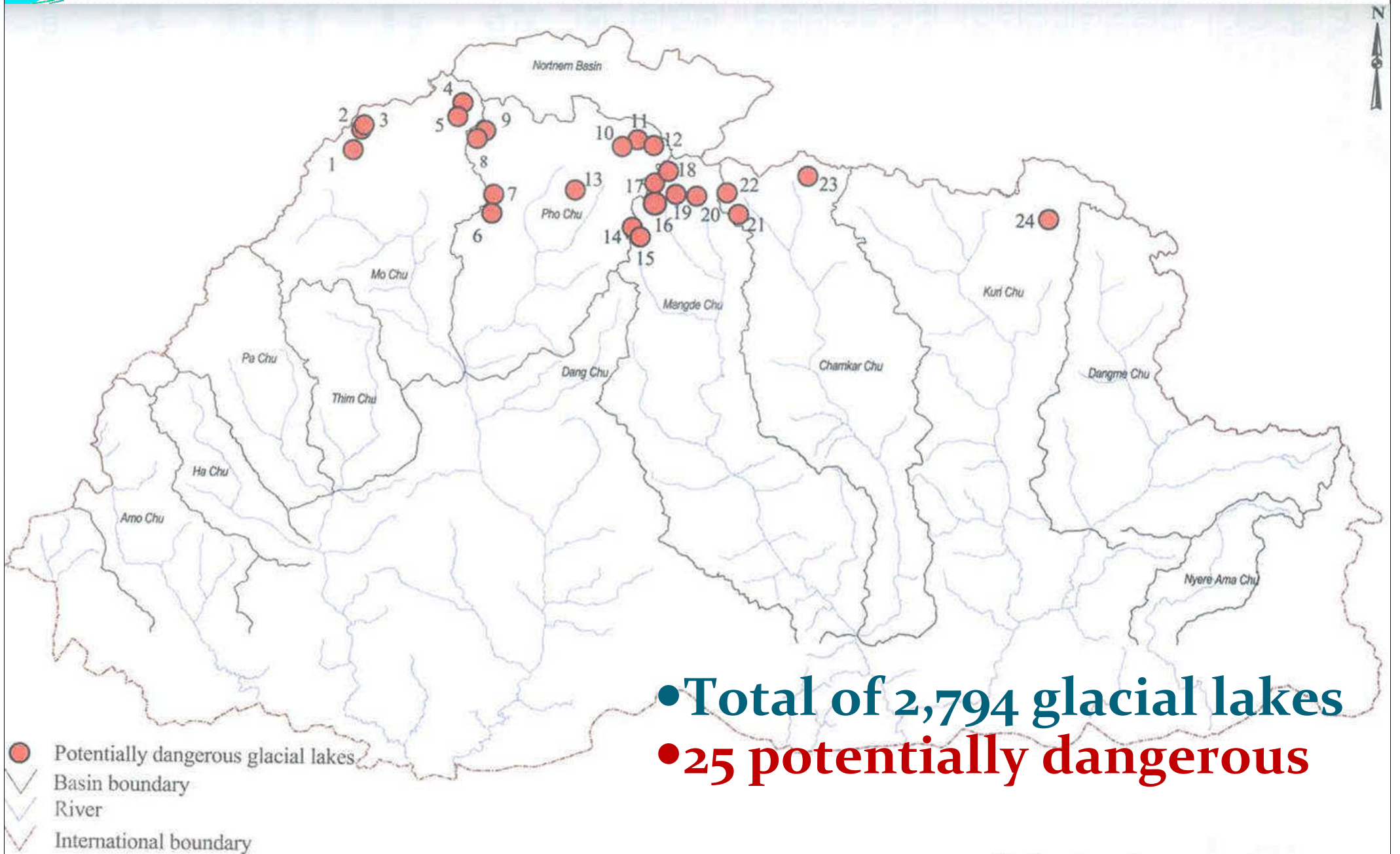
Impacts of Climate Change: Water resources

- Accelerated melting of glaciers
- Formation of Glacial Lakes and GLOF
- Changes in hydrological cycle
- Extreme Climate: flooding and dry spells
- Impacts on Hydropower





