# Project Information Document/ Identification/Concept Stage (PID)

Concept Stage | Date Prepared/Updated: 16-Feb-2021 | Report No: PIDC232511

## BASIC INFORMATION

### A. Basic Project Data

| Project ID | Parent Project ID (if any) | Environmental and Social Risk Classification | Project Name |
|---|---|---|---|
| P175081 | | Low | Strengthening Risk Information for Disaster Resilience in Bhutan |
| **Region** | **Country** | **Date PID Prepared** | **Estimated Date of Approval** |
| SOUTH ASIA | Bhutan | 16-Feb-2021 | |
| **Financing Instrument** | **Borrower(s)** | **Implementing Agency** | |
| Investment Project Financing | The Kingdom of Bhutan | National Center for Hydrology and Meteorology, Department of Disaster Management, Ministry of Works and Human Settlements | |

## PROJECT FINANCING DATA (US$, Millions)

### SUMMARY

| | |
|---|---|
| **Total Project Cost** | 2.30 |
| **Total Financing** | 2.30 |
| **Financing Gap** | 0.00 |

### DETAILS

| **Non-World Bank Group Financing** | |
|---|---|
| Trust Funds | 2.30 |
| Climate Investment Funds | 2.30 |

### B. Introduction and Context

Country Context

**Bhutan has seen rapid development and economic growth in the past decade while preserving its unique geographical, historical, and cultural characteristics through the Gross National Happiness (GNH) concept**

**as the guiding principle of development.** A small, landlocked country nestled in the Himalayas, Bhutan has steep mountains, deep valleys, and scattered settlements. Much of the growth has been propelled by hydropower development, which have helped the government create fiscal space for investing in human and physical capital, allowing Bhutan to significantly improve services, education, and health. Since the early 1980s, real GDP has grown at an average annual rate of 7.5 percent, making Bhutan one of the fastest-growing countries in the world. With Gross National Income per capita of US$3,080 in 2018, the country is approaching the threshold for upper-middle-income countries. From 2007 to 2017, Bhutan reduced poverty by two-thirds, from 36 percent to 12 percent, based on the US$3.20/day poverty line.

**Bhutan is highly vulnerable to hydro-meteorological and seismic hazards, including flooding, landslides, glacial lake outbursts floods (GLOFs), earthquakes, landslides, cloudbursts, flash floods, windstorms and forest fires, a result of its geographical location and varied topography.** Floods and landslides pose major threats to people's lives, assets, and infrastructure every monsoon season. Between 1994 and 2016, some 87,000 people were affected and over 380 deaths occurred due to natural disasters in Bhutan. In 2009, Cyclone Aila brought unprecedented rainfall and floods, affecting farmland and infrastructure with damages of approximately US$17 million (1.2 percent of GDP). In 2009 and 2011, Bhutan was struck by two high-magnitude earthquakes with a damage and loss of US$52.6 million (4.3 percent of GDP) and US$24.5 million (1.4 percent of GDP) respectively. Climate change is increasing Bhutan's vulnerability, increasing its exposure to GLOFs. Climate change models indicate that Bhutan will experience rapid changes in weather patterns, with a temperature increase of over 1.9°C and a precipitation increase of more than 6 percent. Bhutan's 2011 Climate Change Vulnerability Assessment predicts a warming trend in annual temperature and high levels of variability and uncertainty in annual precipitation. These changes are expected to lead to shifts in seasonal stream flows, ecosystems, agricultural practices, and distributions of species, depending on habitat changes. Climate change will also affect Bhutan's water resources, which need to be actively managed to meet population and production needs.

**As Bhutan's urban population is projected to increase from 37.8 percent in 2017 to 56.8 percent by 2047 driven by rural-urban migration, people, assets, jobs and economic potential will increasingly concentrate in urban areas**. The majority of the country's infrastructure is located along drainage basins that are highly vulnerable to flooding, particularly riverine flooding caused by heavy monsoon rains and glacial melt. The country's urban areas are vulnerable to urban flooding due in part to inadequate planning of drainage systems and weak hydrometeorological information. Historical trends indicate that flooding is the most frequently occurring hazard and accounts for the largest percentage of mortality. Continued failure in integrating disaster and climate resilience into the built environment will inevitably pose a catastrophic threat to the country's ability to sustain growth and undermine the development effort of the Royal Government of Bhutan (RGOB).

