



WORLD
METEOROLOGICAL
ORGANIZATION



GFCS

GLOBAL FRAMEWORK FOR
CLIMATE SERVICES

Step-by-step Guidelines for Establishing a National Framework for Climate Services



WORLD
METEOROLOGICAL
ORGANIZATION



GFCS
GLOBAL FRAMEWORK FOR
CLIMATE SERVICES

Step-by-step Guidelines for Establishing a National Framework for Climate Services

EDITORIAL NOTE

METEOTERM, the WMO terminology database, may be consulted at http://www.wmo.int/pages/prog/lsp/meteoterm_wmo_en.html.

WMO-No. 1206

© World Meteorological Organization, 2018

The right of publication in print, electronic and any other form and in any language is reserved by WMO. Short extracts from WMO publications may be reproduced without authorization, provided that the complete source is clearly indicated. Editorial correspondence and requests to publish, reproduce or translate this publication in part or in whole should be addressed to:

Chairperson, Publications Board
World Meteorological Organization (WMO)
7 bis, avenue de la Paix
P.O. Box 2300
CH-1211 Geneva 2, Switzerland

Tel.: +41 (0) 22 730 84 03
Fax: +41 (0) 22 730 80 40
E-mail: publications@wmo.int

ISBN 978-92-63-11206-4

NOTE

The designations employed in WMO publications and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of WMO concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The mention of specific companies or products does not imply that they are endorsed or recommended by WMO in preference to others of a similar nature which are not mentioned or advertised.

The findings, interpretations and conclusions expressed in WMO publications with named authors are those of the authors alone and do not necessarily reflect those of WMO or its Members.

CONTENTS

	<i>Page</i>
1. INTRODUCTION	1
2. BACKGROUND	1
2.1 What are climate services?	1
2.1.1 Precept of co-production with users	2
2.1.2 Guidelines for providing climate services	2
2.1.3 Support to climate-smart decisions and their applications	3
2.1.4 Examples of user-tailored climate services	3
2.2 What is the Global Framework for Climate Services?	4
2.2.1 Goals of the Global Framework for Climate Services	4
2.2.2 Guiding principles of the Global Framework for Climate Services	5
2.2.3 Role of the Global Framework for Climate Services and its component pillars	5
2.2.4 Implementing the Global Framework for Climate Services pillars at the national level	6
2.3 What is a National Framework for Climate Services?	8
2.3.1 Lessons learned from initial implementation projects	10
2.3.2 Functions of a National Framework for Climate Services	10
2.3.3 National Framework for Climate Services Interministerial Steering Committee	11
3. ESTABLISHING A NATIONAL FRAMEWORK FOR CLIMATE SERVICES	12
3.1 Step 1: Assessing the baseline on climate services	12
3.1.1 Key stakeholders in climate services	13
3.1.2 Analysis of current user interface platforms, climate services and gaps	15
3.2 Step 2: Organizing a national stakeholder consultation workshop on climate services	17
3.2.1 Objectives of the national consultation workshop	17
3.2.2 Running the national consultation workshop	18
3.3 Step 3: Developing a national strategic plan and action plan for the National Framework for Climate Services	18
3.4 Step 4: Endorsing the national strategic plan and action plan for the National Framework for Climate Services	19
3.4.1 Pre-validation and final validation workshops	20
3.4.2 Resource mobilization to support activities of the National Framework for Climate Services	20
3.5 Step 5: Launching a National Framework for Climate Services	21
4. CONCLUSIONS	21
APPENDIX. STRATEGIC PLANNING TEMPLATE FOR USE BY A NATIONAL FRAMEWORK FOR CLIMATE SERVICES	23
ANNEX 1. QUESTIONNAIRE FOR BASELINE ASSESSMENT OF COUNTRY CAPACITIES TO DELIVER AND USE CLIMATE SERVICES	35
ANNEX 2. GUIDE FOR MAPPING STAKEHOLDERS TO INVITE TO NATIONAL CONSULTATIONS	43
ANNEX 3. EXAMPLE OF A USER INTERFACE PLATFORM	45
ANNEX 4. SAMPLE PROGRAMME FOR A NATIONAL CONSULTATION WORKSHOP ON CLIMATE SERVICES	46

ANNEX 5. EXAMPLE OF A NATIONAL FRAMEWORK FOR CLIMATE SERVICES	47
ANNEX 6. EXAMPLES OF GOVERNANCE STRUCTURES ADOPTED.....	48
ANNEX 7. SAMPLE TEMPLATE FOR A NATIONAL DECREE TO ESTABLISH A NATIONAL FRAMEWORK FOR CLIMATE SERVICES	50
REFERENCES	51

1. INTRODUCTION

This publication is intended to assist National Meteorological and Hydrological Services (NMHSs) and their partner institutions at a national level, engaged under the five pillars of the Global Framework for Climate Services (GFCS), to establish a National Framework for Climate Services (NFCS). Such a national framework aims to coordinate institutions and enable them to work together to co-design, co-produce, communicate, deliver and use climate services for decision-making in climate-sensitive socioeconomic sectors. NMHSs and other national institutions can use these guidelines in their entirety, adapt them to unique circumstances in their countries or use only the parts that they find useful.

Following this introductory chapter, Chapter 2 presents the background to climate services and GFCS, and also some details on an NFCS including lessons learned from global experiences in setting one up. Chapter 3 presents the five steps required to establish an NFCS, and Chapter 4 gives some conclusions. A strategic planning template for use by an NFCS is given in the appendix, and then the annexes provide other additional information. Key points are provided so that readers can see important points at a glance.

This document explains how to initiate and develop a functional NFCS that will serve as a key coordination mechanism to bring together the local, national, regional and global stakeholders needed for successful generation and delivery of co-designed and co-produced climate services with and for users, effectively linking climate knowledge with action on the ground at national and local levels.

It is envisaged that the outcome of the five steps discussed in Chapter 3 will be a cohesive and coordinated NFCS that ensures the widespread generation and use, at a large scale, of climate services to enhance the resilience of society and spur growth in the productive sectors of socioeconomic development that are sensitive to climate variability and change.

The development and delivery of climate services at the national level requires significant interaction among providers, researchers and users of climate services, including governments, civil society, communities, the private sector, technical partners and donors. These interactions must involve decision-makers, policymakers, local users, climate scientists and sector experts.

It is hoped that this publication will promote the strong partnerships at the national level that are needed for successful provision of climate services that inform climate-sensitive decision-making, and effectively contribute to sustainable development and resilience-building of communities and economies.

2. BACKGROUND

2.1 What are climate services?

The High-level Taskforce for GFCS defined climate services as “Climate information prepared and delivered to meet users’ needs” (WMO, 2011).

Climate services are also considered as a process of providing climate information in a way that assists decision-making by individuals and organizations.¹ The establishment of GFCS involved

Key point

It is important for readers to provide feedback on these guidelines to the GFCS Secretariat (gfcs@wmo.int) so that successes can be showcased and guidance based on common experiences improved.

¹ http://www.wmo.int/gfcs/what_are_climate_weather_services.

WMO working with other relevant United Nations organizations acting as one on climate knowledge.² This indicates co-production of climate products for various users.

2.1.1 ***Precept of co-production with users***

One core precept of GFCS is co-production of climate services with users. Co-production is intended to transform climate data into information and then into client-tailored climate services, including relevant forecast-based advisory services and decision-making tools that the client can make use of. This necessitates a process of partnership-building, iterative dialogue and feedback among providers and users of climate services. Effective interdisciplinary and cross-sectoral collaboration is also an important prerequisite for the transformation of climate data and information into climate services, blending climate knowledge with sector-specific knowledge. At its core, this approach postulates that climate information is not a climate service. To create a climate service – which, by definition, has to respond to a climate need – user engagement, iterative dialogue to understand and address client needs, and testing and refinement of the product based on client feedback, are compulsory.

Two examples of how climate information can be tailored into user-driven products are given in the following:

- (a) When an agricultural expert within a department of agriculture, or researcher at a national agricultural research institute, receives a rainfall forecast bulletin for the next 3 months (climate information), they will be able to overlay this piece of information with their knowledge base on the state of the growing season for farmers in a given region of the country, including stages of plant phenology and multiple other agricultural parameters (sector-specific knowledge), to produce a tailored rural advisory based on the received climate information – an “agromet advisory” (climate service).
- (b) Similarly, when a public health planner at a national department of health receives information on expected amounts of rainfall forecast and associated temperatures for the season (climate information), they will overlay this information with national health datasets on disease epidemiology per locality for that particular season (sector-specific knowledge). This will help to determine whether the season is likely to be prone to an epidemic breakout of a vector-borne disease (for example, malaria, meningitis, typhoid or Rift Valley fever) and produce a climate and “health advisory” (the climate service) for distribution through public communication channels.

The effective delivery of user-tailored climate services can only be realized through strong partnerships among NMHSs and user groups, including sectoral experts, government agencies, private sector and academia. This will help in the interpreting, tailoring, processing and applying of climate information and advisory services for decision-making, for sustainable development, and also for the improvement of climate information products, predictions and outlooks. The processing of received climate, weather and water forecast information to jointly produce, among providers and users, a relevant climate service is defined as co-production.

2.1.2 ***Guidelines for providing climate services***

The following are the three fundamental guidelines for providing climate services:

- (a) **Know the user and understand what is needed:** Understand the climatic elements that are relevant to the user; how the user wishes to receive information; how the user is likely to interpret the information; for what purpose the information will be used; the decision process of the user; and how the information might improve the decision-making processes.

² <http://www.unsystem.org/content/un-system-delivering-one-climate-change>.

- (b) **Make the information service simple, accessible and timely:** Provide products that can be understood and readily applied by the user, along with easy access to follow-up professional advice.
- (c) **Ensure quality:** Provide products that have been developed with skill and with an understanding of possible applications and analytical techniques, complete with proper documentation and backed by thorough knowledge of up-to-date data availability and characteristics.

2.1.3 ***Support to climate-smart decisions and their applications***

Effective climate services will facilitate climate-smart decisions that will enable better management of the risks and opportunities of climate variability and change in climate-sensitive productive sectors; for instance, in the food security, health and water resource management sectors.

Climate services involve a combination of:

- Accumulation of knowledge about the past, present and future state of the climate system
- Identification of the type and form of services involving information about the climate and its effects that are needed within the community at large and within specific productive sectors that are particularly sensitive to climate variability and change
- Development and delivery of advice, and provision of a range of advisory services and decision-support products based on climate knowledge, driven by identified needs
- Effective uptake and application of the advice and products to help achieve the desired outcomes

2.1.4 ***Examples of user-tailored climate services***

Climate services will be most beneficial when they are tailored to suit a particular purpose, for example:

- **Long-term policymaking:** This can be supported by climate change scenario projections.
- **Medium-term decision-making:** This can be supported through guidance provided by interannual climate variability projections.
- **Short-term decision-making:** This can be supported by weather and climate forecasts and warnings for up to seasonal timescales. Short-term decision-making is relevant to a wide diversity of community interests, including agriculture and food security, fisheries, livestock, water resource management, health planning, industry and commerce.

The process of developing user-tailored climate services will typically involve the translation of temporal and spatial information about the climate into decision-support tools to suit the needs of specific sector applications, with the means of carrying out the translation underpinned by applied climate research that has targeted each climate-sensitive sector.

Development and implementation of targeted climate services requires multidisciplinary and multi-institutional collaboration to assess the climate-related risks across the spectrum of activities within the targeted sectors. This will require the sharing of observations, data and expertise across the various sectors.

2.2 What is the Global Framework for Climate Services?

Heads of State and governments, ministers and heads of delegations, present at the World Climate Conference-3 (held in Geneva, 31 August–4 September 2009), established GFCS. It is a tool to strengthen the production, availability, delivery and application of science-based climate prediction and services. The world leaders recognized a growing need for these services to enable societies to address the challenges associated with extreme climate events and take advantage of the associated opportunities.

Acting as one on climate knowledge, WMO, together with United Nations and other international organizations and WMO Members, established GFCS. It was envisioned that improvements in climate services could only be realized if relevant institutions at global, regional and national levels work together to complement their efforts by sharing expertise and data in their respective areas of specializations and mandate to inform the development and delivery of high-quality user-oriented climate services. Box 1 demonstrates collective efforts on all elements needed for effective climate services.

Therefore, GFCS aims to enable society to better manage the risks and opportunities arising from climate variability and change, especially with a view to those who are most vulnerable to such risks, by developing and incorporating science-based climate information and prediction into planning, policy and practice.

Although the initial focus was on the four priority areas of water, health, agriculture and food security, and disaster risk reduction (DRR) (with energy added subsequently), all climate-sensitive sectors stand to benefit in the long term.

2.2.1 Goals of the Global Framework for Climate Services

There are five overarching goals of GFCS:

- (a) Reducing the vulnerability of society to climate-related hazards through better provision of climate information and services
- (b) Advancing the key global development goals through better provision of climate information and services
- (c) Mainstreaming the use of climate information and services in decision-making
- (d) Strengthening the engagement of providers and users of climate services
- (e) Maximizing the utility of existing climate service infrastructure

Box 1. Collaborative needs for effective climate services

Given the complexity of and requirements for climate services, addressing the immense variety of user needs for climate services is beyond the capacity of any single organization, small group of organizations or individual country. It calls for an unprecedented collaboration among institutions across political, functional and disciplinary boundaries. Therefore, GFCS was conceived as an integrating set of international arrangements that will be built upon established global climate observation and research programmes and operational structures, to become an end-to-end product generation, service provision and application system. Many of these elements (systems, programmes, projects, institutions, etc.) are either in place or are in the process of being established. GFCS must be designed to be an effective, efficient and economically viable mechanism for the generation, delivery and application of climate services.

Source: WMO (2010a)

Effective development and use of climate services will be of great value for decision-making in many economic and social sectors. The value of using climate services needs to be properly assessed, by either providers or users in various application areas and geographic locations.