Glaciers and Glacial Lakes



- Total of 2,794 glacial lakes
- 25 potentially dangerous

Number of potentially dangerous glacial lakes = 24



Glacier retreat in Bhutan

Repeat photography

Northern side of Rinchen-zoe La

- In 1984, no water body
- After the formation of Lake, rapid retreat observed

Photo by Prof. Tsukihara



1999 Photo by Dr. Naito

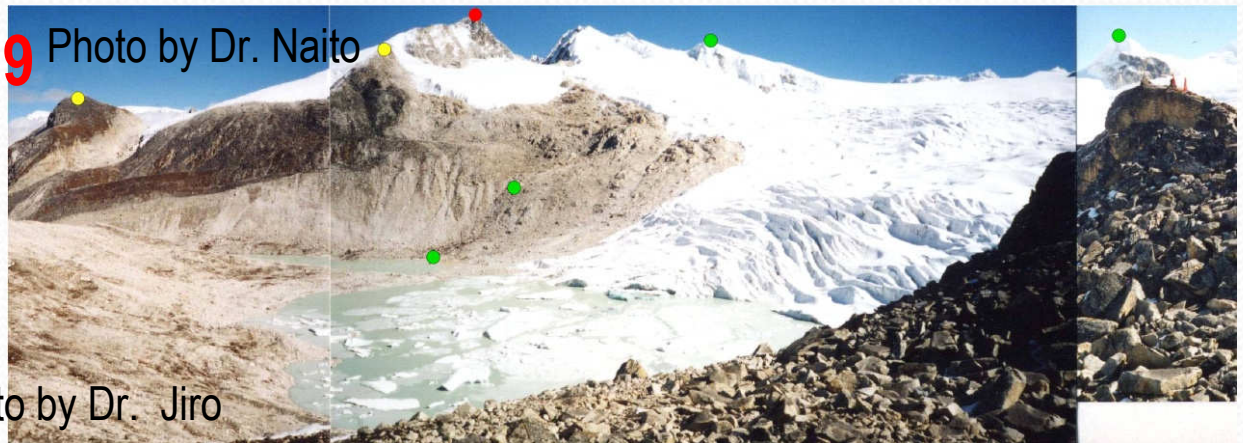
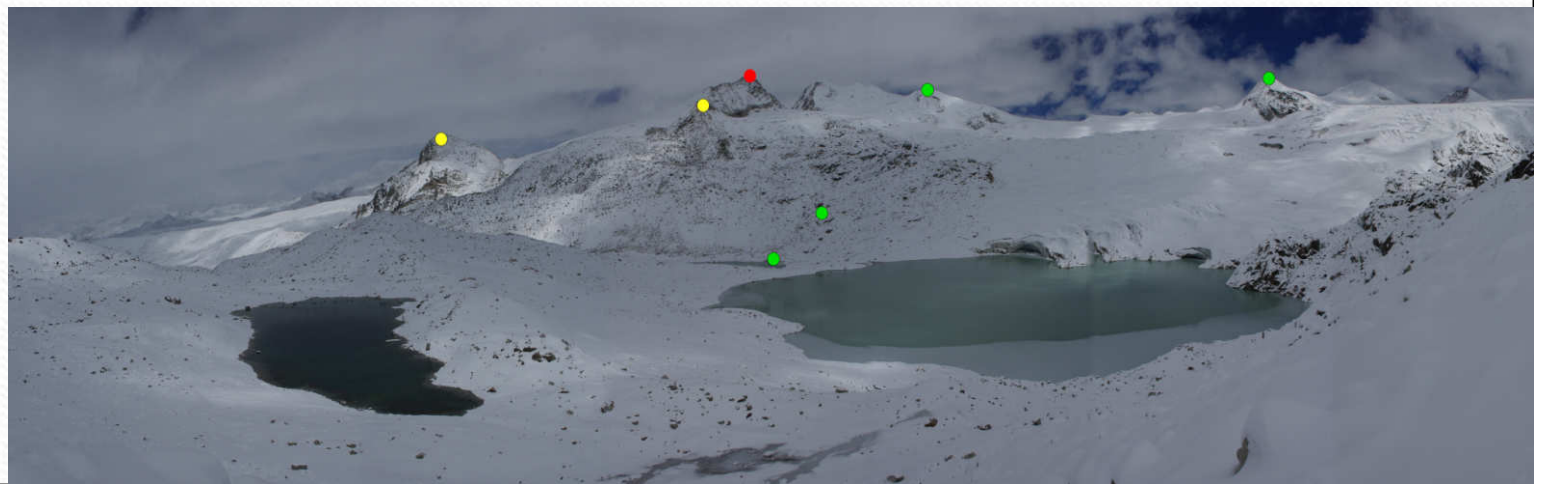


