



## CONCEPT NOTE

ON

NATIONAL METEOROLOGICAL AND HYDROLOGICAL POLICY

### **Focal Point Address**

Director

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Royal Government of Bhutan

Thimphu : Bhutan

## 1. Introduction

The concept note for a National Meteorological and Hydrological Policy is being submitted in line with the mandates and functions of the National Center for Hydrology and Meteorology and “Protocol for Policy Formulation” of Gross National Happiness Commission (GNHC).

## 2. Context and Background

Meteorological and hydrological hazards have a major impact on the lives and livelihoods of the people everywhere. An authoritative voice for warnings of weather, climate and hydrological hazards and an adequate and coordinated response for such warnings in support of safety of life, livelihood and property are essential and require the clear formulation of roles and responsibilities of all agencies and economic sectors to stop natural hazards becoming social and economic disasters.

The National Center for Hydrology and Meteorology (NCHM) was established as a scientific and technical autonomous agency of the Royal Government in 2016 with a mandate to undertake scientific and technological services in hydrology, water resources, meteorology, climatology, and cryosphere<sup>1</sup> to ensure the safety and socio-economic well-being of people and to support national and international needs. The long term hydro-met data and services are required for planning and development of infrastructures, protecting lives, livelihoods and property to support national needs for ecologically balanced and sustainable development. The Center was also created to streamline the agency’s mandates and functions to avoid duplication of functions amongst various agencies and to improve the efficiency and effectiveness in delivering scientific data and information. The Center comprises the four divisions of Meteorology, Hydrology, Cryosphere and Hydro-Met Operation. Bhutan Civil Aviation Authority (BCAA) has designated the NCHM as the National Aeronautic Meteorological Service Provider within Bhutan. Similarly, the National Disaster Management Authority (NDMA) designated the Center as hydro-met hazards early warning service provider in the country.

Bhutan is the member of the World Meteorological Organization (WMO). Currently, the Center is the designated national focal point of Bhutan with WMO and the Intergovernmental Panel for Climate Change (IPCC). The Head of Center is designated as the Permanent Representative (PR) of Bhutan with WMO. Therefore, the Center has national and international relevance for scientific assessment in support of policy formulation for adaptation and mitigation of impacts of climate change.

## 3. Rationale for Proposing the Policy

Since so many aspects of society are affected by meteorological and hydrological hazards, many countries have adopted policies to formalize the response to them and to ensure that forecasts and warnings of potential threats are authoritative, actionable, properly and timely communicated to those at risk and to those responsible for the safety and security of the People.

There is no directive from the Government of Bhutan to formulate a national meteorological and hydrological policy. However, the adoption of meteorological and

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<sup>1</sup> *Snow, glacier, permafrost and glacier lakes*

hydrological policies has been recognized as good practice by the WMO, and as a Member of WMO Bhutan should align with internationally agreed good practices such as development of policies or legal frameworks for managing meteorological and hydrological activities. Such policies are being established and implemented by developed countries <sup>2</sup>and many governments in South Asia. This would also help Bhutan align with important international agreements such as the Sendai Framework for Disaster Risk Reduction, various initiatives of WMO and meet the United Nations Sustainable Development Goals, seven of which (out of 17) related to poverty, hunger, health and well-being, gender equality, clean water, clean energy and climate action touch to varying degrees on meteorology and hydrology.

The International Civil Aviation Organization (ICAO) regulates the provision of aeronautical meteorological services in support of safety and economy of air navigation. As a Member State of ICAO, Bhutan is required to comply with these regulations. A policy would establish the legal foundation for the provision of aeronautical meteorological services.

Similarly, as a focal agency for WMO and IPCC, the policy would enable smooth engagement with international agencies and enhance international cooperation.

Many government agencies, economic sectors, educational institutions, the international and local communities require access to meteorological and hydrological data. In line with common practice in most countries, a clear data policy (as part of the Policy) is needed in Bhutan to clarify data issues and to define the types of data that are available openly, must be purchased, or are restricted.