2.2.2 **Guiding principles of the Global Framework for Climate Services**

There are eight principles for guiding the successful achievement of GFCS goals:

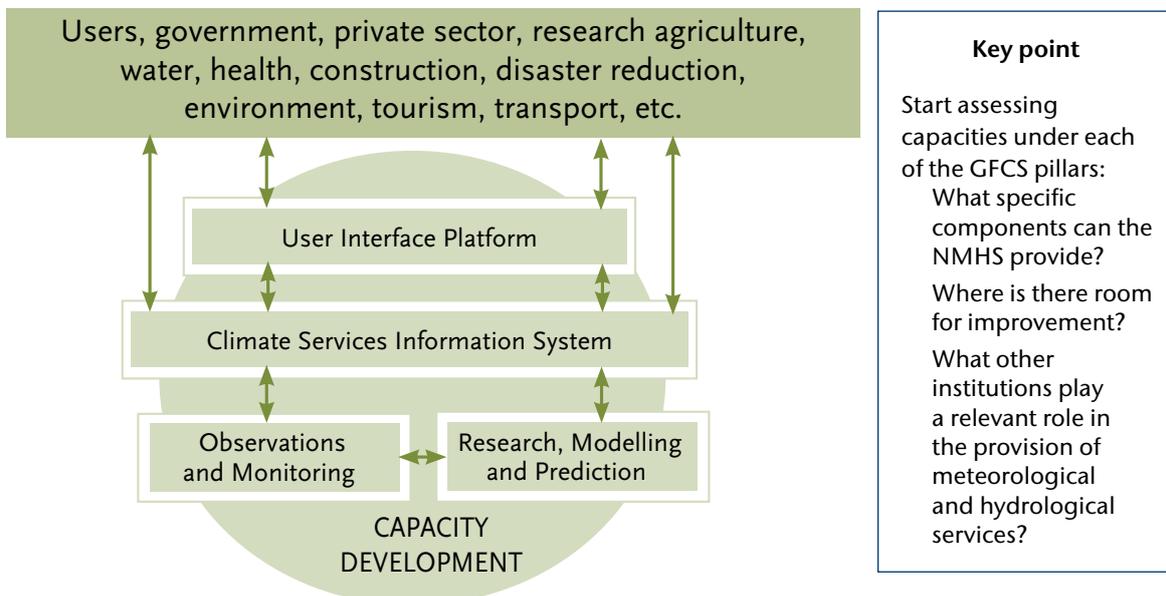
- (a) All countries will benefit, but priority shall go to building the capacity of developing countries vulnerable to the impacts of climate change and variability
- (b) The primary goal will be to ensure greater availability of, access to and use of enhanced climate services for all countries
- (c) Activities will address three geographic domains: global, regional and national
- (d) Operational climate services will be the core element
- (e) Climate information is primarily an international public good provided by governments, which will have a central role in its management
- (f) Promote the free and open exchange of climate-relevant data, tools and scientifically based methods while respecting national and international policies
- (g) The role of GFCS will be to facilitate and strengthen, not to duplicate
- (h) GFCS will be built through user-provider partnerships that include all stakeholders

Key point

Find out more about GFCS in general, and about its implementation plan in particular, at: www.wmo.int/gfcs/.

2.2.3 **Role of the Global Framework for Climate Services and its component pillars**

The role of GFCS is to coordinate, facilitate and strengthen collaboration among institutions to avoid duplication of efforts. It is built through user-provider partnerships that include all stakeholders, and is based upon the following five components, or pillars (see Figure 1):



Key point

Start assessing capacities under each of the GFCS pillars:
 What specific components can the NMHS provide?
 Where is there room for improvement?
 What other institutions play a relevant role in the provision of meteorological and hydrological services?

Figure 1. Functional components (pillars) of GFCS

- **User interface platform (UIP):** A structured means for users, climate researchers and climate information providers to interact at all levels
- **Climate services information system:** The mechanism through which information about climate (past, present and future) is routinely collected, stored and processed to generate products and services that inform often complex decision-making across a wide range of climate-sensitive activities and enterprises
- **Observations and monitoring:** To ensure that climate observations and other data necessary to meet the needs of end users are collected, managed and disseminated and are supported by relevant metadata
- **Research, modelling and prediction:** To foster research towards continually improving the scientific quality of climate information, providing an evidence base for the impacts of climate change and variability and for the cost-effectiveness of using climate information
- **Capacity development:** To address the particular capacity development requirements identified in the other pillars and, more broadly, the basic requirements for enabling any GFCS-related activities to occur

2.2.4 ***Implementing the Global Framework for Climate Services pillars at the national level***

The critical component of GFCS is the UIP. The involvement of users in helping to establish the needs, co-develop appropriate products, identify capacity development requirements and influence the direction of observational investments and research efforts is crucial in achieving GFCS goals. The UIP therefore influences the development of all the other pillars of GFCS. The present guidelines help to establish a successful UIP.

The annex to the GFCS implementation plan (WMO, 2014), concerned with the description of the UIP, identifies a set of activities that need to be in place, namely:

(a) Feedback:

- (i) Establish, in each priority area at the national level, a systematic process to gather and analyse the requirements for climate information;
- (ii) Undertake surveys of user-focused networks, collaborations, partnerships, forums, centres and learning exchanges relevant to each of the priority areas.

Key point

Think about the national context:
Which of these interfacing activities are currently being carried out in the country?
By whom?
Are they successful?

(b) Dialogue:

- (i) Interact with other pillars of GFCS to articulate user needs and perspectives as required;
- (ii) Build a suitable means (website, social media cloud facility, etc.) for the UIP to gather, analyse and disseminate user needs for climate information and applications.

(c) Outreach:

- (i) Formulate key messages about GFCS in consultation with representatives of user organizations and the other GFCS components;
- (ii) Contribute guidance and support to facilitate user engagement in the projects undertaken for capacity-building. Support other actors, particularly in developing countries, to undertake these tasks at regional and national levels.

- (d) Monitoring and evaluation (M&E):
- (i) Organize, in each priority area, a specific assessment of the most promising opportunities for introducing new or improved climate services to existing collaborative mechanisms;
 - (ii) Coordinate the monitoring of user perspectives and feedback on the functioning of GFCS, and provide user-oriented support to the other GFCS pillars.

Effective collaboration with global, regional and national stakeholders is supported and promoted by GFCS, which is a global partnership among governments, United Nations organizations and international agencies that produce and use climate information and services. It is an initiative led by the United Nations, where the United Nations organizations deliver as one on climate knowledge. WMO leads GFCS in collaboration with the Food and Agriculture Organization of the United Nations, the United Nations Development Programme, the United Nations Educational, Scientific and Cultural Organization, the United Nations Office for Disaster Risk Reduction, the World Food Programme, the World Health Organization and others, to guide the development and application of science-based climate information and services in support of decision-making in climate-sensitive sectors. These international partners are pooling their expertise and resources to design and produce knowledge, information and services that support effective decision-making.

At the regional level, GFCS seeks to identify user needs (through regional consultations for climate services), bring the providers and users of climate services together, develop capacity for generating and using climate services, and build operational climate services that can assist decision-makers to reduce vulnerability and adapt to climate impacts in the priority areas of agriculture and food security, water, energy, health and DRR. Equally important is the enhancement and development of Regional Climate Centres to support national institutions with the required technical capabilities to develop effective climate services.

Key to the implementation of GFCS is the establishment of a framework for climate services at the national level. Such a national framework will enable the appropriate coordination and collaboration mechanisms required to ensure that the GFCS pillars are effectively addressed at the national level through identification of gaps, needs and priorities in the various GFCS components, to support the development and application of climate services.

The development and implementation of targeted climate services will generally require multidisciplinary and multi-institutional collaboration to assess the climate-related risks across the spectrum of activities within the targeted sector.

Box 2 provides some basic definitions used within GFCS.

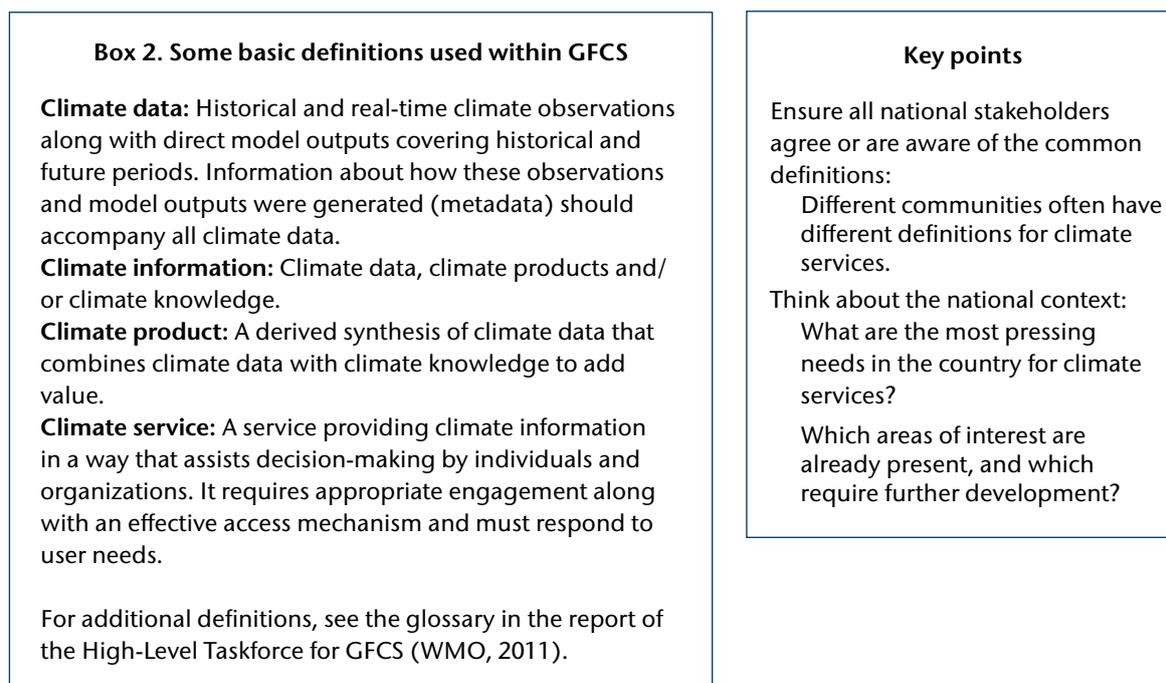
All countries are facing difficulties in coping with the increasing effects of hydrometeorological hazards and resulting disasters, whether through a growth in the number of severe events, increased exposure, heightened vulnerability, limited capacities or a combination of all factors. Financial and technical efforts have to be directed towards strengthening capacities at national and local levels, drawing on international support where necessary. See Annex 1 for a description of the requirements to fulfil different levels of capacities to deliver climate services, and the role of an NMHS in delivering an NFCS. Critical steps will need to be taken to create enabling mechanisms that support development decisions with respect to mitigation, as well as building resilience of countries to cope with future climate risks.

The socioeconomic consequences of hydrometeorological hazards are often most severely felt at the local level; consequently, climate risk management requires that decision-making be based on climate information that can be “downscaled” to a local context.

Key point

Think about assessing services in terms of cost–benefit analyses:

International studies have found that this helps in convincing ministries of finance to support operational services.



2.3 What is a National Framework for Climate Services?

An NFCS is an institutional mechanism to coordinate, facilitate and strengthen collaboration among national institutions to improve the co-production, tailoring, delivery and use of science-based climate predictions and services by focusing on the five GFCS pillars.

A sample institutional arrangement for an NFCS is displayed in Figure 2.

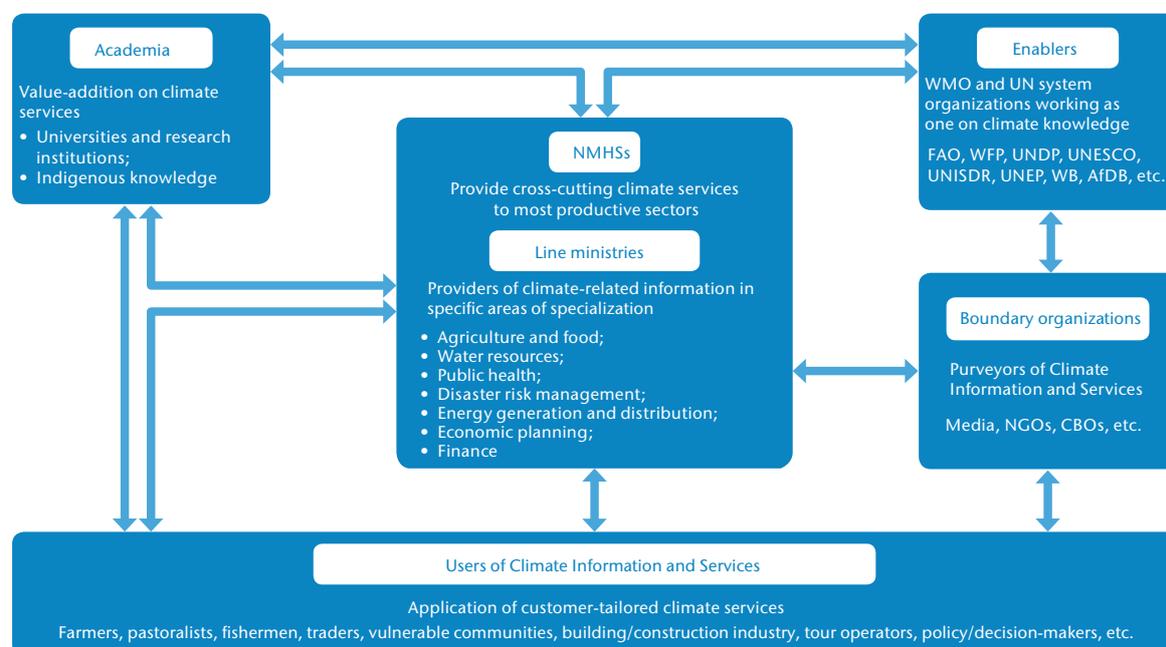


Figure 2. Schematic representation of an NFCS showing interlinkages among partner institutions acting together as one on climate knowledge (AfDB = African Development Bank; CBO = community-based organization; FAO = Food and Agriculture Organization of the United Nations; NGO = non-governmental organization; UN = United Nations; UNDP = United Nations Development Programme; UNEP = United Nations Environment Programme; UNESCO = United Nations Educational, Scientific and Cultural Organization; UNISDR = United Nations International Strategy for Disaster Reduction; WB = World Bank; WFP = World Food Programme)

In each country, it is envisaged that the NFCS should be initiated and led by the country's NMHS, which is usually the government-mandated provider of weather, water and climate services (Box 3). All relevant national stakeholders from the five GFCS component pillars should be engaged by NMHSs, to enable improvements and sustainable delivery of climate services. This could be done through permanent and sustained dialogue to identify needs and priorities for developing climate information and products tailored to the decision-making needs and contexts of different users in the country.

Box 4 gives an example of a GFCS programme in Africa.

As part of a baseline assessment (step 1 of the NFCS process described in Chapter 3), NMHSs should take stock of national institutions providing climate-related information and major ongoing climate-related programmes and activities in the country. They should also use the list of stakeholders established through the baseline assessment to convene a national stakeholder consultation workshop, and lead a consultation process to establish an NFCS. As part of the NFCS configuration, the governance structure and the process to operationalize the NFCS are among the decisions that should be made at the national level during the stakeholder consultation workshop.

In the process of establishing the NFCS, NMHSs are also encouraged to involve key national ministries/departments (including the ministries responsible for finance and planning), development partners, United Nations organizations and all of their partners operating in the country (Box 5).

Box 3. Role of NMHSs in NFCSs

The role of WMO in NFCSs is built upon the enhanced capacities of NMHSs, which have, for decades, provided climate services in the form of historical climate data and related products for taking long-term planning decisions. In so doing, WMO will rely on: the infrastructure and human resources of NMHSs; its strong association with long-term partners in climate activities and establishing new partnerships required for sustainable operations and uptake of climate services at global, regional and national levels; an effective interface among scientists, service providers and decision-makers; and coordinated actions with other partners in the United Nations and boundary organizations.

Source: WMO (2010a)

Box 4. Africa Adaptation programme

The GFCS Africa Adaptation programme provides an example of a GFCS partnership in action "delivering as one" on climate services in Africa. Since 2014, in Malawi and the United Republic of Tanzania, the World Food Programme, the World Health Organization, the International Federation of Red Cross and Red Crescent Societies and two research institutions (CGIAR Research Programme on Climate Change, Agriculture and Food Security and Chr. Michelsen Institute), working together with WMO, have been supporting the Tanzanian Meteorological Agency and Malawi's Department of Climate Change and Meteorological Services to work with partners across the ministries responsible for agriculture, livestock, fisheries, health and planning. This has enabled co-development and communication of improved climate services that will add value to the lives of communities vulnerable to climate-related risks. Further information about the GFCS Africa Adaptation programme is available at: http://www.wmo.int/gfcs/Norway_2.