Photo by Dr. Jiro

2009

- Roughly 500m retreat in 25 years (high retreat rate)





Building Resilience to Disasters and Climate Change





Bhutan's Development Philosophy

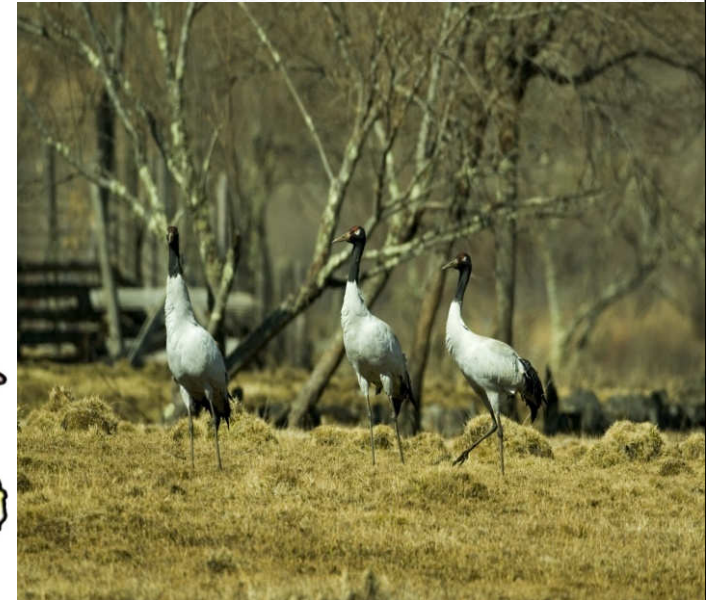
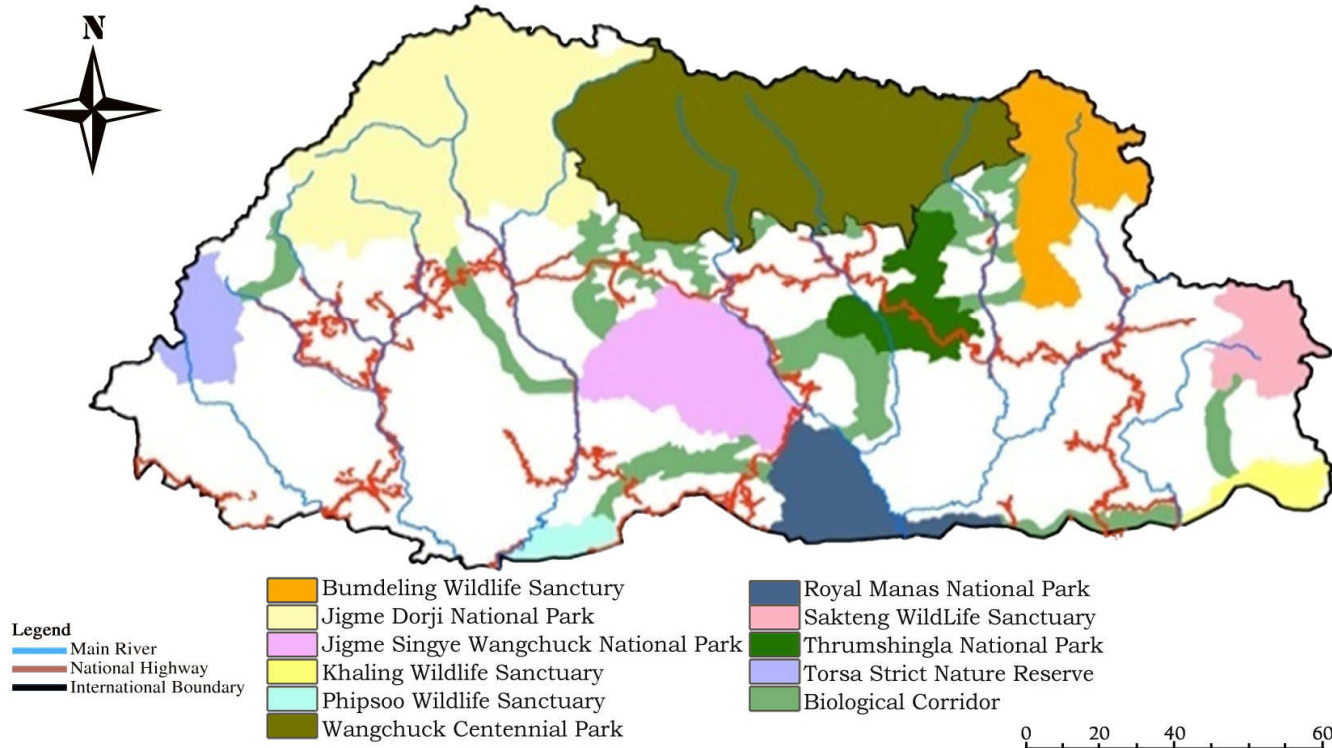