## Sectoral and Institutional Context

**The RGOB has put in place a policy framework for integrating climate and disaster risk management (DRM) in development activities, but its practice and implementation are constrained by limited data, technical**

**capacity and financing**. Bhutan enacted its Disaster Management (DM) Act in 2013 and has a National DRM Strategy (2017) and a Roadmap for DRM (2019), which were prepared by the Department of Disaster Management (DDM) under the Ministry of Home and Cultural Affairs (MoHCA). These strategic documents are guided by the Five-Year Plans (FYP). The DRM strategy identifies priority actions for improving the understanding of disaster risks and strengthening risk governance system in accordance with the Sendai Framework for Disaster Risk Reduction. The roadmap provides a detailed plan for implementing the strategy, including planned activities, outputs, key performance indicators, timeframe and budget. However, the implementation of the strategy and roadmap has been constrained by the limited technical capacity and financial resources as well as the inadequate attention to sector-specific risk information needs.

**A key constraint in this regard has been the lack of institutional mechanisms fostering multi-agency coordination to allow for systematic and common approaches to data sharing and developing risk information and decision support**. Different technical departments and agencies are responsible for monitoring multiple hazards, assessing risk and vulnerability of communities, critical infrastructure and other assets, and undertaking mitigating actions to reduce their impact. Data is therefore disaggregated, scattered, not always digitized and not available in formats that allow for analyses. The absence of a user friendly, accessible, and reliable platform to share information and coordinate among the relevant stakeholders is leading to duplication of efforts and inefficient use of resources. The RGOB has recognized the urgent need for developing a common platform to bring together concerted efforts for enhancing and sharing risk information as well as a risk-based decision support system for identifying vulnerable communities and integrating risk information in planning and development. Similarly, with increased demand in meteorological and hydrological services, the National Center for Hydrology and Meteorology (NCHM) is faced with the challenge to regulate its data sharing and provision of services. Therefore, NCHM is currently formulating a National Hydrology and Meteorology Policy to ensure proper communication of weather, climate and hydrological hazards and to regulate the sharing of information. Such a policy will also institute the necessary authority and institutional arrangements to ensure follow-up actions after dissemination of information.

**Natural disasters could pose significant damage and constraints on essential services, including health systems which can be exacerbated by the absence of adequate risk information**. The pandemic has already revealed the significant stress put on the health systems, other critical infrastructure and public finances, hindering prompt and adequate health emergency response and recovery with risk of a prolonged recession. Natural disasters of any scale will add to the country's vulnerabilities further. Risk-based decision support and weather and climate information can help reduce the risks to vulnerable communities and economic assets and provide critical information for preparedness that can also enhance response in the case of health emergencies such as COVID-19.

**With more than half of the country's workforce remains in agriculture, which is highly vulnerable to climate change impacts, strengthening agrometeorological information is essential**. Agriculture in the country is dominated by rainfed dry land and wetland farming as most of the water sources are dependent on monsoon rainfalls. About two-thirds of the heads of poor households work in agriculture, compared to only about a third of non-poor household heads. The impact of climate change on the agriculture sector is

being manifested in the form of shortage of irrigation water, GLOF, flash floods, windstorms, erratic rains, outbreak of new pests and diseases, and increasing incidences of forest fire. While the reliability of NCHM's 3-day weather forecasts have improved over the last few years, provision of sector-oriented hydromet services is still limited. In addition, the rural farmers have limited access to reliable, accurate, and timely early warnings and risk information including COVID-19 outbreaks. Therefore, it is imperative to deliver adequate agromet advisories for improving and protecting the livelihood of farmers, including the development of effective mechanisms for communicating to the end beneficiaries, especially for high value crops.