Box 5. Role of the United Nations

For successful mobilization of United Nations agencies and other technical and development partners, NMHSs are encouraged to liaise with the United Nations Country Coordinator's Office to request designation of a United Nations focal point to work closely with them and the NFCS to support efforts to mobilize resources.

2.3.1 **Lessons learned from initial implementation projects**

Since July 2012, GFCS has started piloting the establishment of Frameworks for Climate Services in Belize, Benin, Burkina Faso, Cameroon, Chad, Côte d'Ivoire, Madagascar, Malawi, Mali, Niger, Senegal, South Africa, United Republic of Tanzania and Vanuatu. Many other countries are also embarking on the process in order to build UIPs where such mechanisms are most critically needed: at the national level.

Key point

The National Frameworks that exist and are operational around the world are given at: www.wmo.int/gfcs/.

Conceived as national declinations of GFCS, NFCSs were proposed and introduced to serve as national mechanisms to bridge the gap between the climate information being developed by scientists and service providers on the one hand, and the practical needs of users on the other hand. However, for such a framework to be obtained at the national level, national stakeholders have to drive the process and design it in a manner that addresses national needs and priorities for climate service provision and utilization.

Box 6 illustrates the 10 prerequisites identified based on pilot experiences in Africa as the essential starting points for successful development of an NFCS.

2.3.2 **Functions of a National Framework for Climate Services**

The main functions of an NFCS are to serve as:

- **A platform for institutional coordination, collaboration and co-production** among relevant technical departments across line ministries at national and subnational levels

Box 6. Ten prerequisites for successful development of an NFCS, identified from pilot experiences in Africa

1. Build a strong and enhanced NMHS anchorage for the NFCS; national ownership, leadership and commitment by a designated competent national authority are crucial for success
2. Meet the demand for tailored climate service provision in the priority climate-sensitive sectors in the country (agriculture and food security, health, disaster risk management, energy, infrastructure/transport, tourism, etc.)
3. Build the capacity of NMHSs and other national technical services to jointly elaborate salient climate products and services with their users from each sector, building on existing pluri-disciplinary knowledge and expertise from each sector
4. Improve the widespread communication of climate services
5. Diversify communication channels, through utilization of innovative and suitable channels for broadcasting (aside from television and radio)
6. Modernize and increase the density of the national hydrometeorological observing network, to improve the capacity to meet growing end-user needs
7. Improve collaborative climate research, towards climate research outputs that are more salient and end-user driven
8. Develop and strengthen the capacity of end users to further access and effectively apply climate services
9. Sustain the newly defined Framework for Climate Services at the national level
10. Engage all national stakeholders involved in the production, tailoring, communication and utilization of climate services in a national dialogue around climate service provision, to identify country needs and chart a course for the provision of user-tailored climate services at the national and subnational levels

Key point

An assessment of the key prerequisites can help to inform the WMO Country Profile Database: Regular updates of this database will help to showcase national improvement on a global scale.

(NMHSs, and technical experts across line ministries of water, agriculture, health, energy, DRR, etc.), to develop and deliver user-oriented climate services. Often, sectoral subcommittees or working groups are established as part of the NFCS to facilitate in-depth and regular interaction among NMHSs and their sectoral counterparts (climate and health working groups, interdisciplinary working groups on climate and agriculture, climate and energy subcommittees, DRR platforms, etc.).

- **A legal framework** for collaboration at the national level to generate and share user-oriented climate services for use by the relevant social and economic sectors.
- **An opportunity to bridge the gap** between available climate services and user needs at national, subnational and local levels, continuously identifying user needs for climate services, communicating available climate products and services to users in the relevant sectors, and obtaining feedback from users on climate products and services.
- **A vehicle for scientific coordination** to synthesize the state of the climate at the national level, and distil climate knowledge outputs for policymaker actions founded on scientific evidence.
- **An operational bridge** between climate research, NMHSs and other relevant national institutions, to increase collaboration to improve services by working together on climate knowledge, and by sharing data and expertise.
- **A functional chain for linking climate knowledge with action** on the ground so as to maximize the application of climate information and products by identifying bottlenecks in improved delivery of climate services.
- **An opportunity** for enhancing the contribution of climate science to the development of national adaptation plans, DRR, Sustainable Development Goals and national development policies by enhancing the integration of climate information and products into decision-making as well as into national policies.

2.3.3 **National Framework for Climate Services Interministerial Steering Committee**

Each NFCS generally has a steering committee at the interministerial level. Additional guidance on the functions of the steering committee is provided in a WMO Position Paper (WMO, 2010b). Countries are encouraged to develop governance structures most suitable to their national circumstances and requirements. The most common governance structure is given in Figure 3.



Figure 3. Operationalizing an NFCS: sample institutional flow chart
(AG = agriculture; WG = Working Group)

3. ESTABLISHING A NATIONAL FRAMEWORK FOR CLIMATE SERVICES

Figure 4 gives a schematic representation of the five steps for establishing an NFCS.

3.1 Step 1: Assessing the baseline on climate services

The first step in establishing an NFCS is to assess existing capacities and have a baseline. This can be achieved by answering the following questions:

- (a) What are the capacities of the relevant institutions in a country with regard to the five GFCS pillars?
- (b) What is the country's state of readiness to implement an NFCS?
- (c) Which actors make up the national chain for climate services, that is, who are the key stakeholders in the chain linking climate knowledge with action on the ground (users/providers/co-producers/communicators/boundary organizations/enablers/partners)?
- (d) What climate services are currently being provided? What are the needs? And what gaps exist in climate service delivery?

Assessing the level of capacity of all the stakeholders covering the full climate services cycle from development to use at national and local levels – for example, the climate service providers in the country including the NMHS, users and boundary organizations – will help identify the critical gaps that exist to co-produce, deliver, communicate, use and evaluate salient climate services and determine opportunities for improvement.

The questionnaire provided in Annex 1 below is designed to assist countries to conduct a baseline assessment to establish institutions providing climate-related information, the current status and any existing collaboration mechanisms. This analysis will enable NMHSs to identify the stakeholders to be invited to attend national consultation workshops on climate services.

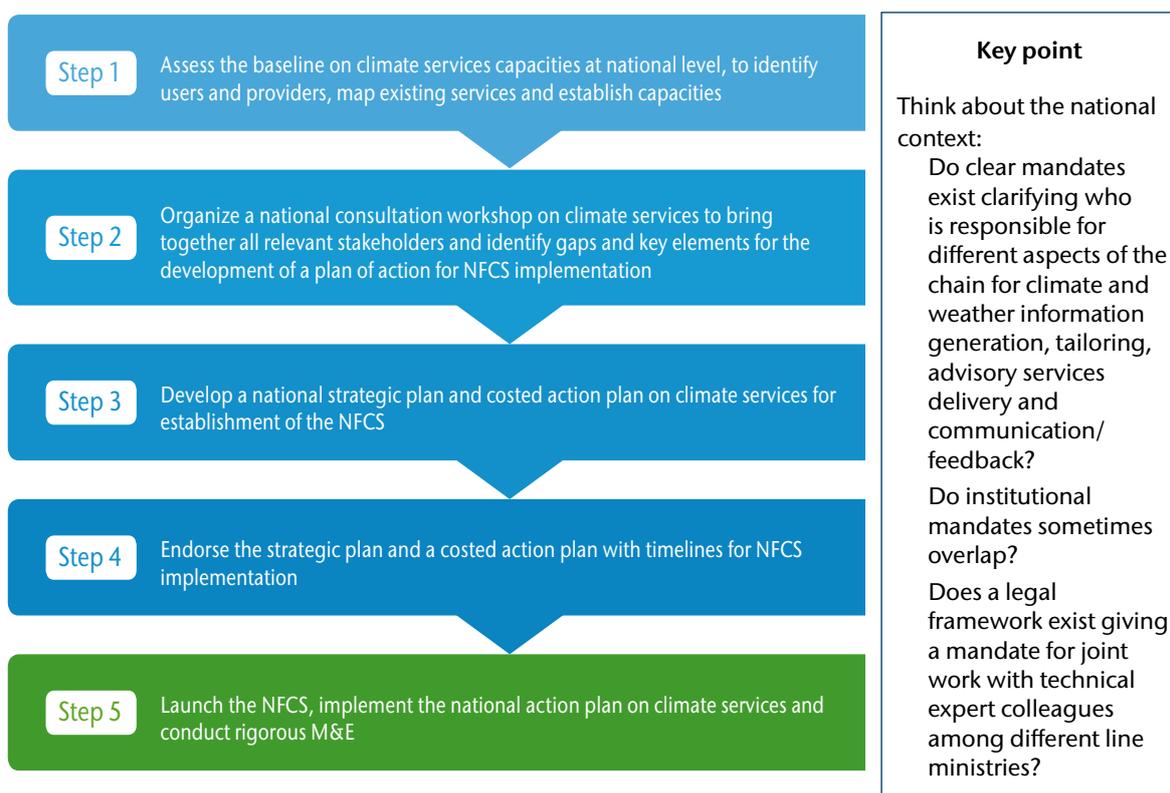


Figure 4. Five steps for establishing an NFCS

The assessment should include: the status of climate services provided by the NMHS; technical partners in co-production; and indigenous knowledge from local communities, academia and experts from climate-dependent sectors such as agriculture, civil protection agencies, health, water resource management, energy, transport, architecture, civil engineering, infrastructure, military, building/construction industry and police.

Other stakeholders to engage in such exercises are professional communicators, extension agents, research institutions, provincial- and district-level planners, community-based organizations and church-based organizations, who all play a role in the national chain for climate services.

3.1.1 **Key stakeholders in climate services**

The key stakeholders in climate services include: users, providers, co-producers, communicators, boundary organizations, enablers and partners. The stakeholders should come from all GFCS priority areas and pillars, but should also include other interested stakeholders. They are interconnected partners with complementary roles, and make up the national chain of climate services for linking climate knowledge to adaptation action on the ground. By working together, they are able to turn climate information into climate services with societal value. Figure 5 displays a schematic diagram of the value chain for climate services at the national level.

At the centre of the value chain mapping process is the belief that different stakeholders and communities of practice operating at the national level have a tremendous amount of knowledge to learn from each other and to contribute to each other. This will advance their shared interests of reducing adverse impacts of climate-related risks while maximizing the socioeconomic benefits gained by receiving advance information of weather, water and climate parameters. Mapping and critically scrutinizing the stakeholders that should be involved at the national and local levels is essential for successful implementation of an NFCS.

All stakeholders with a role in the climate services value chain, from production, co-development through to use at the local level, should be involved. This often includes NMHSs and Regional

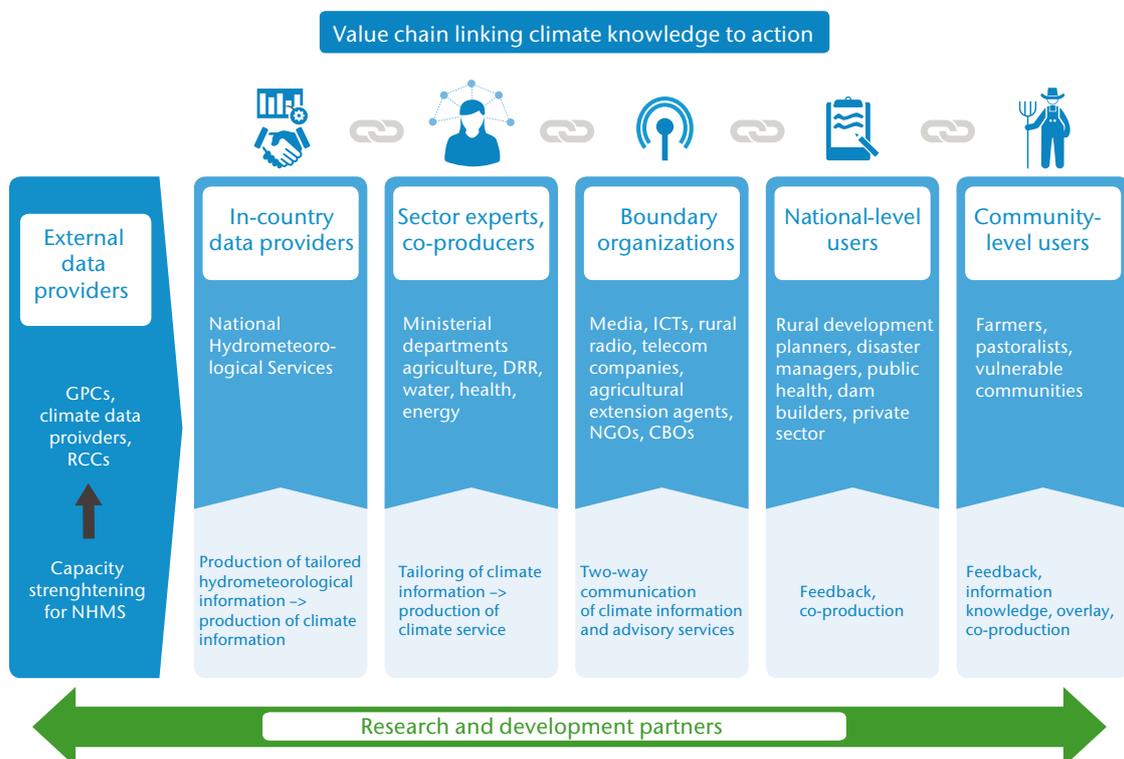


Figure 5. National value chain for climate services (CBO = community-based organization; GPC = global producing centre; ICT = information and communications technology; NGO = non-governmental organization; RCC = Regional Climate Centre)

Climate Centres, as well as climate-dependent sectors such as agriculture and food security, fisheries, civil protection, aviation, marine, health, water resource management, tourism, energy, transport, infrastructure/building and construction, and local and central governments.

The sector-specific knowledge of vulnerability and exposure of these partners helps to tailor weather, climate and hydrological forecasts received from NMHSs, in order to transform information (for example, forecast of a heavy rain event) into a service (translation of what a heavy rain event will mean, given the local context and advice on preventive measures to adopt).

All of these national stakeholders, interlinked in mandates that complement each other's work, form the national chain for climate services.

Key points

Include media, communicators and social media correspondents, such as bloggers, Facebook groups and community leaders:

Remember the municipalities and private sector who might have a stake in climate services (for example, the local utilities company or the dam manager).

Think about the national context: Is there any connection to the national media?

Is it satisfactory?

If not, what is hampering relationships with the media?