- **Gross National Happiness** :
“*Middle Path*” Development Philosophy
“*Balancing economic returns with conservation of environment & Cultural heritages*”
Characterized : **Conservation of Environment**, and **Preservation of Culture and tradition** as two of the four pillar of GNH
- Constitution mandates:
“*60% forest cover for all times to come*”



Sustainable Forests

NATIONAL PROTECTED AREAS AND BIOLOGICAL CORRIDORS OF BHUTAN



Total Forest Cover : 72.5% of Total Area

Total % of protected area: 51.44 %

Ban on export of timber in early 1990's



GLOF and Ongoing Work

- Glacial lake Mitigation
(*artificial lowering of water level in Thorthormi lake*)
- Hazard zonation & Identification of Evacuation Sites
- Installation of Automatic Early Warning System
- Awareness and Advocacy
(*vulnerable communities*)





Building Resilience to Disasters and CC (contd..)

- Landslide Management & Flood Prevention (*Pilot Schemes in Critical Areas*)
- Rainwater Harvesting
- Community-based Forest/Fire Management
- Improving Nomad Livelihoods (*Brokpa Program*)
- Focus on Clean Development Mechanisms (*hydropower, wind energy, solar energy*)
- Commitment to remain Carbon neutral for all times to come (**COP 15**)
- Establishment of Department of Disaster Management (2008)
- International Conference on Disaster Management and Cultural Heritage



REGIONAL ACTION

Summit for a Living Himalayas

Political commitment at the highest level for cooperation within the sub-region highlighted in a Summit Declaration for:



- Securing **biodiversity** and ensuring its sustainable use
- Ensuring **food security** and securing livelihoods;
- Securing the **Natural Freshwater Systems** of the Himalayas; and
- Ensuring **energy security** and enhancing **alternate technologies**

Led By Royal Government of Bhutan

Partners : MacArthur, ICIMOD, WWF, IFAD, DANIDA





A Bridge Across the Rooftops : Towards Mountain Cooperation

Key Focus Area:

- Knowledge sharing
- Technology Transfer

What Bhutan can offer to the cooperation:

- Forest and biodiversity conservation : Experiences and best practices
- Culture and Environment:
- Local Best Practices on sustainable land management practices



Benefits from the Cooperation

- Clean development technologies (Renewable Energy)
- Archiving of Traditional Knowledge on CC
- Community based disaster management practices
- Scientific knowledge on Glaciers and GLOF
- Capacity building on Climate Change mitigation and adaptation



A large group of children, likely in Bhutan, are gathered together, looking towards the camera. They are wearing traditional Bhutanese clothing, including colorful shawls and hats. The children are of various ages, from young children to teenagers. The background is slightly blurred, showing more children and possibly a building.

*“Reducing Disaster Risks for
Safe and Happy Bhutan”*

TASHI DELEK (THANK YOU)