**The country's construction industry is facing challenges in integrating risk information into infrastructure development and professionalizing the industry for promoting a quality-built environment**. The industry heavily relies on foreign workers and imported construction materials with an annual remittance of BTN12.76 billion (US$166.97 million). The 2016 Performance Audit of Disaster Management identified inadequate application of engineering design standards and lack of proper planning, design, and workmanship in construction works. To address this challenge, the 12th FYP aims to professionalize the country's construction sector through the enactment of the Construction Industry Act. In the interim, a National Construction Industry Policy was endorsed by the RGOB in February 2020. Under the planned Act, the Ministry of Works and Human Settlements (MoWHS) will establish the Engineering Council of Bhutan for registering, regulating, and professionalizing the country's 4,000 practitioners. In addition, the Construction Development Board (CDB) will be reestablished as the Construction Development Authority (CDA) under the planned Act to (i) strengthen the system for registration, certification, and licensing of more than 2,500 contractors; (ii) institute a mechanism to regulate and enforce strict compliance of the regulation, quality and standards; and (iii) carry out capacity building of contractors. Professionalization of the country's construction industry underpinned by institutional strengthening and capacity building of the Engineering Council and CDA is critical to enhancing the quality and resilience of Bhutan's built environment.



Relationship to CPF

**The proposed project is closely aligned with the World Bank Group (WBG)'s Bhutan Country Partnership Framework (CPF) for FY20-24.** The CPF presents an integrated framework of WBG support to help Bhutan achieve inclusive and sustainable development through private sector-led job creation. One of the strategic focus areas is resilience with a cross-cutting foundation on leveraging digital technologies to strengthen governance and implementation capacity. Reducing the vulnerability to natural disasters and climate change is critical for strengthening the livelihoods of low-income populations dependent on agriculture and competitiveness of affected sectors such as agriculture, roads and construction. The CPF recognizes that digital technologies and the use of such tools are critical part of DRM.

**The proposed activity is also aligned with the Royal Government of Bhutan's 12th Five-year Plan (FYP) for 2018-2023**. The objective of the 12th FYP is to create a "just, harmonious and sustainable society through enhanced decentralization". The proposed project will contribute to achieving the National Key Result Area

#6 on Carbon Neutrality, Climate and Disaster Resilience, #9 on Infrastructure, Communication and Public Services, #14 on Healthy and Caring Society, and #15 on Sustainable Human Settlements.

## C. Project Development Objective(s)

Proposed Development Objective(s)

To enhance the Royal Government of Bhutan's capacity in developing and using multi-hazard risk information for development planning in targeted sectors.

Key Results

The proposed project is expected to deliver the following key results:

- Multi-Hazard Risk Decision Support System developed and adopted for planning in targeted sectors.
- Implementation of Agromet Decision Support System enhanced for service delivery in targeted gewogs.
- Technical capacity of professionals enhanced for implementing quality construction.



## D. Preliminary Description

Activities/Components

The proposed project will be financed by the Pilot Program for Climate Resilience of the Climate Investment Fund and has the following components:

- Component A. Establishment of a Multi-hazard Risk Decision Support System;
- Component B. Strengthening Hydromet and Agromet Services Delivery; and
- Component C. Professionalization of the Construction Industry for Green and Resilient Built Environment.

Component A will provide national-level multi-hazard risk information, which will form the foundation for integrating risk information into targeted sectors such as agriculture (Component B) and construction (Component C). The project builds on the Bank's past and ongoing engagement in the country, including the Bhutan Hydromet Services and Disaster Resilience Project (P154477), Preparation of Strategic Program for Climate Resilience (P159600), a TA on Capacity Building for Climate Resilient Infrastructure (P158723), and Development Policy Financing (DPF) with Catastrophe Deferred Drawdown Option (Cat DDO) (P173008).