In most countries, the main institutional actors in the climate science community are known to include:

- Forecasters at the NMHS and/or civil aviation agency (the main national institution mandated to issue weather and climate forecasts)
- Climate modellers and researchers at national universities (academia, NMHSs, research laboratories and other climate research hubs in the country)
- Scientists at other parastatal institutions such as centres for remote-sensing, resource surveys and ecological monitoring, as well as other national hubs for applied research on environmental hazards
- Hydrologists at the water resources management service, bureau or ministry (if they are not housed in the NMHS)
- Indigenous climate forecasters
- Others, according to country structures and specifications

The co-producers, or partners to NMHSs in the tailoring and curating of science-based forecasts to generate a user-relevant climate service, often include:

- Bioscientists working on climate-related disease outbreaks
- Agricultural researchers and agronomists working on crop development and production
- Animal breeding and health specialists in charge of the pastoral strategy for the country
- Marine and aquaculture scientists working on the effects of climate on fisheries and marine life
- Non-governmental organizations, farmers, pastoralists, fishermen and the public
- Economic planning, development and finance ministries
- City planners, architects and civil engineers
- Civil aviation authorities and civil defence authorities (military and police)

The main boundary organizations capable of serving as middle links among providers and users of climate services should not be forgotten. These may include:

- Prominent state media agencies, as well as private press organizations with a vested interest in communication of climate information and related advisory services
- National networks of journalists specialized in climate change communication (where these networks exist)
- State-mandated and private rural extension services
- Non-governmental organizations, Red Cross volunteers and community-based organizations active in climate change adaptation and resilience-building including associations for women and youths
- Rural radio networks
- Private sector telecommunication companies

The main user groups capable of using climate services, providing feedback on their utility/ improvability and realizing societal benefits include:

- Non-governmental organizations, community-based organizations, farmers, pastoralists, fishermen and the public
- Local governments and municipalities
- Government departments in charge of climate-sensitive sectoral planning (agriculture, water, energy, DRR, health, infrastructure, etc.)
- Economic planning, development and finance ministries
- City planners, architects and civil engineers
- Civil aviation authorities and civil defence authorities (military and police)
- The private sector

Finally, in mapping key stakeholders to engage among national-level stakeholders from the user community, a balance is needed between high-level decision-makers (directors of line ministry departments, ministry officials, etc.) and technical staff, to ensure both technical relevance and political ownership and support at the highest levels for the commitments that emanate from the national dialogue on climate services. Personal visits to invited partners by directors of NMHSs are encouraged, and explaining the background and incentive can help in ensuring buy-in from the start. All occasions of personal interactions at meetings, conferences or national convocations should be used to engage the technical and high-level officials of all stakeholders, and current and potential clients of the products of NMHSs.

Before holding an initial national consultation workshop, it is important to plan and dedicate sufficient time for these precious interactions. A brief description of the method to assess stakeholders is provided in the *WMO Integrated Strategic Planning Handbook* (WMO, 2016), [section 3.2.1.1.3](#). The questions that can help identify and map the stakeholders are provided in Annex 2 below.

3.1.2 ***Analysis of current user interface platforms, climate services and gaps***

Together with analysis of capacities and stakeholders comes analysis of the current status of climate services provided by the NMHS and other institutions in the country, and the level of

formalized interactions among providers and users of climate services.

There are countries where ministries, institutions, research centres and other public and private entities provide climate services using climate data and products provided by the NMHS and others. The UIP calls for a suitable means to gather, analyse and disseminate user needs for climate information and applications (WMO, 2014).

The following questions may be helpful to initiate discussions of the current status:

- (a) What are the best climate services provided to end users in the country?
- (b) Which institution in the country is the best to train end users on how to use the climate services provided?
- (c) Which climate services are the most useful to the end-user community?

Box 7 describes a practical example of a UIP functional in Mali, West Africa. Annex 3 below provides an additional example of an Indian UIP.

Key point

Note that the UIP can be a coordination mechanism such as the National Platform for Disaster Risk Reduction, an institutionalized structure such as a national climate change committee, regional/national climate outlook forums, or an interactive website or social media platform providing space for sharing of information, advisories and feedback.

Box 7. Example of a UIP – the Interdisciplinary Working Group (Groupe de Travail Pluridisciplinaire) in Mali

In 1982, in response to the 1974 drought that wreaked havoc through the Sahel, the National Meteorological Directorate in Mali launched a project to provide climate information to rural communities, especially the farming community. Thus, the *Projet d'Assistance Agro-meteorologique au Monde Rural* was born. The aim was to provide weather and climate information that would help farmers make decisions about their crops, ultimately giving them long-term food security. The project was highly innovative from the outset. It was the first example of an NMHS in Africa supplying weather and climate-related advice and recommendations directly to local communities, with an ambition to scale out to the national level (Diarra and Stigter, 2008).

The goal of the project was to identify how rural farmers could use weather and climate information to make informed decisions in their farming activities, to alleviate the impacts of drought. The project also sought to directly involve rural communities in agrometeorological activities with extension workers, agricultural officials and policymakers. During the project, local farmers were supplied with raingauges to measure rainfall in their fields, and were trained in how to collect data and then use those data to inform their agricultural decisions. This project is significant because several public services and institutions were involved. The project activities were organized by a multidisciplinary working group called the *Groupe de Travail Pluridisciplinaire (GTP)*. The group met every 10 days and included people with technical, development and research backgrounds, including members of the NMHS, the Ministry of Agriculture, research institutes, rural development agencies, farmers and the media. Therefore, GTP was the centre of two-way information flow among climate service providers and users. The national GTP was replicated with multidisciplinary working groups at a local level (Tall et al., 2012).

The groups that participated in the Mali project had different, but well-integrated roles. The users defined the weather and climate-related data and products they needed. Farmers collected local rainfall data and then sent that information to the multidisciplinary working group. The Meteorological Service analysed the data. The extension services, research groups and Ministry of Agriculture worked on issues related to food production, crop health/protection and choice of crop varieties. The rural development agencies focused on capacity-building and information. And finally, the media disseminated the agrometeorological information.

Source: Tall et al. (2014)

3.2 **Step 2: Organizing a national stakeholder consultation workshop on climate services**

The second step in establishing an NFCS is to organize a national stakeholder consultation workshop on climate services. This should bring together all identified key stakeholders to draw consensus on the urgent need for improved climate services in the country and to identify the gaps and key elements for development of a national strategic plan and costed action plan for implementation of the NFCS, focusing on areas for joint action.

The main aim of the workshop is to involve experts from the NMHS and relevant regional/global climate centres in the country, government departments, universities and research institutions, key decision-makers, partners and practitioners from the initial GFCS priority areas. The workshop should facilitate identification of appropriate mechanisms to improve and sustain the flow, co-production and delivery of user-salient climate information for different users. Specifically, it should result in:

- Enhanced understanding of the needs for climate services in different user sectors
- Improved knowledge of the existing interface and communication mechanisms and recommendations for improvements where needed
- Clear understanding of capacity development needs to implement GFCS at the national level
- Strategic guidance on the institutional arrangements, partnerships and processes required to operationalize the NFCS at the national level

One of the main objectives of the workshop is to identify the complementary functions of diverse stakeholders in the national value chain for climate services (Figure 5). The leadership and roles of each institution involved in the NFCS should be agreed upon, with the aim of bridging the gap between climate information being developed by scientists and service providers, and the practical needs of users. One key prerequisite is therefore a national dialogue around the priority needs of the country in climate services to support effective climate risk management and adaptation. However, such a dialogue needs to be mediated.

The baseline information gathered in step 1 should be used in selecting the participants for the workshop. In addition, careful selection of participants is key to the success of the workshop. The rich mix of selected participants (both on the end-user side and on the climate expert side) brings to the national workshop a range of different experiences and expertise, and provides dynamic dialogue.

3.2.1 **Objectives of the national consultation workshop**

Specific objectives of the workshop are to:

- Bring together all the relevant stakeholders with a role in the national chain for climate services, and create realization and draw consensus on the urgency that they work together to improve the design, co-production, delivery and use of user-relevant climate services
- Review and share experiences on the status of climate services in the country and assess specific needs for climate services in the different climate-sensitive sectors
- Review the current status of interfacing mechanisms and interactions among climate services providers and users, identify major areas for improvement, and recommend effective mechanisms and practices
- Articulate the capacity-building needs in terms of mandates, infrastructure and human resources, in all GFCS components

- Establish the NFCS
- Agree on the roles and responsibilities of institutions involved in the NFCS
- Discuss and recommend arrangements for improved production, better access and sustainable operations for climate predictions and services to facilitate the flow of climate information from global and regional scales through to national and local scales
- Discuss and agree on key elements and next steps for developing a strategic plan and action plan to operationalize the NFCS
- Agree on the configuration and governance structure for the NFCS; it should be one that brings together all relevant national actors to work in a fruitful manner for improvement of climate services delivery at the national scale

Key point

Try answering the following question:
What structural obstacles prevent institutions from interacting with each other to provide salient climate services to those most in need of such services?

3.2.2 ***Running the national consultation workshop***

The workshop should be run in a participatory fashion, to break down the institutional and often historical barriers separating the communities of practice, which have to work together to link climate knowledge with action on the ground. Often, these different communities are not used to working together. For example, forecasters at NMHSs might never have worked with health practitioners and planners at the Ministry of Health. However, these forecasters and health planners must break down epistemological barriers, in order to collaborate in co-designing climate products oriented to avert and better plan for climate-sensitive disease outbreaks such as malaria, meningitis or cholera.

As such, a series of participatory processes, for example games and small group activities, can be utilized, if needed, to first “break the ice” between the two communities (providers, users, partners in co-production, communicators and boundary organizations), before each community learns what the others work on and are capable of bringing to their work. This may build appropriate desire for the communities to work together.

Owing to the nature of the initial consultation workshop, a retreat-style format is best, whereby all participants are invited to a location where they can spend 2–3 days focusing on articulating a new vision for climate services in the country, including how they will work together. A sample programme for running national consultations is given in Annex 4 below.

3.3 **Step 3: Developing a national strategic plan and action plan for the National Framework for Climate Services**

Based on the results of the national consultation workshop, the third step in establishing an NFCS consists of developing a national strategic plan with an annexed action plan detailing costs and timelines for delivering an NFCS and improving climate services delivery nationwide.

A strategic and action planning template for an NFCS should be used alongside the guidelines in this publication, in order to help develop a national strategic plan and action plan for establishment of the NFCS. A sample template is provided in the appendix below.

Key point

After the national consultation workshop ends, and to appropriately fill out and discuss the content of the emerging national strategic plan and action plan, avenues for continued interaction among participants of the NFCS should be created and given focus. These should be in the planning phase and in the implementation of activities that lead to enhanced delivery, use and application of climate services.

The national strategic plan and action plan for the establishment of an NFCS should capture and build on the decisions and recommendations of the national consultation workshop. Every effort should be made to ensure that the institutions that participated in the workshop are engaged throughout the processes of developing the strategic plan and its annexed action plan for the NFCS. This can be realized by putting in place a process for structured interaction among participating institutions immediately after the national consultation workshop, in order to ensure their full ownership and input to the development and validation of the document.

Key point

Check if there are sufficient staff and capacities to carry out the planning phase:
 If not, plan early to make provisions for extra staff.
 Ask the WMO GFCS Secretariat for appropriate help.
 Often, a request for support to hire a national consultant has proved helpful to support redaction of the national strategic plan and action plan for climate services.

This in-depth and user-targeted interaction with key stakeholders of the diverse priority areas and communities of practice will allow further refinement of the national strategic plan and action plan on climate services, to ensure the needs and aspirations expressed by all national institutions are articulated. This targeted interaction will ensure that appropriate actions are taken to realize the shared vision of the NFCS.

It is important to highlight that developing a national strategic plan and action plan on climate services is a process of gap-building that captures consensus among key national stakeholders on the needed steps and actions to improve climate service use at the national scale and how to realize such improvements. Most importantly, the plan should outline a common vision of how to jointly deliver and use climate services. The planning process should involve all stakeholders with a role in the national chain linking climate knowledge to action on the ground. Each institution should be properly vetted and engaged to ensure that its roles and areas of common interest for joint actions are captured in the strategic plan and action plan. The national strategic plan and action plan for implementing the NFCS also present the strategic direction for improving climate services and time-bound priority activities to be implemented to realize it.

Key points

Regular feedback through M&E processes is necessary to ensure successful and sustainable implementation of the NFCS. It is necessary to involve development partners throughout the entire process of development and endorsement of the costed national action plan, so that they are not served with a finished product after the endorsement workshop. Rather, they become partners in identifying the key priorities for investment in climate services in a country, and stand to support resource mobilization efforts once the plan has been finalized.
 The endorsed national action plans in GFCS pilot countries are available at: <http://www.gfcs-climate.org/national-action-plans>.
 Further information on the national workshops already conducted is available at: http://www.wmo.int/gfcs/national_workshops.

Often, when the capacities of the NMHS are not sufficient, a national consultant can be used to support the redaction of the national strategic plan and action plan for climate services.

The risks that may influence efforts to improve climate services should be included. An M&E process and reporting should be included as part of the plan to provide feedback on performance progress.

3.4 **Step 4: Endorsing the national strategic plan and action plan for the National Framework for Climate Services**

The fourth step in establishing an NFCS is to convene a high-level meeting with all national stakeholders (governments, United Nations agencies, development partners, donors, etc.) to endorse the national strategic plan and action plan developed.

3.4.1 ***Pre-validation and final validation workshops***

This endorsement step may include a technical pre-validation of the national strategic plan and action plan by the NMHS and its partners in co-production across sectoral technical departments in the country. Representatives from end-user groups and other relevant representatives of the NFCS being developed (sector representatives, partner United Nations organizations supporting the initiative, etc.) may also be included. This will ensure inclusion of perspectives into the plan, comprehensiveness and validation of the priority activities presented in the action plan to realize the implementation of the NFCS, as per the strategic direction outlined in the plan.

Following this intermediate step, a final political validation of the national strategic plan and action plan for establishment of the NFCS takes place. This event should put the NFCS under a national spotlight, by informing the general public of the initiative to improve the salience and widespread communication of new user-tailored climate services, based on a partnership among the NMHS and national/local sectoral departments. This highly publicized endorsement event should be presided over by the highest political authorities of the country (government officials, parliamentarians and dignitaries), and be ideally co-organized by the minister in charge of meteorology and climate change and counterparts from ministries responsible for climate-sensitive sectors in the country, with the involvement of planning and finance ministries.

An example of how the NFCS of Cameroon was arrived at and endorsed following a year of consultation among key national institutions is illustrated in Annex 5 below.

Annex 6 gives examples of governance structures adopted so far for NFCSs in Niger, Senegal, Côte d'Ivoire and South Africa.

Annex 7 provides a sample template for a national decree to establish a National Framework.

3.4.2 ***Resource mobilization to support activities of the National Framework for Climate Services***

Where national resources are insufficient to fund implementation of the NFCS, after the endorsement of national plans, an important part of the process is to develop project proposals to mobilize additional funds for implementation of the identified priority activities in the NFCS.

It is therefore recommended to organize a partner forum or donor round-table discussion at the sidelines of the endorsement workshop in order to introduce the national strategic plan and action plan to development partners operating in the country. This could explain the funding gap, enlist support to secure funding for implementing identified priority activities and agree on steps for implementation. Securing funds is a process that is resource intensive. It requires the development of different types of proposals, depending on the funding source (for example, the Green Climate Fund or the Adaptation Fund).

Box 8. Example of the Sahel proposal to the Green Climate Fund

Following high-level endorsement of their national action plans for climate services, seven countries in the Sahel (Burkina Faso, Cameroon, Chad, Côte d'Ivoire, Mali, Niger and Senegal) pooled together to develop a regional programme proposal to the Green Climate Fund. The proposal aimed to secure adequate resources for the implementation of the NFCS recently validated in each country, and implement priority activities identified in their national action plans to step up the delivery and use of climate services at the national scale. In the absence of adequate national resources, this proposal to the Green Climate Fund was essential to ensure operationalization of the NFCS in each country. Each country striving to secure resources for implementation of their NFCS should explore developing proposals, targeting similar global climate finance funds.