Not addressing these important issues at a high level could have negative implications as regards public safety, security and well-being, as well as adherence to highest accepted international standards for production and dissemination of meteorological and hydrological data and information.

#### **4. Critique of current policy options and approaches**

There are currently no policies or legislations in place to govern the conduct of meteorological and hydrological activities in Bhutan. In the absence of such instruments, multiple agencies have set up observational sites without adherence to measurement standards.

Climate monitoring and climate change studies are compromised by relocation of observational stations without consideration for the integrity of the national climate records.

There is no framework for NCHM to defend the integrity of its own data or control data use by others. This could become a serious issue if a legal situation arises leading to a court case. Similarly, there is no mechanism to require other relevant agencies and departments to disseminate meteorological and hydrological information issued by NCHM even when there is a risk to lives or livelihoods.

The emergence of private meteorological service providers everywhere is a further source of concern that needs to be addressed. The Policy should provide for meteorological and hydrological activities carried out by other countries' organizations and individuals within the national territory while affirming the authority of the NCHM to approve such activities, thus preventing undermining of public services (and public trust). This will

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<sup>2</sup> *South Korea, Japan, USA, UK, etc.*

help NCHM to be able to protest the unauthorized activities (e.g., sharing of hydro-met data, issuing warnings of severe weather for the territory of Bhutan) of an external entity and conversely to allow external entities' activities as long as they are carried out lawfully and in agreement with the government regulations.

## **5. Policy recommendations**

The NCHM has formulated a number of goals, the most important of which includes:

- Providing fit-for-purpose forecast and warning services that meet users' requirements for safety of life, livelihood and property
- Building competence to provide sector-relevant information for socio-economic development and support the development of integrated environmental services to foster healthy communities and ecosystems
- Enhancing climate services to understand and adapt to climate-related risks.

To achieve these goals and in line with the proposed Policy, NCHM will establish a coherent strategic framework with a forward-looking focus on technical, scientific and human capacity development of the Centre.

Following are some of the key policy recommendations that the proposed National Meteorological and Hydrological Policy will aim to facilitate and provide basis for:

- a) Identify NCHM or succeeding agency as the primary source of public meteorological and hydrological information
- b) Ensure the sound development of meteorological and hydrological services
- c) Contribute to public safety and welfare, hydro-met disaster preparedness; secure traffic safety in air and on land, promote prosperity and international cooperation
- d) Provide clarity in the roles and responsibilities of various organizations and institutions engaged in observation, forecasting, services provision, disaster prevention, exploitation of climate resources, and research
- e) Establish hydro-met data sharing and exchange protocol
- f) Include hydro-met and climate information in national economic and social development plans and financial budgets
- g) Define the conditions for free public services
- h) Designate the NCHM or succeeding agency as the competent authority for meteorological and hydrological activities nationally (and sub-nationally), including the climate projection, production and communication of warnings; licensing other service providers that may operate in the country; and setting standards for observations among other things
- i) Co-ordinate and encourage research and development in Hydrology, Meteorology and Cryosphere Science
- j) Provide an approval process for meteorological, hydrological and Cryosphere activities carried out by other countries' organizations and individuals within the national territory affirming the authority of the Center to approve such activities
- k) Ensure sustainable construction and maintenance of national hydro-meteorological network and communication facilities
- l) Establish or adopt equipment standards by the government authority responsible so they are properly verified, maintained and calibrated
- m) Establish a unified system for forecasts and early warning levels for different hydro-met hazards
- n) Protect from interference radio frequencies designated for hydro meteorological use.