**Component A. Development of a Multi-Hazard Risk Decision Support (MHRDS) System (US$1.7 million)**

At the request of RGOB and with Bank technical assistance support, DDM is coordinating an activity on stocktaking of existing risk data, identification of design elements, and action planning for conducting a

nation-wide multi-hazard risk assessment. This component will build on DDM's effort and provide support on developing and establishing a functional MHRDS platform through the following activities:

*Development of MHRDS* – The project will conduct a nation-wide multi-hazard risk assessment with a focus on high-risk hazards (earthquakes, floods and landslides), priority sectors (e.g., agriculture, construction) and vulnerable communities. It will develop both web-based and mobile applications to better understand the climate and disaster risks that Bhutan faces. Learning from experiences in the region, the web-based application is expected to have a GIS based decision support system that determines potential impact and empowers policymakers, operational users of Incident Response System, sectoral users and community members with necessary early warning information for decision making during all phases of disaster management. The mobile application will help communicate alerts to local disaster managers and communities and receive feedback on alerts and actions taken on the ground. The project will explore a way to synchronize or link the National Statistics Bureau (NSB)'s Data Portal that has been recently developed with the MHRDS.

*Support the formulation of a National Disaster and Climate Risk Information Policy* – In order to sustain the efforts to enhance risk information and keep the risk-based decision support system updated and dynamic, the DDM recognizes the need to formulate a National Disaster and Climate Risk Information Policy. The findings and lessons learned from the MHRDS System development and the national level multi-hazard risk assessment for priority hazards are expected to inform the formulation of this policy. The policy is expected to guide improvement in collection, reliability and use of risk related data in development activities. It will also underpin the recent and ongoing investments in improving risk information such as the Disaster Management Information System managed by the DDM and the proposed MHRDS.

*Capacity building, advocacy, and implementation of the system at all levels* – This activity will support the rolling out of trainings at all levels including policymakers, implementing agencies, sectoral and private sector users, as well as community members on the use of the risk information and the decision support system and ways to respond to the alerts. Trainings will also be provided to enhance the capacity of the government officials to improve the multi-hazard risk assessment based on which the MHRDS can be further enhanced. The project will also develop Standard Operating Procedures (SOPs) to improve integration of risk information into plans at the Thromde and district levels and conduct pilots. The activity will also explore the potential for developing specialized applications for integrating risk information into critical private sector-driven areas (agribusiness, tourism, construction).

Support from the project will help RGOB (through the National Disaster Management Authority chaired by the Prime Minister) activate the Inter-Ministerial Taskforce (IMT). The DM Act defines that the IMT is responsible for reviewing (i) hazard zonation and vulnerability maps, (ii) disaster risk reduction and disaster management activities and (iii) national standards, guidelines, and SOPs for disaster management. The DDM will lead the formulation of the IMT who will review and approve the risk maps and information generated through the project. It will consist of technical experts from relevant agencies and ministries and chaired by the Head of the DDM.

**Component B. Strengthening Hydromet and Climate Services Delivery (US$300,000)**

This component will support the NCHM in formulating a National Hydrology and Meteorology Policy through organization of stakeholder consultations and workshops and support its implementation. NCHM is currently developing the National Hydrology and Meteorology Policy with technical support from the World Bank. It will provide a regulatory framework for the country allowing NCHM to: (i) enhance its provision of hydromet, climate and early warning services; (ii) ensure it retains a primary role in acquisition of such data and information; (iii) provide guidance for data use and sharing by others; (iv) promote quality-controlled methods for hydromet data measurement across agencies; and (v) systematize processes for early warning to ensure their integrity and accuracy. The policy is expected to ensure that weather forecasts and warnings of hydro-meteorological hazards and climate trends are authoritative, actionable and communicated such that the information is accessible by those at risk and those responsible for the safety and security of the communities. The policy will also support Bhutan in structuring regional collaboration for strengthening its capacity to deliver such services.

This component will also develop a technical guidance note to help NCHM prepare design and specifications for the planned dedicated 24/7 National Weather and Flood Warning Center. This technical note will include specifications for (i) room and space requirements along with minimal sizes required, (ii) electrical and communication outlets, (iii) equipment including on necessary backups, and (iv) internet connectivity and other telecommunication items. Since a public land is not yet allocated for the construction of the center, the engineering design and drawings will not be supported through the project. The NCHM will identify a public land in compliance with the development control regulations and avoid the environmentally and culturally protected areas.