Further information on the Sahel regional programme proposal to the Green Climate Fund can be found at: <http://www.gfcs-climate.org/crafting-a-proposal-from-the-bottom-up-senegal>.

Mobilizing funds (from governments and development partners) to implement the NFCS will enable its launch and operationalization without any delays, while the other necessary processes to implement it are being considered by the government. Box 8 describes an example of a resource mobilization effort to secure resources for NFCS implementation in the Sahel region.

3.5 **Step 5: Launching a National Framework for Climate Services**

Finally, once a national strategic plan and a costed action plan, together with a decree creating the NFCS and governance structure, are agreed upon, it is time for the ministry responsible for meteorological services to convene an event to launch the NFCS. This should involve all relevant ministries, United Nations organizations and development partners.

The launch of an NFCS should not stall implementation of some of the high-priority activities agreed upon by the stakeholders. This has been the case in some countries, where the launch was held after the start of some activities. The event can occur at any time (preferably before the start of activities), as long as the operational beginning of interdepartmental coordination for the co-production, delivery and use of climate services in the country is initiated. This is the most significant benefit of establishing an NFCS.

Key points

Review the national strategic plan on a regular basis, for example after 2 years, and evaluate progress on at least an annual basis.

Plan for another “kick-off” type meeting after 2 years and compare the responsiveness of the communities at that point in time.

While additional financial resources are being mobilized among development partners or global climate finance funds, by the government and stakeholders within the NFCS, the country can begin implementation of priority activities for climate services using existing budgetary resources of the participating institutions and projects under way. Joint funding mechanisms should be considered for making maximum use of the existing national capacities and resources. This can include deployment or secondment of staff from countries where NMHSs have more experience in climate services.

The national strategic plan and action plan should be shared widely with all partners and stakeholders who support various elements of the weather and climate services value chain, to inform on their investments. To enhance coordination, partners or stakeholders who choose to support specific activities contained in the action plan should share that information through the NFCS.

4. **CONCLUSIONS**

The five steps in establishing an NFCS are expected to be helpful to NMHSs and their national partners in climate service co-production and delivery, to initiate the process of establishing an NFCS.

The final end products of the five-step approach include the following:

- A functional, cohesive and coordinated NFCS, with a defined governance structure and rules of engagement to deliver on its mandate
- An NFCS strategic plan that gives a shared vision of the stakeholders or participating institutions within the NFCS
- A comprehensive, actionable, time-bound and costed national action plan to implement the NFCS strategic plan. The costed national action plan presents actions to be implemented by the NFCS to improve climate services with agreed clear roles, responsibilities, timelines and budgets

In most parts of the world, the integration of climate services into government policies and decision-making processes is still limited. Hence, the NFCS shall play a key role by developing processes and guidelines that will assist governments, the public and industries in integrating climate services into decision-making to manage the risks and opportunities associated with extreme climate events.

It is expected that an NFCS will mobilize adequate resources to implement the activities in the national action plan to realize the goals and objectives. This may include developing project proposals to mobilize resources. It is also expected that those involved in an NFCS will mobilize resources together or coordinate activities, to optimize the use of available resources and avoid duplication of efforts in parallel programmes.

Countries are encouraged to derive inspiration from this publication and practical experiences from countries that have already initiated their processes of NFCS implementation. WMO is grateful for the lessons these countries have provided and to the national stakeholders within them that shared their experiences.

APPENDIX. STRATEGIC PLANNING TEMPLATE FOR USE BY A NATIONAL FRAMEWORK FOR CLIMATE SERVICES

[This template is based on the Basic Strategic Planning model (WMO, 2016). It is developed for use by an NFCS involving an NMHS and other national institutions, and can be adapted to specific needs as necessary.]

[Place name of NFCS here]

Strategic plan

[Place period for strategic plan here]

[This template is intended to assist an NMHS and other national institutions to establish an NFCS and to develop a national strategic plan and an associated national action plan for improving climate services. It should take into consideration the WMO strategic plan, the GFCS action plan, regional strategic plans, and international, regional and national development initiatives, together with the strategic plans of the institutions involved in the NFCS. The steps outlined in the WMO Integrated Strategic Planning Handbook (WMO, 2016) should be used as a guide when drafting a national strategic plan for an NFCS.]

[All instructions are in italics and bracketed, and should be deleted from the final draft strategic plan.]

EXECUTIVE SUMMARY

[Provide an executive-level presentation of the detailed contents of the national strategic plan and action plan, including an overview of the profile and purpose of the NMHS and other stakeholders, a clear, cogent presentation of how the strategic plan and action plan aim to support the broader strategic goals of the organizations, the benefits to be realized, a realistic time frame for implementation and associated costs.]

1. INTRODUCTION AND BACKGROUND

[Before completing this section, please read the WMO Integrated Strategic Planning Handbook (WMO, 2016), [Chapter 2](#).]

1.1 Introduction

The national strategic plan for improving climate services and the associated national action plan with specific actions to improve climate services provide a strategic direction and appropriate actions for a National Framework for Climate Services (NFCS). These should realize the intended improvements in climate services to enable the public and sectors dependent on weather, climate and water conditions to better manage the risks and opportunities of climate variability and change at all levels. This may be done through the development and incorporation of science-based climate information and prediction services into planning, policy and practice. The roles of National Meteorological and Hydrological Services (NMHSs) and other institutions in the five components (pillars) of the Global Framework for Climate Services (GFCS) (observations and monitoring; research, modelling and prediction; climate services information system; user interface platform (UIP); and capacity development) will vary, depending on the capabilities and capacities of NMHSs and other institutions, in line with their mandated roles at the national level.

Countries' NMHSs have played and will continue to play a key role in gathering observations that form the foundation of climate services. However, for NFCSs to develop user-oriented climate services, the data gathered by the other institutions involved will be vital for NMHSs and research institutions to develop linkages among climate processes and the processes in other climate-dependent sectors in order to provide user-oriented climate services. The efforts to develop

user-oriented products shall benefit from collaborations among NMHSs, and universities and other research institutions, which are important in climate research and modelling efforts. NMHSs will be central in the climate services information system, which uses the outputs from observations. With the help of research, NMHSs will implement operational systems for climate monitoring and prediction to generate climate information and products, thereby ensuring that information and products are made available at national and local levels. Additionally, NMHSs, with experience in dealing with the clients of weather, water and climate services, are well placed to play an important role in broad interaction with users and provide them with better climate services. However, their role in the UIP component has to be largely through various partners or boundary organizations in the different sectors within the countries.

1.1.1 **Purpose of the strategic plan and action plan**

[Describe the purposes of the strategic plan and action plan (what needs to be improved by doing things differently) and the processes used to develop the plans: who was involved (participants), communication and institutionalization processes. This section should also provide an outline of how the plans are organized.]

[See the WMO Integrated Strategic Planning Handbook (WMO, 2016), sections 2.2 and 3.1.]

[Affirm the rationale and purpose of the process, and the reason for developing a strategic plan including:

- *Commitment, ownership and consultation*
- *Parties responsible for managing the process]*

1.1.2 **Strategic planning methodology**

[Describe the process that the NFCS undertook to complete the strategic plan. Explain how the NFCS was organized to develop the plan, and how the planning process was conducted. Include any relevant details on the actual methodology that was used, constraints or limitations that affected the results of the planning exercise, and duration and budget of the strategic planning process. Include national review cycles for updating the plan.]

[To facilitate the above, choose from one or more of the various strategic planning models that are best suited for the needs and capacity of the NFCS. Decide on the strategic planning model(s) to use, the timing, duration and budget of the strategic planning process.]

[A strategic planning process has a strong influence on successfully achieving the expectations of a strategic plan. The process should involve internal and external stakeholders, and the strategic plan should be a consensus document of the NFCS. The head of the NMHS, who is expected to play a leading role in the establishment of the NFCS, should provide leadership, but take into consideration any divergent views of the other institutions and external stakeholders. See the WMO Integrated Strategic Planning Handbook (WMO, 2016), section 2.3.]

1.2 **Background**

Organizational history and structure

[Provide a brief overview of when the NFCS and each institution was established, for what functions, and how the NFCS is organized to carry out its mandate. Highlight relevant achievements of each institution, any existing arrangements for collaboration that the NFCS can take advantage of and the types of climate services that each institution has been providing over the years. Include the structure of the NFCS.]

2. **ENVIRONMENTAL SCAN**

[The environmental scan is done by gathering and analysing relevant global, regional and national information that may affect the activities of NMHSs. It is intended to identify the external and internal challenges and opportunities likely to affect NMHSs in the future.]

Box 9. Key questions for external assessment and analysis

- What are the resources, capacities and weaknesses of external actors in helping to address vulnerability or alter trends?
- What are the main threats to the NMHS and its work?
- What are the main opportunities that could benefit the NMHS and its work?
- Who are the stakeholders?
- Which other organizations are working to provide the same services/products?
- Which other organizations have an interest in and/or influence the NMHS?
- What are the stakeholder priorities, interests and problems?
- How are the relationships with each stakeholder?
- What are the social, political, economic and environmental trends that may affect work in the future? (Which can be influenced? Which cannot be influenced?)

[See the WMO Integrated Strategic Planning Handbook (WMO, 2016), [section 3.2.1](#), which features tools to analyse the internal and external situations of NMHSs (Box 9).]

[This template proposes the use of three complementary tools (as given in the following three subsections), further details of which are given in the WMO Integrated Strategic Planning Handbook (WMO, 2016), [section 3.2.1.1](#).]

2.1 Strengths, weaknesses, opportunities and threats analysis

[See the WMO Integrated Strategic Planning Handbook (WMO, 2016), [section 3.2.1.1.1](#) and [Annex 2](#).]

[Conduct strengths, weaknesses, opportunities and threats (SWOT) analysis. This is a stocktaking exercise that looks at internal capacities, stakeholder needs regarding NFCS responsiveness and the contextual realities in which the NFCS, involving the NMHS and other institutions, operates. The information it captures should provide insights into the advantages, gaps, the current status and intended achievements of the NFCS. Note that the information is to help match NFCS goals, programmes and capacities to the social and economic environment. Table 1 can be used as a guide to conducting SWOT analysis.]

Strengths

[Identify the tangible and intangible attributes that are internal to the NFCS and for which the NFCS has control over. These attributes are often the skills (capabilities) and resources that the institutions involved in the NFCS possess or would attract to invest in the improvement of climate services.]

Weaknesses

[These are factors within the control of the NFCS and institutions involved that hinder the NFCS from meeting its goals. The factors listed here should be suggested areas for improvement.]

Opportunities

[These are the external attractive factors that, if capitalized, will help to close the gap between what the NFCS is doing and what it is expected to do. The time frames by which these could be achieved should be identified.]

Threats

[These are the external factors that are beyond NFCS control, and which could place the mission and operation of the NFCS at risk. The information should also provide an overview of contingency plans identified to address the serious and highly probable risks if they should occur.]

Table 1. Sample SWOT template using the results of the WMO 2016 stakeholder survey^a

<i>Internal</i>	
Strengths [<i>List here all advantages of the organization. What can be relied on to deliver the services?]</i>	Weaknesses [<i>List here anything that could be improved. What is not quite the way it should be yet? What is missing?]</i>
Global reach and membership	Organizational complexity
Expert and experienced staff	Stretched resources
Excellent spirit of cooperation	Bureaucratic inefficiencies
Exchange of data in real time	Poor visibility
Coordination of activities	Some slow implementation
Standards and practices	Inadequate adaptation
Capacity development	Inequalities among Members
	Limited support provided to least developed countries/small island developing States
<i>External</i>	
Opportunities [<i>List here any potential opportunities to push the organization forward that have not yet been taken advantage of.</i>]	Threats [<i>List here anything that might get in the way of achieving goals, such as uncertain funding or relationships that might break down.</i>]
Climate change	Private sector providers
Advances in science and technology	Pressure on budgets
New demands for services	Political/economic instabilities
Implementation of GFCS	Competition
Disaster risk reduction	Developments in aviation
Organizational reform	Changing technology
Partnerships	Loss of focus on core activity

^a The report of the online survey is available at: https://www.wmo.int/pages/about/documents/Report_WMO_Stakeholder_Survey_2016-8July.pdf.

2.2 **Political, economic, sociocultural, technological, legal and environmental analysis**

[Conduct an analysis that provides an understanding of the NFCS external environment relating to political, economic, sociocultural, technological, legal and environmental (ecological) (PESTLE) factors. This multipronged analysis is usually conducted during a stakeholder workshop utilizing outputs from research on the six factors. Relevant international decisions include the 2030 Agenda for Sustainable Development (Sustainable Development Goals), the Sendai Framework for Disaster Risk Reduction 2015–2030, the Paris Agreement and Congress decisions. Considerations should also be given to relevant regional and national decisions.]

[See the WMO Integrated Strategic Planning Handbook (WMO, 2016), [section 3.2.1.1.2](#) and [Annex 3](#), for guidance.]

[Table 2 can be used as a guide when collecting information for PESTLE analysis.]

2.3 **National stakeholder consultation workshop and baseline analysis**

[The national stakeholder consultation workshop should involve the stakeholders established through the process to create the baseline. The issues identified in the baseline analysis should inform the agenda and programme of the workshop. The workshop should identify the role that each institution plays in the NFCS, the timelines for preparing the national strategic plan and action plan for the NFCS and the budget.]

