



SAVING  
LIVES  
CHANGING  
LIVES

# Disaster Risk Reduction in Bhutan

*Greater resilience to natural disasters and climate crisis*

## Hazard and capacity overview

Bhutan is prone to natural hazards like earthquakes, floods, glacial lake outburst floods, landslides and forest fires. Making substantial progress in disaster risk reduction, the Royal Government of Bhutan has through its 2013 Disaster Management Act established the National Disaster Management Authority and Disaster Management Committees in all 20 districts. These districts also have a Disaster Management Contingency Plan (DMCP) in place. With the country facing increased risks of multiple natural hazards, capacity strengthening, upgraded data systems and increased awareness are a priority for the government. A disaster impacting Bhutan today, as the country faces the socio-economic pressure of COVID-19 and other global crises, would have devastating impacts on the country and its people.

## Focus and partners

The WFP Bhutan Country Strategic Plan (2019-2023) identifies enhancing resilience to natural disasters and climate change as a key focus area. WFP is the UN lead on disaster risk reduction (DRR) in the country and supports coordination between development partners through regular sector meetings and knowledge sharing platforms. To develop stronger national resilience to disasters and the climate crisis, WFP supports the Royal Government of Bhutan's (RGoB) DRR initiatives in the five areas of governance and coordination, data preparedness, logistics, emergency telecommunications, and food security.

## Governance and coordination

To enhance governance and coordination in DRR, WFP and the Department of Disaster Management (DDM), in consultation with relevant government stakeholders, are completing the Roadmap for Disaster Risk Management (2022-2026). The roadmap comprises Bhutan's hazard profile, national preparedness level, and actions to strengthen the RGoB's DRR framework, systems, and institutional coordination. It also mainstreams DRR in development planning, budgeting and implementation to enhance national disaster preparedness and response capacity.

WFP, with DDM, supports national and regional multi-hazard simulation exercises, and development of DMCPs at the national and district levels. These exercises help understand current gaps, identify areas for strengthening implementation of DMCPs, and aim to strengthen capacity and technical skills of disaster management officers.

## Data preparedness

To strengthen DRR data preparedness, WFP is supporting the RGoB in the 72-hour rapid assessment approach and building a digital vulnerability database. This assistance will help estimate the likely impact of a disaster and enable a response within 72 hours.

The 72-hour approach provides critical information based on a pre-disaster vulnerability database, which includes information on demographics, poverty, food insecurity, access to roads, health stations and schools, combined with data from tactual disaster events, such as the 2009 earthquake in Bhutan. This offers a basis to make operational decisions even in extremely complex situations with information being refined through continuous updates.

WFP, in partnership with DDM, is currently upgrading the 72-hour approach using WFP's platform for real-time impact and situation monitoring (PRISM). PRISM automates the 72-hour approach, utilizes data from existing systems and overlays information from satellites, drones, and other data systems, to enhance disaster impact analysis and facilitate a rapid lifesaving response.

## Drone technology and remote sensing

Globally, WFP uses drones for data collection, cargo delivery and connectivity and is working on several projects to integrate machine learning with drone technology. As part of WFP's capacity strengthening assistance to governments, WFP trains government agencies and development partners in the use of drones for DRR and climate change monitoring. The training covers subjects such as drone technology,



use of drones for impact assessment and mapping (including glacial mapping), data analysis and image processing, drone policies and regulations, and drone flying. In 2021, WFP supported the National Land Commission Secretariat of Bhutan with a drone for strengthening of its early warning system.

### Earthquake impact assessment modelling

To strengthen earthquake data preparedness, WFP partnered with the U.K. universities of Durham and Newcastle to develop an impact assessment model of earthquakes for Bhutan.

Completed in October 2020, the modelling presents quantifiable earthquake impacts in 110 possible scenarios, such as fatalities, casualties, and displaced persons. Populations living in the Himalayan region are the most at-risk for major earthquake disasters. In Bhutan's worst-case scenario, an earthquake with a magnitude of 8.5 on the Richter scale may result in approximately 9,000 fatalities, 10,000 people with serious injuries, and 45,000 people displaced nationally. There are five different scenarios in which over 5,000 fatalities occur nationally.

WFP and DDM are working with national partners to identify earthquake preparedness and mitigation measures across eight clusters of public order, food security, health, logistics, WASH, housing, emergency telecommunications, power, and energy. Measures, such as reinforcing buildings and prepositioning of water, food, and health supplies to remote areas to save lives and livelihoods, and building stronger national earthquake resilience were identified. A national multiple hazard disaster simulation exercise will further elaborate, and WFP will build the capacities of DDM and relevant government officials in carrying out these simulation exercises.

### Glacial lakes outburst flood (GLOF) research

According to climate projections, the mean annual temperature in Bhutan will increase by 0.8 – 1°Celsius by 2039. This will increase the risk of climate crisis related disasters, such as GLOFs, with the potential to undermine the country's resilience and ability to safeguard lives, livelihoods and development progress.

WFP has partnered with Newcastle University on GLOF modelling for early warning. With 567 glacial lakes in Bhutan, the probability of GLOF occurrence in Bhutan is high. Thus, WFP seeks to quantify potential triggers, and subsequently undertake numerical modelling to translate GLOF hazards to downstream flood risks.

Bhutan is particularly vulnerable to GLOFs, as its population and hydropower infrastructure are largely concentrated downstream. This research will provide vital information to support early warning and prevention activities. It will also feed into the 72-hour approach and digital vulnerability database.

### Emergency telecommunications

Through leadership in the emergency telecommunication (ETC) working group, WFP works with partners to further strengthen the ETC sector. In 2019, WFP undertook an information and communications technology capacity assessment to identify priority actions that would ensure continuity of telecommunications during an emergency. Based on the findings, WFP, the RGoB and development partners drafted an ETC preparedness and response action plan.

WFP supports capacity development in emergency mobility and communication by strengthening the coordination capacity and communication platforms of frontline personnel. This includes equipping response hubs in the capital of Thimphu with appropriate communication materials and clear standard operating procedures for an effective disaster response.

### Food security

In 2020, WFP supported the RGoB on food security preparedness and response during the COVID-19 pandemic. This included assistance to the development of a National Food Security Emergency Action Plan for COVID-19, and development of standard operating procedures for targeting and food distribution. Under the RGoB's National Food Security Reserve, WFP supports the government and private partners on the management of food safety and quality assurance (FSQA). WFP also supports the development of national FSQA guidance, warehouse training on FSQA management, transportation, and provides financial assistance and infrastructure support.

To strengthen coordination, WFP is organizing a food security cluster with the Government and development partners. Further, WFP will support the Government by providing more clarity on the impacts of the climate emergency on livelihood and food security through its consolidated livelihood for analysing resilience (CLEAR) approach.

### COVID-19 response

WFP works closely with the Department for Disaster Management and government partners to support overall COVID-19 coordination and response in the areas of food security and logistics. This includes capacity support to frontline personnel, preparing for future pandemics, and supporting the National Food Security Reserve in securing sufficient food stocks for six months for the whole population.

