Webinar: Report Launch on
“Inventory of Glacial Lakes and Identifications of Potentially Dangerous Glacial Lakes in Nepal, the TAR, China, and India”

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Joint Initiative of UNDP and ICIMOD on Updating Glacial Lakes in the context of changing climate

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Outlines

• Nepal’s Vulnerability in the face of Climate Change
• Temperature rise and Glacier Melting
• Glacial Lake Outbursts Floods in Nepal
• Nepal’s Priority for Climate Risk Management
• Preparing Nepal’s Second GLOF Project for GCF Submission
• Rationale and Scope of the Study
• Conclusion
A changing climate results in unprecedented extremes with high frequency, intensity, spatial extent (IPCC/SREX, 2012);

Nepal loses 333 lives and property worth over USD 17.24 million (NPR 2,099 million) each year to extreme climate events, Nepal Disaster Report, MoHA 2019);

One of the biggest climate risk in high mountain area is from accelerated glacier retreat and expansion of glacial lakes which potentially results into GLOFs.
Temperature rise and Glacier Melting

- Nepal’s Average temperature increment is 0.056°C/yr and a higher warming rate of 0.086°C/yr in the Higher Himalaya over the period of 1971–2014 (DHM 2017);

- Warming in HKH region will likely be at least 0.3°C higher even if the global warming is kept to 1.5°C by the end of 21st century and even more pronounced in mountain ranges (Wester et. al. 2019);

- The Mass budget of Himalayan glaciers has decreased over the last five decades (AR5-(IPCC) and it projects a continuous loss of glacier mass through the 21st century (Jimenez Cisneros et al. 2014);
Temperature rise and Glacier Melting

- **Glacier** areas in **Nepal decreased by 24%** in the 33 years between 1977 and 2010 (Bajracharya et al. 2014a, 2014b);

- **Imja glacier** showed the highest rate of retreat among Nepal's glaciers, of **74 m/yr over 2001–2006** (Bajracharya et al. 2007);

- **Trakarding glacier** retreated at **66 m/yr** between 1957–2000 (Chapagain et al. 2010) and an average shrink of **40 meters** between 1964–2018 (Krause et al., 2019);

- Global glacier lake **volume** increased by around **48%**, and increment of **lake numbers** by **53%** and **total area** by **51%** between 1990 and 2018 (Nature Climate Change 2020).
Glacial Lake Outbursts Flood in Nepal

- Altogether **26 GLOF events** impacted Nepal (15 in Nepal (Recent: April 2017), 11 GLOFs originated from Tibet Region (Recent: July 2016)

- **Dig Tsho GLOF, 1985** caused casualties and resulted in an estimated economic loss of **US$ 1.5 million** (Horstmann 2004; Mool et al. 2001a);

- In 1977, a GLOF was recorded in Dudh Koshi, causing 2–3 casualties (Agrawala et al. 2003);

- The **Zhangzangbo–cho GLOF** in the TAR, China, July 1981, causes a loss of US$ 3 million (Mool et al. 2001);

- The total **Value at risk** under the modelled GLOF scenario of Thulagi is USD 406.73 million (Khanal et al. 2015).
Nepal’s Priority of Climate Risk Management

Climate Risks Management: GL Risk Reductions to save lives and livelihoods

• Nepal’s Constitution

• **NAPA (2010), NDC/e-NDC (ongoing)** – (Parties to the UNFCCC /Paris Agreement), **NAP (ongoing)**


• **NPC’s Periodic Plans** - Agenda 2030 for Sustainable Development (Prosperity, People and Planet - 11 Goals - more specific goal no 13 on CC.)
Preparation for Nepal’s Second GLOF project for GCF Submission

- UNDP’s core mandate of Sustainable Development and Resilience Building
- Part of UN Sustainable Development Framework;
- UNDP’s CPD Priority
- Comparative Advantages: Past experiences (Imja and Tsho Rolpa Glacial Lakes);
- Sustained Partnership with Govt. on Policy and institutional support; (guided by country programme).
“Protecting Livelihoods and Assets at Risk from Climate Change Induced Flooding in Glaciated River Basins of Nepal”

• Safeguarding the lives and livelihoods of **327,500 people** and their physical and economic assets, from the climate-induced threat of GLOFs and related hazards;

**Project Outcomes and Outputs:**

**Increased Resilience and enhanced livelihoods of the most climate vulnerable people through climate resilient interventions**

**Output 1** - Institutions strengthened to deliver climate risk information, monitoring and early warning services to local populations and productive sectors of economy

**Output 2** - Investment in GLOF and Flood risk reduction strategies at the watershed level scaled-up

**Project partners:** Lead: Department of Hydrology Meteorology (DHM) / MoEWRI

**Thematic Leads:** MoFE’s DFSC and DNPWC

**Collaborating Partners:** Other relevant ministries and departments, Academia and Research Institutions
- Monitoring Station
- GLOF Risk Reductions
- Monitoring Station/Early Warning System
- Community Based Climate Risk Management Interventions
Rationale of the Study

During the project formulation, following gaps were identified:

• Need a study/research to update the previous studies of 2011 for current status of Glaciers, GL and glaciated basins;

• Need to generate research-based evidence to understand Glacier, GL and GLOF Risk and its reduction to save lives and livelihoods;

• Need to update Mapping and Hazard assessment of Glaciers and Glacial Lakes periodically due to dynamic nature;

• Need an updated database, detailed assessment/analysis on Snow, Glacier, Glacial Lakes and GLOG Risk to make the proposal stronger;

This study was carried out under GCF Readiness Programme for Nepal— with the support of BMUB/Germany.
UNDP partnered with ICIMOD as a trusted, knowledge and research-based institution on climate change to fulfill these gaps to support GCF project formulation:

• Carry out an **analytic assessment of Glacial Lakes** of Nepal and TAR, China to understand **high mountain climate risks** particularly arising from critical glacial lakes of Nepal;

• Prepare a **new inventory of glacial lakes** of Nepal, **re-categorize and identify potentially critical glacial lakes** in Nepal, TAR, China (potentially affecting Nepal) with their ranking;

• Provide necessary data of all critical glacial lakes to run the **dam breach model** (5 m DEM based data ) to prepare the GLOF **hazard and risk maps**.
Conclusion

• Study Report contributes significantly to fill the knowledge gaps with:
  • Updated database on GL numbers (other various parameters), identifications of critical lakes;
  • Build Climate rationale and define theory of change;
• A good resource for wider stakeholders;
• Nepal will submit the Full Funding Proposal on GLOF RR to GCF in Mid 2021.
Thank You for your Attention!!!

Photos – Deepak KC except that of Slide 4 and 6 (Bhotekoshi damage), facts/figures - Sources acknowledged.