Table 2. Elements for consideration during PESTLE analysis

<i>Political factors</i>	<i>Economic factors</i>
<p>International, regional and national decisions on development paths and areas for action (for example, Congress decisions on WMO priorities, United Nations Sustainable Development Goals, the Paris Agreement, the Sendai Framework for Disaster Risk Reduction, regional strategies and national development policies)</p> <p>Government decisions on funding levels</p> <p>Bureaucracy, corruption level and tax policy (rates and incentives)</p> <p>Import restrictions (quality and quantity)</p> <p>Competition regulation</p>	<p>Risk of losing vital revenues from the aviation sector with potential negative impacts on the sustainability of national infrastructures and availability of core meteorological data as a result of operating in a future highly competitive service delivery environment</p> <p>Resource mobilization</p> <p>Cost recovery policies</p> <p>Volatile global economy</p> <p>Budget cuts implemented by governments</p> <p>Changes in the cost of implementing and operating infrastructure</p> <p>Economic growth, inflation, interest and exchange rates</p> <p>Unemployment trends</p> <p>Credit availability</p> <p>Level of consumers' disposable income and monetary and fiscal policies</p> <p>Price fluctuations</p>
<i>Sociocultural factors</i>	<i>Technological factors</i>
<p>Population safety and security, water and food security, sustainable development, increasing prosperity, enhancing resilience to disasters and climate change, and improving public health</p> <p>Climate change adaptation and mitigation</p> <p>Growing urbanization and expansion of human habitation into previously unoccupied high-risk places</p> <p>Growing demand for high-quality climate services</p> <p>Rapidly changing needs of users</p> <p>Demographic changes</p> <p>Attitudes towards meteorological and hydrological services</p>	<p>Having the required scientific, technological and human resources capabilities to monitor, forecast and issue warnings of extreme climate events and to fulfil GFCs priorities</p> <p>Understanding and integrating the needs of various user communities, including emergency management authorities, into processes to improve the provision of climate services</p> <p>Ability to provide quick, timely, accurate, broadly disseminated and understandable information, as well as high-quality services to inform governments and the public</p> <p>Participating in and having access to research that leads to improved monitoring, predictions and understanding of the changes in weather, climate, water and related environmental conditions at all spatial and temporal scales</p> <p>Building new partnerships with academia, government departments, international and non-governmental organizations, and where appropriate and possible, the private sector and civil society</p> <p>Gathering, storing and exchanging "big data", collecting and sharing crowdsourced data, and working with information through social media channels</p> <p>Impact of automatic weather observing systems on staffing levels</p> <p>Implementation of the WMO Information System and the WMO Integrated Global Observing System</p>

<i>Legal factors</i>	<i>Environmental (ecological) factors</i>
Legal status of an NMHS and its mandate	Desertification, land degradation, heatwaves, floods, drought, sea-level rise and regional impacts
Standards for meteorological and hydrological services	Increased occurrence of severe weather and extreme climate events and associated impacts
Data sharing and management policies	Laws regulating and protecting the environment
Environmental, employment, education, anti-trust, discrimination, copyright and patents/intellectual property law	
Competition laws	
Consumer protection and e-commerce	
Health and safety laws	

The main aim of the workshop is to bring together experts from the NMHS, government departments, universities and research institutions, key decision-makers, partners and practitioners from the institutions related to the initial GFCS priority areas. The workshop will facilitate identification of appropriate mechanisms to improve and sustain the development and delivery of climate information and products to different users. It should discuss any existing arrangements for collaboration among the institutions involved in the NFCS that could be advantageous. Specifically, it should result in: (a) clarity on the leadership and structure of the NFCS, reflecting the roles and responsibilities of each institution involved; (b) enhanced understanding of the needs for climate services in different user sectors; (c) improved knowledge of the existing interface mechanisms and recommendations for improvements where needed; (d) clear understanding of the gaps in each of the five GFCS pillars with the aim of initiating necessary improvements; and (e) strategic guidance on the institutional arrangements, partnerships and processes required to operationalize the NFCS.

Specific objectives of the workshop are to:

- Review the current status of the delivery of climate services at the national level and assess specific needs for climate services in the different climate-sensitive sectors
- Review existing structures for collaboration that the NFCS can build on
- Review the current status of interfacing mechanisms and interactions among climate service providers and users, identify major areas for improvement and recommend effective mechanisms and practices
- Articulate the capacity-building needs in terms of mandates, infrastructure and human resources, in all GFCS components
- Discuss and recommend arrangements for improved production, better access and sustainable operations for climate predictions and services to facilitate the flow of climate information from global and regional scales through to national and local scales
- Discuss and define the next steps for development of the strategic plan and action plan, together with a budget to operationalize the NFCS
- Chart a road map for development and application of climate services in support of the different climate-sensitive sectors at the national level

2.4 **Conclusions from the environmental scan**

[This section should summarize in two to three short but comprehensive paragraphs the strategic issues facing the NFCS identified from SWOT and PESTLE analyses, which involved assessment of the internal and external environments. The information from stakeholder interests, contributions and relationships should also be included. Set out the conclusions from the analysis in terms of the strategic responses that

will be required in order to build on strengths to minimize weaknesses and threats while pursuing opportunities. This is critical for achieving higher levels of performance.]

3. **VISION, MISSION AND VALUES OF THE NATIONAL FRAMEWORK FOR CLIMATE SERVICES**

[This section refers to the WMO Integrated Strategic Planning Handbook (WMO, 2016), [section 3.3.](#)]

3.1 **Vision**

[Describe the adopted vision statement. The vision must indicate the long-term view of the desires or intents of the NFCS. It should say what the NFCS wishes to be. It should be challenging and ambitious yet workable enough to evoke ingenuity of the employees of each institution as far as realization is concerned. It is expected to evoke powerful and compelling mental images of the desired future state of the NFCS. In formulating the vision statement, ensure the following basic questions are answered:

- (a) What is the NFCS intended to do and why is to be established?*
- (b) What type of improvements in climate services does the NFCS want to realize 5–10 years in the future?*
- (c) What does the NFCS aspire to become?]*

[See the WMO Integrated Strategic Planning Handbook (WMO, 2016), [section 3.3.1.1.](#)]

3.2 **Mission**

[Describe the adopted mission statement. The mission must indicate the overall purpose of the NFCS in line with the values and expectations of stakeholders, and for which it is established, while capturing the core businesses as well as those related to the GFCS components. In formulating the mission statement, ensure the following key questions are answered:

- (a) Why is the NFCS established?*
- (b) Who does it intend to serve?*
- (c) What services does it intend to provide?*
- (d) How does it intend to provide services?]*

[See the WMO Integrated Strategic Planning Handbook (WMO, 2016), [section 3.3.1.2](#) for examples of WMO and NMHS mission statements.]

3.3 **Values**

[Describe the adopted values statements, which should represent what is acceptable when conducting the business of the NFCS. The values describe what is important to the NFCS as it carries out its work – the core issues that the NFCS believes to be important in its work and its interaction with others. These values are important as they help inform both the mission and vision statements. Examples of values are integrity, honesty, efficiency, teamwork, equality and excellence.]

[Ensure the NFCS fundamental ethics are outlined.]

[See the WMO Integrated Strategic Planning Handbook (WMO, 2016), [section 3.3.1.3.](#)]

4. STRATEGIC FRAMEWORK

4.1 Strategic goals, objectives and strategies

4.1.1 Goals

[Outline the goals of the NFCS. Limit these to a critical few (five to eight goals). If the goals are realized, it will be evidence to demonstrate that the NFCS is carrying out its mandate (mission). The results that the NFCS will see when it realizes its goals will lay the foundation for the future it envisions (vision statement). Box 10 shows the WMO goal as an example, and Box 11 shows some example NFCS goals.]

[See the WMO Integrated Strategic Planning Handbook (WMO, 2016), [section 3.3.2](#).]

4.1.2 Objectives

[Outline the strategic objectives of the NFCS as illustrated in Box 12. Realization of NFCS goals will largely depend on the degree to which the strategic objectives are accomplished. The objectives are specific, and are distinct from one another. They are measurable, and a time frame is set when they will be accomplished. Objectives should also reflect what could realistically be done given the resources (including time).]

[See the WMO Integrated Strategic Planning Handbook (WMO, 2016), [section 3.3.3](#).]

4.1.3 Strategies

[In Table 3, set out all the high-level planned strategies associated with the strategic goals and objectives. Replace the content in Table 3 with specific information. Box 13 shows examples of WMO strategies.]

[See the WMO Integrated Strategic Planning Handbook (WMO, 2016), [section 3.3.4](#).]

Box 10. Example – WMO goal

“[...] to provide the citizens that we serve with fit-for-purpose, high-quality weather, climate and hydrological services”

Source: WMO (2015b)

Box 11. Examples of NFCS goals

1. Information and climate services; 2. Internal processes and finance; 3. Customers
- **Goal 1:** Climate information system and timely alerts, oriented to specific needs and safety of persons and property
 - **Goal 2:** Population and communities informed and prepared to manage climate extreme events
 - **Goal 3:** Integrated climate information in sectoral plans and projects

[Replace content with NFCS goals. Start with the following:]

Goals that the (NFCS name) has determined to focus on are:

- Strategic goal 1: ...
- Strategic goal 2: ...
- Strategic goal 3: ...

Box 12. Examples of goals and associated objectives

- Strategic goal 1: Climate information system and timely alerts, oriented to specific needs and safety of persons and property:
 - Objective 1.1: Develop the human capital of the institutions involved in the NFCS
 - Objective 1.2: Modernize the weather and climate monitoring systems
 - Objective 1.3: Increase the availability of products and climate services
- Strategic goal 2: Population and communities informed and prepared to manage climate extreme events:
 - Objective 2.1: Strengthen information and communication systems
 - Objective 2.2: Introduce new products and diversified services
- Strategic goal 3: Integrated climate information in sectoral plans and projects:
 - Objective 3.1: Develop research capacity and production of user-oriented scientific climate information for different sectors of development
 - Objective 3.2: Improve the integration of climate information and products into decision-making

[Replace content with the country's own NFCS objectives and goals. Start with the following:]

In keeping with the goals outlined in this plan, the (NFCS name) has developed specific objectives to be achieved throughout the 2020–2023 lifetime of the plan.

The objectives associated with each of the goals are:

- Strategic goal 1: ...
 - Objective 1.1: ...
 - Objective 1.2: ...
 - Objective 1.3: ...
- Strategic goal 2: ...
 - Objective 2.1: ...
 - Objective 2.2: ...
- Strategic goal 3: ...
 - Objective 3.1: ...
 - Objective 3.2: ...

Table 3. Examples of strategies

Goal 1: Climate information system and timely alert, oriented to specific needs and safety of persons and property				
<i>Objectives</i>	<i>Strategies</i>	<i>Outputs</i>	<i>Time frame</i>	<i>Responsibilities</i>
1.1. Develop the human capital of the institution	Educate and train staff	Specialized staff	<i>[Insert relevant information here]</i>	<i>[Insert relevant information here]</i>
	Improve partnerships with universities and regional training centres	Technical and scientific skills improved		
1.2. Modernize the weather and climate monitoring system	Deploy modern technologies for gathering observations and monitoring weather and climate processes	Instruments for observations and climate monitoring installed and operational	<i>[Insert relevant information here]</i>	<i>[Insert relevant information here]</i>
	Introduce modern equipment to process climate information and products	Improved quality of weather and climate observations		
1.3. Increase the availability of products and climate services	Use new information technologies to improve availability of climate information	Improved availability of climate information and products to different sectors	<i>[Insert relevant information here]</i>	<i>[Insert relevant information here]</i>

Goal 1: *[Insert relevant goal.]*

Objective 1.1: *[Insert relevant objective.]*

[Insert relevant information in the table below.]

<i>Strategy</i>	<i>Outputs</i>	<i>Time frame</i>	<i>Responsibilities</i>
1			
2			
3			

Box 13. Examples of WMO strategies

Objective: Implement climate services under GFCS particularly for countries that lack them by:

- (a) Establishing Regional Climate Centres
- (b) Identifying user requirements for climate products
- (c) Developing the climate services information system
- (d) Advancing the sub-seasonal to seasonal prediction skill

Source: WMO (2015b)

5. RISK ASSESSMENT

[Identify risks that are likely to impede achievement of each goal and objective.]

[Identify the events and associated risks and opportunities that are likely to influence the intended achievement of the strategic plan. Use the information to develop a risk management matrix or register. It may be necessary to refer to the [WMO Risk Management Policy and Framework](#), and those of institutions and government as appropriate.]

[See the WMO Integrated Strategic Planning Handbook (WMO, 2016), [section 3.3.5.9](#).]

[Provide a succinct presentation of the major risks to the strategic framework outlined above. Identify the major obstacles to achieving the expectations in the NMHS strategic plan.]

6. DEVELOPING A NATIONAL ACTION PLAN

[Develop an action plan that translates strategies into specific activities and projects to achieve the desired goal objectives. Attach the action plan in an annex to this template. It should capture actions agreed upon by all the institutions involved in the NFCS.]

[See the WMO Integrated Strategic Planning Handbook (WMO, 2016), [section 3.4.1](#).]

[A national action plan presents actions to be implemented to realize the goals agreed upon by the NFCS. It identifies the roles and responsibilities of each institution participating in the NFCS. It also presents the metrics that should be used to measure performance progress.]

7. FINANCING THE STRATEGIC PLAN AND ACTION PLAN

[Using activities and projects listed in the action plan, estimate the costs of each activity to prepare a results-based budget for implementing the strategic plan. Articulate a resource mobilization strategy particularly to address gaps in the budget.]

[See the WMO Integrated Strategic Planning Handbook (WMO, 2016).]

8. IMPLEMENTING THE ACTION PLAN

[As additional financial resources are being mobilized from the development partners by the government, NMHSs and other institutions involved in the NFCS are encouraged to implement priority actions within their areas of responsibilities using resources within the budgets. Relevant existing partnerships and projects could be helpful as a starting point for the NFCS to realize its goals and objectives. The NFCS could take advantage of the other working synergies involving international cooperation in meteorology and hydrology, including in the other sectors, to have experts from the NMHS of a country with higher capabilities in the provision of climate services deployed to support the NFCS. The NFCS could also have a staff exchange programme to enhance skills to deliver some initial products.]

9. MONITORING, EVALUATION AND REPORTING

[Critical to climate service initiatives at community and national levels is M&E, along with establishment of a baseline in order to quantify impacts of the NFCS and coordinated action on climate services on the ground.]

9.1 Monitoring

[Explain how monitoring will be done and who will be responsible. Highlight the key indicators to measure progress. Develop a performance measurement framework on the basis of the goals and objectives, as the foundation for understanding and reporting the results and changes that the NFCS wants to see.]

[See the WMO Integrated Strategic Planning Handbook (WMO, 2016), sections 3.5 and 3.5.1.]

9.2 Evaluation

[Explain/describe how evaluation of the strategic plan will be done, when and by whom.]

[See the WMO Integrated Strategic Planning Handbook (WMO, 2016), section 3.5.]

9.3 Reporting

[Explain how reporting will be done and when, and the outputs that will be produced from M&E. Define reporting timelines (annual, midterm review, etc.).]

[Explain/describe how reporting on the strategic plan will be done, when and by whom as well as the types of outputs/reports that will be produced, including:

- Method/reporting format to be used for reporting on results
- Frequency of production for results-based reports (quarterly, semi-annual or annual)

- *Identification of who will be responsible for producing results-based reports*
- *Types of reports to be provided to members, stakeholders, etc.]*

[See the WMO Integrated Strategic Planning Handbook (WMO, 2016), [section 3.5.8.](#)]

10. **COMMUNICATING THE STRATEGIC PLAN**

[Prepare two to three succinct paragraphs on how the NMHS will effectively communicate the various aspects of the strategic plan including its vision, mission, core values, organizational goal, objectives, expected outcomes and strategies to key audiences and the messages and communication channels that will be used.]

[See the WMO Integrated Strategic Planning Handbook (WMO, 2016).]

11. **ANNEXES**

[Please see the [annexes](#) in the WMO Integrated Strategic Planning Handbook (WMO, 2016).]

ANNEX 1. QUESTIONNAIRE FOR BASELINE ASSESSMENT OF COUNTRY CAPACITIES TO DELIVER AND USE CLIMATE SERVICES

Joint Global Framework for Climate Services Partner Advisory Committee baseline capacity assessment tool – assessing baseline capacities for the co-production, communication and use of climate services at the national level

The main audience for this baseline assessment is national stakeholders with a role in the chain for climate services, linking climate knowledge to action at the national level. This includes National Meteorological and Hydrological Services (NMHSs) and technical sector experts, natural partners of NMHSs, across different climate-vulnerable sectors (agriculture, civil protection, health, water resource management, energy, transport, infrastructure, etc.) that are involved in the process of generating, tailoring and communicating climate services. The sector-specific knowledge of vulnerability and exposure of these partners helps to tailor weather, climate and hydrological forecasts received from NMHSs, transforming information (such as forecast of a heavy rain event) into a service (translation of what a heavy rain event will mean given the local context and advice on preventive measures to adopt). Other stakeholders to engage are professional communicators, extension agents, research institutes, provincial- and district-level planners and community-based organizations, who all play a role in the national chain for climate services.