In addition, this component will enhance the generation and use of disaster and climate risk information in the agriculture sector, with potential focus on high value crops, through delivery of agromet services at local levels for farm and water users (irrigations points). Activities will focus on the implementation of an agromet roadmap that has been prepared through RGOB request with Bank technical assistance. These will include (i) support for operationalizing the existing Agromet Decision Support System (ADSS [www.agromet.gov.bt/LandingPageInfo/landing_page]) that integrates weather forecasts to enable real-time monitoring and data analysis for enhancing agricultural production and farm management; (ii) design of SMS and mobile applications to share critical weather and COVID-19 information with farmers and farm-level vendors in remote areas (the mobile applications will enable receiving feedback from farmers as the end users, which will also ease the collection and transfer of data from farm levels and research centers into the ADSS); (iii) a targeted roadmap for disseminating these critical information through improved digital connectivity and network coverage in collaboration with the private sector; and (iv) design of a digital geospatial platform for mapping the scattered and fragmented landholdings, agroecological zones and dominant crops grown across the country to identify the priority vulnerable areas for climate services.

**Component C. Professionalization of the Construction Industry for Green and Resilient Built Environment (US$300,000)**

This component aims to build the capacity of the construction industry in integrating risk information into buildings and infrastructure designs, construction, and operation & maintenance (O&M). The project will mobilize a Bank-executed TA to MoWHS to support its effort in implementing the National Construction Industry Policy 2020 and National Housing Policy 2020, which lay the regulatory and institutional foundation for improving the quality of built environment in Bhutan. Based on international best practices and lessons learned, the TA will support the MoWHS in formulating (i) the National Construction Bill, (ii) a draft framework for the Engineering Council of Bhutan for registering and certifying professionals, (iii) recommendations on the Construction Quality Compliance Mechanism (CQCM) for regulating and enforcing strict compliance of quality and standards across all types of infrastructure and buildings in the country, (iv) a draft framework for guiding the resilient, green and affordable housing development.

The recipient-executed grant will be used to (i) formulate guidelines on quality infrastructure development to be adopted by the Engineering Council of Bhutan as per the National Construction Act; (ii) develop training curricula on CQCM and conduct training of trainers (TOT) and targeted training of government officials, practitioners and contractors; (iii) finalize and implement the CQCM through pilots and the development and adoption of a roadmap; (iv) design web-based and mobile applications for adopting CQCM nationwide. The CQCM is expected to consist of a standard quality assurance and quality control framework including stepwise processes, SOPs and checklists for managing, monitoring and auditing the quality of all types of infrastructure and buildings in the country.



## Environmental and Social Standards Relevance

### E. Relevant Standards

| ESS Standards | | Relevance |
|---|---|---|
| ESS 1 | Assessment and Management of Environmental and Social Risks and Impacts | Relevant |
| ESS 10 | Stakeholder Engagement and Information Disclosure | Relevant |
| ESS 2 | Labor and Working Conditions | Relevant |
| ESS 3 | Resource Efficiency and Pollution Prevention and Management | Not Currently Relevant |
| ESS 4 | Community Health and Safety | Not Currently Relevant |
| ESS 5 | Land Acquisition, Restrictions on Land Use and Involuntary Resettlement | Not Currently Relevant |
| ESS 6 | Biodiversity Conservation and Sustainable Management of Living Natural Resources | Not Currently Relevant |
| ESS 7 | Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities | Relevant |
| ESS 8 | Cultural Heritage | Not Currently Relevant |

| | | |
|---|---|---|
| ESS 9 | Financial Intermediaries | Not Currently Relevant |

**Legal Operational Policies**

| Safeguard Policies | Triggered | Explanation (Optional) |
|---|---|---|
| Projects on International Waterways OP 7.50 | No | |
| Projects in Disputed Areas OP 7.60 | No | |

Summary of Screening of Environmental and Social Risks and Impacts

This Small Grants project will involve activities such as supporting the formulation of policies, and strengthening borrower capacity. No construction related activities will be involved in this project. The Environmental and Social due diligence of the project concluded the E&S risk can be categorized as "Low".



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### Borrower/Client/Recipient

Borrower : The Kingdom of Bhutan

### Implementing Agencies

| | | | |
|---|---|---|---|
| Implementing Agency : | National Center for Hydrology and Meteorology | | |
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