The Policy will have many socio-economic and cultural benefits by reducing the risk of meteorological hazards becoming disasters. This would be achieved by defining clear roles and responsibilities of all actors – better coordination among government departments; avoiding duplication of efforts and hence avoiding unnecessary use of resources; avoiding public confusion due to multiple sources of information; increased uptake and use of authoritative warnings by the public; earlier actions by government agencies to prevent disasters and hence minimizing the cost of disaster response. Similarly, economic performance can be increased through access to more reliable, quality-assured data and information.

The Policy itself will be prepared with financial support from the World Bank and hence will not require resources from the Government.

## **6. Integration of GNH and cross cutting issues**

By ensuring the sound development of meteorological and hydrological services, the Policy will contribute to streamlining warnings and early response to hazards and further reductions in disasters.

The Policy will support the understanding of the impact of weather, water and climate on the environment. Harmonizing the work of NCHM with other agencies that are engaged in similar activities to enhance effective and efficient monitoring of water and air quality/quantity.

The Policy will support the scientific work of NCHM in support of the National Policy on Climate Change to ensure that Bhutan plays its role in international efforts on climate change under the UNFCCC and strengthen coordination with other agencies.

Availability of reliable, long historical climate records and information with climate projection will provide clear decision support systems and tools for good governance for long term environmental conservation, planning and development for agriculture, hydropower, tourism, aviation, transport and other sectors. Incorporation of climate information in development planning would enable sustainable economic development, consequently contributing towards achieving the Gross National Happiness.

Given that health and climate are closely linked, the Policy will contribute to improved well-being of the population through better support to public health, e.g., investigating the role of weather and climate in outbreaks of vector-borne diseases such as malaria and dengue. Although NCHM already supports public health, this can be improved through the policy for timely issuance of early warning services for vector borne diseases. Similarly agriculture is directly impacted by climate, the Policy will contribute to enhanced productivity through improved agro-meteorological services.

Under the Policy, all men and women should benefit equally from access to information and decision support related to weather, climate and water and be able to better protect their own life and property, as well as those of their families.

By adhering to good international practices for the delivery of weather, water, climate and cryosphere services, Bhutan can take advantage of advances in ICT, which will be applicable more generally to the government and people of Bhutan – cloud computing, Big data, shared data facilities, etc. At a national level, the Policy will also facilitate access by NCHM to national facilities in satellite and fiber optics communication and to the government data center, resulting in enhanced efficiency and economy.

## 7. Process and indicative timeline

The Policy will be developed with the Technical Assistance of the World Bank, which has drafted Terms of Reference and provided to NCHM a preliminary synthesis of good policy practices of other countries.

No conflicts are envisaged in the development and application of the Policy, and the Policy will align with and complement other national policies.

The major stakeholders are listed below and have already been consulted on the formulation of the Policy:

1. Gross National Happiness Commission
2. National Environment Commission
3. Ministry of Agriculture and Forests
4. Department of Public Health, Ministry of Health
5. Department of Hydropower and Power Systems, Ministry of Economic Affairs,
6. Department of Disaster Management, Ministry of Home and Cultural Affairs
7. Department of Air Transport (DoAT), Ministry of Information and Communication
8. The Bhutan Civil Aviation Authority (BCAA)
9. The Media House

### Time Frame

Activity	Indicative Timeline
1. Consultation with stakeholders	October 2019
2. Drafting and submission of Concept Note to GNHC	October 2019
3. Review of Concept Note by GHNC	January 2020
4. Drafting of the National Meteorological and Hydrological Policy, and Policy Protocol	July 2020
5. Consultation with stakeholders on draft Policy	August 2020
6. Submission of draft Policy to GHNC	September 2020
7. Revisions of draft Policy based on feedback from GHNC and re-submission to GHNC	November 2020
8. Endorsement of the Policy by GHNC	December 2020

## 8. Major impediments or risks foreseen in the development of the policy

There are no impediments or significant risks in the development of the policy. Stakeholders consulted at the outset on the development of the Policy are supportive, but they will be further consulted to obtain their concurrence once the draft Policy has been developed. There are no environmental or socio-economic impacts of the proposed policy.