Climate services thus encompass a range of activities that deal with information about past, present and future climate and on the impacts on natural and human systems. Climate services include the use of simple information like historical climate datasets as well as more-complex products such as weather forecasts and predictions on monthly, seasonal or decadal timescales and trends, also making use of climate projections over multiple decades according to different greenhouse gas emission scenarios. Finally, for them to constitute a true service, climate services must provide advice and support on how to use climate information in the decision-making processes. Users of information produced by meteorological and hydrological services, in collaboration with their technical partners across the different climate-vulnerable sectors, include national-level planners and community-level decision-makers.

Climate services rely on collaboration of multiple stakeholders and institutions at the national level, working together in a coordinated national value chain for climate services, linking knowledge to action.

Section 1. National legislation, policy and institutional frameworks and planning

<i>Capacity requirements</i>	<i>Questions</i>	
	<i>National level</i>	<i>Local level (province/district/community)</i>
National legislation on climate services	Is there national legislation or a mandate organizing the delivery of climate services?	Are there legal provisions regarding the delivery of climate services at the local level?
Strategy/policy/plan	Is there a national strategy/policy for climate services? Is it fully or partially enacted? Does it have clear goals and responsibilities? Are roles and responsibilities for the generation, tailoring and communication of climate services at central and local levels clearly outlined?	

<i>Capacity requirements</i>	<i>Questions</i>	
	<i>National level</i>	<i>Local level (province/district/community)</i>
	<p>Is there a national action plan for climate services?</p> <p>Is it fully articulated with relevant plans of action (disaster risk reduction (DRR), food security, agriculture, etc.)?</p> <p>Does it specify coordination mechanisms among national stakeholders including line ministries, sectoral users, NMHSs, etc.?</p> <p>Does it set clear and achievable timelines by which activities have to be finalized?</p> <p>To what extent are gender issues addressed by national legislation/policy/strategy on climate services?</p>	
National Framework for Climate Services	<p>What is the institutional position of the NMHS in the country?</p> <p>What are the institutional arrangements regarding the provision of climate services at the national level (mandate, framework, coordination with other mechanisms, etc.)?</p>	<p>What is the institutional position of the NMHS at the local level?</p> <p>What are the institutional arrangements regarding the provision of climate services at the local level?</p>
Coordination mechanism	<p>Is there a national coordination mechanism for climate services?</p> <p>If yes, please describe it (members, roles and responsibilities, frequency of meetings, etc.)</p> <p>Is the national institution/service in charge of climate and hydrological services a member of another coordination mechanism (DRR platform, food security, emergency preparedness and response, etc.)?</p> <p>If yes, please describe its roles and responsibilities</p>	
Early warning systems (EWSs)	<p>Does a multi-hazard national EWS exist at the national level?</p> <p>What mechanisms are in place to support coordination of EWSs at both national and local levels?</p> <p>What is the position of NMHSs (or other national structures in charge of climate services) in the coordination mechanism for the EWS?</p>	<p>Does a multi-hazard national EWS exist at the local level?</p>
User interface platforms	<p>Does a framework exist enabling regular interaction among line ministries/sectors and NMHSs?</p> <p>Are interactions among NMHSs, sector technicians and national-level users institutionalized or ad hoc?</p>	<p>Does a framework exist enabling regular interaction among local-level users and NMHSs?</p> <p>Are interactions among local NMHS agents, sector technicians and local users institutionalized or ad hoc?</p>

<i>Capacity requirements</i>	<i>Questions</i>	
	<i>National level</i>	<i>Local level (province/district/community)</i>
Role of research	<p>Does a memorandum of understanding exist between climate research universities/laboratories and NMHSs, enabling links among research and operational climate services delivery? Which institutions are involved in climate services research? What are the main climate research projects ongoing? Are climate research focuses/priorities driven by end-user needs? Are coordination mechanisms in place with stakeholders involved in the national chain for climate services delivery (NMHSs, line ministries, etc.)?</p>	
Private providers	<p>Are there other organizations (private, commercial, etc.) providing climate and/or hydrological services? What is the institutional structure, at both national and local levels, for provision of early warnings?</p>	
Resources	<p>Are there adequate resources (office space, equipment, finance, etc.) at the disposal of the different agencies providing climate services?</p>	<p>Are there adequate resources (office space, equipment, financial, etc.) at the disposal of the different local agencies providing climate services?</p>
Budget	<p>Is the national action plan/policy/strategy on climate services funded from the national budget or supported by donors? Is it adequately funded? Are there funding gaps?</p>	

Section 2. Capacities for production, tailoring and communication of climate services at the national level

Capacity requirements	Questions	
	National level	Local level
Mapping of existing initiatives on climate services	<p>What are the existing initiatives on climate services at the national level?</p> <p>How does each contribute to advancing the five pillars of the Global Framework for Climate Services?</p>	<p>What are the existing initiatives on climate services at the local level?</p>
Climate information flow	<p>Who are the first-level users of climate information at the national level?</p> <p>What climate information products/services do national-level users currently receive in the specific priority areas?</p> <p><i>[Insert table where respondents can specify types of products received (climate monitoring products, seasonal /interannual/decadal predictions, projections, etc.)]</i></p> <p>DRR and preparedness sector Disaster management sector Agricultural sector Health sector Water resources management sector (including sanitation) Energy sector Other sectors (please specify)</p> <p>How is this information accessed by each sector? At what level?</p> <p>How does each sector use climate-related information?</p> <p><i>[Create a decision tree that maps which products are available and what uses sector experts make of them]</i></p> <p>Are the types of climate information products each sector receives appropriate?</p> <p>For each sector, what are the outstanding climate information products needed that are not currently provided?</p> <p>How would the additionally requested climate information products be used?</p> <p>Are there feedback mechanisms in place to assess the relevance and quality of the product/service received? Is there a feedback loop to the research?</p> <p>What types of feedback should be provided? What are the best platforms and channels?</p>	<p>Who are the first-level users of climate information at the local level?</p> <p>What climate information products/ services do local-level users currently receive?</p> <p><i>[Insert table where respondents can specify types of products received (climate monitoring products, seasonal/interannual/decadal predictions, projections, etc.)]</i></p> <p>How is this information accessed locally? At what level?</p> <p>How do local technical experts use this information?</p> <p><i>[Create a decision tree that maps which products are available and what uses local sector experts make of them]</i></p> <p>Are the types of climate information products each sector receives appropriate?</p> <p>Are there feedback mechanisms in place to assess the relevance and quality of the product/service received? Is there a feedback loop to the research?</p> <p>What types of feedback should be provided? What are the best platforms and channels?</p>

Capacity requirements	Questions	
	National level	Local level
Co-production of a climate service	<p>To what extent does the NMHS develop climate services tailored to the needs of users?</p> <p>Is climate information tailored to the different sectors/specific users?</p> <p>To what extent is climate information currently tailored for final users at the national level?</p> <p>Who are the final users at the national level?</p> <p>Is the climate information tailored for specific users?</p> <p>How is the tailoring carried out? By whom?</p>	<p>To what extent is climate information currently tailored for final users at the local level?</p> <p>For which final users at the local level?</p> <p>How is the tailoring carried out? By whom?</p> <p>Is climate information translated into different languages?</p> <p>To what extent is traditional/local knowledge integrated within climate-related information products, services and tools?</p>
Capacities for tailoring co-production	Are there sufficient capacities in-country to tailor climate information to the needs of different sectors/specific users?	Are there sufficient capacities in-country to tailor climate information to the needs of local-level users?
Communication channels for climate services delivery	<p>Are the communication channels through which national-level users receive climate information appropriate?</p> <p><i>[Insert table showing relevance, quality, reliability; give examples]</i></p> <p>Are the uncertainties of the climate information also conveyed? How?</p> <p>Are there mechanisms to support two-way dialogue/feedback between institutions/organizations providing climate-related information products, services and tools and users at the national level?</p> <p>How are climate-related early warnings currently disseminated and to whom?</p> <p>Are there national public awareness initiatives to raise awareness of existing climate information services and increase interest of potential users?</p> <p>How effective are they?</p>	<p>Are the communication channels through which local-level users receive climate information/services appropriate?</p> <p>Are the uncertainties in the climate information also conveyed? How?</p> <p>Are there mechanisms to support two-way dialogue/feedback between institutions/organizations providing climate-related information products, services and tools and users at the local level?</p>
Capacities for communication	Have professional communicators been trained in communication of climate services and warnings at a large scale?	Have local-level intermediaries been trained in communication of climate services and warnings at a large scale?
Gender and social differentiation	To what extent are local gender specificities and social differentiation taken into account in production of climate-related information products, services and tools?	<p>What steps are taken to ensure that marginalized social groups have equal access to information?</p> <p>Are mechanisms in place to ensure that both the format of products/services/tools and the way they are delivered take into account the needs of the most-marginalized groups within the most-vulnerable communities?</p>

<i>Capacity requirements</i>	<i>Questions</i>	
	<i>National level</i>	<i>Local level</i>
Capacities for climate data generation, management and monitoring	<p>What category is the NMHS in according to the WMO categorization of NMHSs (categories 1–4)?</p> <p>Are there sufficient capacities in-country to manage climatic data?</p> <p>Are climate data digitized?</p> <p>To what extent are climate data controlled and homogenized?</p> <p>Are there gaps in the climate data record?</p> <p>Have there been programmes for data rescue?</p> <p>Is there a central repository/database for climate data?</p> <p>Are different databases integrated?</p> <p>Are there available products that are derived from the climatic database? Are they centralized in an open accessible database?</p> <p>Is there a country climatic atlas?</p> <p>What is the reference climatological period in use?</p> <p>Is there a permanent monitoring system for climate and information systems for El Niño–Southern Oscillation and other meaningful regional climate dynamics?</p> <p>Is there a defined national observation network for climatic purposes?</p> <p>Are there analyses of climatic extreme events at national and subnational levels?</p> <p>Are there analyses of climatic trends and detection of climate change at national and subnational levels?</p> <p>Are there data derived from climate change scenarios for analysis and application?</p> <p>How are these data used/shared with different stakeholders and decision-makers?</p>	
Existing staff/capacities	<p>Are there adequate technical competencies^a for the production, tailoring and communication of climate services at the national level?</p> <p>Within each priority area:</p> <p>Have mandated staff/focal points been designated on climate services?</p> <p>Have they undergone any training on climate services?</p> <p>Are they equipped to carry out their responsibilities on climate services for the sector?</p> <p>Do they have the full support of leadership within their agency?</p> <p>To what extent are they empowered?</p>	<p>Are there adequate competencies for the production, tailoring and communication of climate services at the local level?</p>

<i>Capacity requirements</i>	<i>Questions</i>	
	<i>National level</i>	<i>Local level</i>
Educating for a changing climate	<p>Are climate services inscribed into training curricula for national extension services?</p> <p>Is communication training inscribed into national/regional curricula for NMHS staff and personnel?</p> <p>Is there university-level education in fields related to climate/climate services?</p>	
Resources for climate research activities and trainings	<p>Is there collaborative research on climate services among different institutions at the country level?</p> <p>Are there sufficient resources to carry out climate research activities?</p> <p>Are there adequate resources to support training of staff working on the development of climate-related information products and services?</p>	

- ^a For the purposes of this assessment tool, competencies are defined as the specialized knowledge, skills and behaviours required to undertake a particular role or job. Normally, acquiring these competencies will require job-specific education and training that goes beyond a typical university undergraduate degree course (see WMO, 2015a). A distinction is also drawn between “narrow” technical competencies and the wider set of capabilities that can include management and leadership skill sets as well as personal skill sets such as time management and working in teams. These are all required to ensure the quality of the climate service. Typically, the capability sets are defined at the national level as, in many cases, they link to qualifications, pay grades and organizational structure, while the competencies are set at an international level to ensure consistency of approach and outcome. Depending upon the context, competencies can be applied at an individual level or at an institutional level (that is, does the institution collectively possess the required competencies to undertake specific roles and tasks?). As each institution is different, how the institution organizes its workforce to produce the required products to the required standards is the decision of the institution. The clients just need to know that the institution has the people and processes and is organized in such a way that the products have been created, reviewed and communicated by personnel who are competent at that particular part of the chain. In some institutions, a small group of people may do everything, or in others, many people could contribute to parts of the production chain.

Section 3. Capacities in place for use, mainstreaming and evaluation of climate services

Capacity requirements	Questions	
	National level	District/local level
Users of climate services	<p>What are the main national institutions and organizations using climate services at the national level?</p> <p><i>Questions for final end users at the national level:</i></p> <p>How does the institution/organization access climate services (online platforms, bulletins, information directly shared, etc.)?</p> <p>For which purposes does the organization's structure need climate services?</p> <p><i>[Create a decision tree that maps which services are available and what uses final users make of them]</i></p> <p>Are climate services tailored for the needs?</p> <p>What are the main improvements required for a more-tailored service?</p>	<p>What are the main institutions and organizations using climate services at the local level?</p> <p><i>Questions for final end users at the local level:</i></p> <p>How does the institution/organization access climate services (online platforms, bulletins, information directly shared, etc.)?</p> <p>For which purposes does the organization's structure need climate services?</p> <p><i>[Create a decision tree that maps which services are available and what uses final users make of them]</i></p> <p>Are climate services tailored for the needs?</p> <p>What are the main improvements required for a more-tailored service?</p>
Mainstreaming climate services into sectoral policies, strategies and plans	<p>Is there a process for integrating climate services into relevant sectoral policies, strategies and plans (rural development, health, natural resource management, etc.)?</p> <p>Are there competencies at the national level to facilitate a climate services mainstreaming exercise in support of the sectors at the national level?</p> <p>Are there specific sectoral tools/methodologies available to guide the mainstreaming process?</p>	<p>Is there a process for integrating climate services into relevant sectoral policies, strategies and plans (rural development, health, natural resource management, etc.) at the local level?</p> <p>Are there competencies at the local level to facilitate a climate services mainstreaming exercise in support of the sectors at the local level?</p> <p>Is there access to specific sectoral tools/methodologies available to guide the mainstreaming process?</p>
Evaluation of climate services	<p>Are the benefits and lessons learned from using climate services evaluated and documented among national-level users?</p> <p>Does a specific methodology/tool exist for measuring the benefits of using climate services at the national level?</p>	<p>Are the benefits and lessons learned from using climate services evaluated and documented among local-level users?</p> <p>Does a specific methodology/tool exist for measuring the benefits of using climate services at the local level?</p>

ANNEX 2. GUIDE FOR MAPPING STAKEHOLDERS TO INVITE TO NATIONAL CONSULTATIONS

Questions that can help define stakeholders

Proceed with the following specific tasks:

- **Identification of all climate-driven problems encountered in the country that climate services, at all timescales, could play a role in resolving:**
 - **Hazards** (civil protection/disaster prevention):
 - Floods
 - River floods
 - Droughts
 - Strong winds
 - Thunderstorms
 - Lightning
 - Hurricanes/tropical cyclones
 - Others
 - **Diseases and epidemics** sensitive to weather/climate (health):
 - Cholera
 - Diarrhoea
 - Typhoid
 - Influenza
 - Malaria
 - Meningitis
 - Rift Valley fever
 - **Food security** (agriculture, livestock and fisheries):
 - Excess/deficit rainfall affecting national production
 - Pest infestations (for example, locusts and army worms) and other invasive species (for example, weeds such as hyacinth, or weaver birds (*Quelea quelea*))
 - Crop diseases
 - **Water resources:**
 - Dam and reservoir management
 - Irrigation
 - Ecosystem flow
 - Groundwater and surface water recharge
 - Water supply to urban areas (for drinking, sanitation and industrial use)
 - Water quality
 - Other **key sectors** affected by climate/weather variability and change
- **Identification of stakeholders working on each problem (potential actors in the production and communication of climate services across the information chain), at all levels of decision-making from national to community levels:**

Questions to ask:

- Who are the key stakeholders already mandated to provide climate information and/or climate services to vulnerable communities?

- Who is making use of the information/services, and whose task could be improved with climate information/services?
- Who has a potential interest in utilizing climate services?
- Who are the critical decision-makers/institutions to invite to the discussion table, in order to establish a National Framework for Climate Services (NFCS)?

Selection criteria:

- Decision-makers of highest political rank (to anchor the process)
- Up and coming early-career professionals and technicians (to sustain the process)

Key issues to address for an NFCS:

- Requisite processes to enable information flow from the National Meteorological and Hydrological Service (NMHS) to relevant institutions (for example, a memorandum of understanding) for the provision of salient climate services to vulnerable communities
- Define an appropriate institutional framework for climate service provision and clarify institutional mandates by determining:
 - Who is in charge of producing the information
 - Who is in charge of interpreting and packaging the information for target end users (climate service production – all partners in this endeavour)
 - How the chain of information works
- Determine further demand for climate services from other stakeholders (not present at the workshop)
- Firmly place the NMHS at the centre of development of the NFCS by:
 - Consensually agreeing to define an appropriate institutional framework for the NFCS
 - Establishing an NFCS, starting with the NMHS and ending with the vulnerable communities as end users

ANNEX 3. EXAMPLE OF A USER INTERFACE PLATFORM

Integrated Agricultural Advisory programme in India

The Integrated Agrometeorological Advisory Service programme has been operating in India in its current form since 2008, reaching more than 3 million farmers. The programme was created after a series of pilot-level experiments that began in 1988, led by the National Centre for Medium Range Weather Forecasting (NCMRWF).

Agrometeorological advisories were first initiated in 1976 to provide state-level forecast-based advisories to farmers based on short-range weather forecasts issued by the India Meteorological Department. Made available to farmers 1 day in advance, these advisories were inadequate for planning weather-based agricultural practices and/or undertaking precautionary measures, which required a much longer lead time.

In agriculture, location-specific weather forecasts in the medium range (3–10 days in advance) hold greater salience for farmers. In addition, forecasts issued need to be fine-tuned to the specific requirements of farmers, particularly in recommending activities and modifications to specific farm-level practices.

Keeping these needs in mind, NCMRWF was established in 1988 by the Government of India as a scientific mission to develop operational numerical weather prediction models for forecasting weather in the medium range. To disseminate these forecasts and build forecast-based agricultural advisories, Agro Meteorological Field Units (AMFUs) were created across the country, giving 127 agroclimatic zones in total.

By 2006, 86 fully functioning AMFUs, primarily located in state agricultural universities and agricultural research stations, were receiving weather forecasts from NCMRWF twice a week, with each forecast valid for 4–5 days. Based on these forecasts, and in consultation with a team of agricultural scientists, AMFUs prepared agricultural advisory bulletins. The advisories, prepared in English and in a local language, were then disseminated to farmers through a variety of communication channels, including radio, television, newspapers, telephone, posters and sometimes meetings. Owing to the expansive nature of its production and dissemination, the Integrated Agrometeorological Advisory Service was soon held as an example of a successful multi-institutional and multidisciplinary operation (Venkatasubramanian et al., 2014).

Source: Tall et al. (2014)

ANNEX 4. SAMPLE PROGRAMME FOR A NATIONAL CONSULTATION WORKSHOP ON CLIMATE SERVICES

	<i>Session</i>	<i>Objective</i>	<i>Expected outcome</i>
Day 1			
	1. Opening and setting the stage	Opening Workshop perspective Results of baseline assessment	Clarity on the objective of the workshop and the overall intended outcomes
	2. Experiences in climate services	Review and share experiences on the status of climate services in the country and assess specific needs for climate services in the different climate-sensitive sectors Review the current status of interfacing mechanisms and interactions among climate services providers and users, identify major areas for improvement and recommend effective mechanisms and practice	Establish status and needs for climate services Establish existing interfacing mechanisms and areas for improvement
	3. Capacity-building	Articulate the capacity-building needs in terms of mandates, infrastructure and human resources, in all the components of the Global Framework for Climate Services	Establish capacity development needs
Day 2	4. Improving climate services	Discuss and recommend arrangements for improved production, better access and sustainable operations for climate predictions and services, to facilitate the flow of climate information from global and regional scales through to national and local scales	Processes to improve climate services
	5. Governance	Agree on a governance structure for the National Framework for Climate Services (NFCS) – one that brings together all relevant national actors Agree on roles and responsibilities of institutions involved in the NFCS	Governance structure of the NFCS Roles and responsibilities of each institution
	6. Strategic planning	Discuss and agree on key elements and next steps for developing a strategic plan and action plan to operationalize the NFCS	Elements to develop the national strategic plan and action plan
	7. Way forward	Agree on the next steps for establishing the NFCS and for developing the strategic plan and action plan	

ANNEX 5. EXAMPLE OF A NATIONAL FRAMEWORK FOR CLIMATE SERVICES

National Framework for Climate Services in Cameroon

The process for defining an institutional and coordination mechanism for a National Framework for Climate Services (NFCS) in Cameroon was participatory and inclusive. The first national consultation workshop was held in December 2015, and it took a year of preparation to arrive at the final national action plan in December 2016. During the preparation phase of the action plan, a pre-validation workshop was convened by the National Meteorological and Hydrological Service (NMHS) with key stakeholders to discuss the arrangements, based on the specific context of the country, for analysing the benefits and disadvantages of the different models of anchoring and governance of the NFCS. The participants of the workshop recommended and mandated a restricted technical group to work on finalization of the action plan as well as to study and propose an adequate and effective institutional anchorage for Cameroon. The technical group comprised experts from the National Meteorological Service, the National Observatory on Climate Change (ONACC), the Permanent Secretariat of Administrative Reform, a representative from the Prime Minister's office, a legal expert and an independent consultant who was also a facilitator of the workshop.

Two technical retreats were organized near Yaoundé, with the support and mediation of the United Nations Development Programme country office. During these, conversations took place that led to an objective review of the respective capacities and mandates of each institution trying to play a role in the governance of the NFCS. The group finally agreed on an institutional anchoring of the National Framework at the level of the Prime Minister's office (with the decree of creation of the NFCS endorsed by the Prime Minister), with a steering committee and a permanent secretariat whose configurations were the following:

- Steering committee (policymaking and decision-making body):
 - President: Ministry of Transport, tutelage of the NMHS
 - Vice-Chair: Ministry of the Environment, Nature Conservation and Sustainable Development

- Permanent Secretariat (technical and operational coordination):
 - Lead: ONACC
 - Assistant Lead: National Meteorological Service

The final configuration of the NFCS reflects the national consensus and is based on an analysis of capacities and comparative advantages of each lead institution in the institutional landscape for climate services in Cameroon, giving a chance for successful implementation of the NFCS.

ANNEX 6. EXAMPLES OF GOVERNANCE STRUCTURES ADOPTED

Figures 1–4 provide examples of governance structures adopted in Niger, Senegal, Côte d'Ivoire and South Africa.

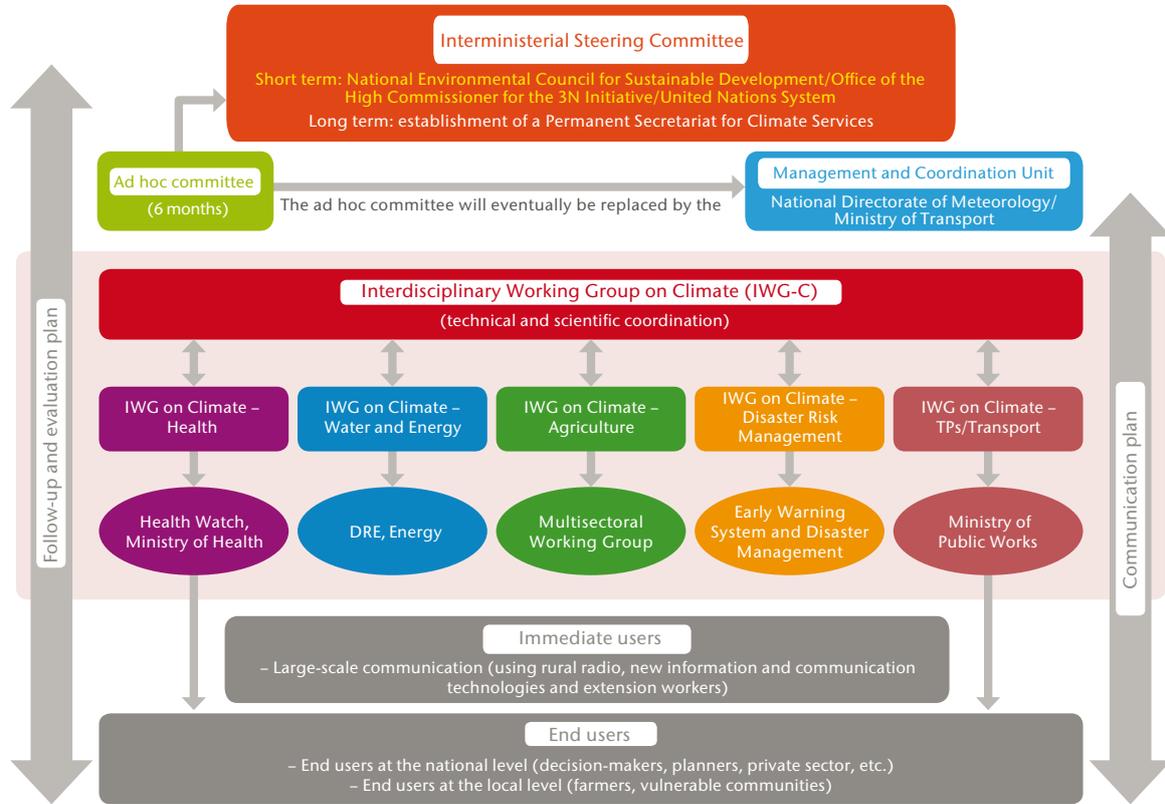


Figure 1. Governance structure of the National Framework for Climate Services of Niger (DRE = Direction des Ressources en Eau; Min TP = Ministère des Travaux Publics)

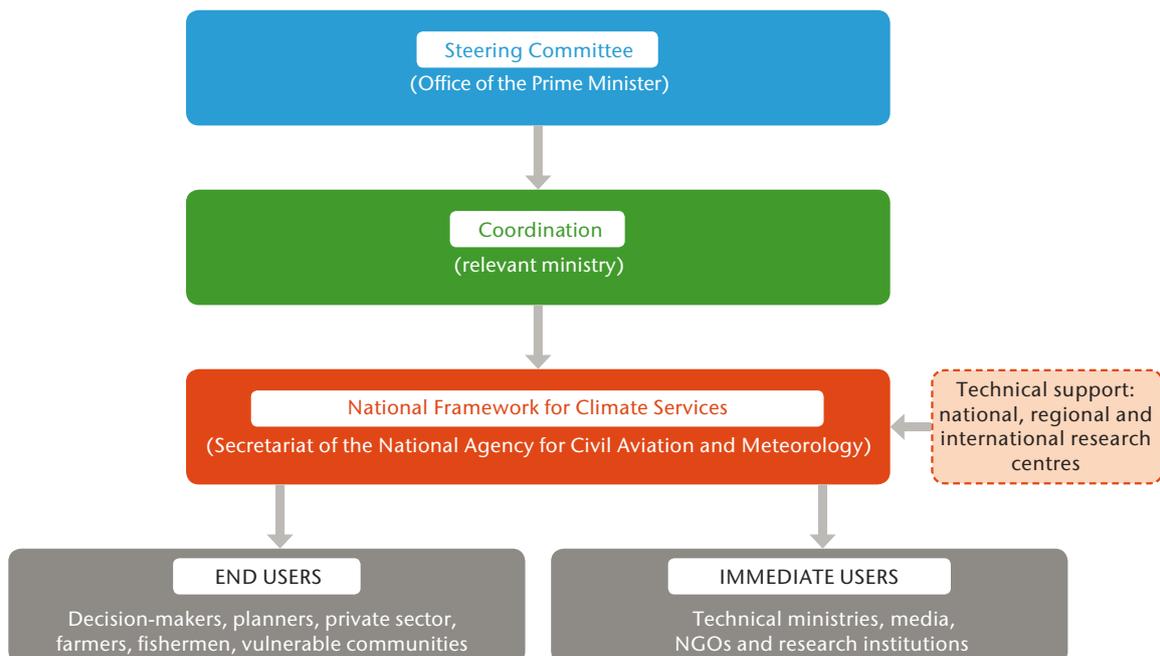


Figure 2. Organigram of the National Framework for Climate Services of Senegal (NGO = non-governmental organization)

ANNEX 7. SAMPLE TEMPLATE FOR A NATIONAL DECREE TO ESTABLISH A NATIONAL FRAMEWORK FOR CLIMATE SERVICES

[Please adjust as appropriate to suit the structure of a decree in the country.]³

DO 1 The Government of (Country):

- OP 1** Decides to establish a National Framework for Climate Services (NFCS) to strengthen production, availability, delivery and application of science-based climate prediction and services in the country;
- OP 2** Requests the Secretary-General of WMO to extend support to the NFCS;
- OP 3** Decides that the NFCS will coordinate and facilitate collaboration among institutions to produce and share user-oriented climate services;
- OP 4** Decides further that the NFCS shall focus on all the pillars of the Global Framework for Climate Services relating to improvement of climate services in the country;
- OP 5** Invites the development partners to support the work of the NFCS to enable it to achieve its goals as presented in the strategic plan;
- OP 6** Decides that all institutions work together to ensure that climate services are improved for the benefit of society and economy.

³ An example from the National Framework decree of Chad can be found at: <http://gfcs.wmo.int/node/1009>.

REFERENCES

- Diarra, D.Z. and K. Stigter, 2008: *Operational Meteorological Assistance to Rural Areas in Mali. Development Results Perspectives: Conclusions and Recommendations* (translated from French), International Society for Agricultural Meteorology, <http://www.agrometeorology.org/files-folder/repository/MaliEng.pdf>.
- Tall, A., A. Jay and J. Hansen, 2012: *Scaling Up Climate Services for Farmers in Africa and South Asia*. CGIAR Research Program on Climate Change, Agriculture and Food Security, Workshop Report held at Saly, Senegal, 10–12 December 2012, Working Paper No. 40, <https://cgspace.cgiar.org/rest/bitstreams/19521/retrieve>.
- Tall, A., J. Hansen, A. Jay, B. Campbell, J. Kinyangi, P.K. Aggarwal and R. Zougmore, 2014: *Scaling up Climate Services for Farmers: Mission Possible*. Learning from Good Practice in Africa and South Asia. CGIAR Research Program on Climate Change, Agriculture and Food Security, Report No. 13, www.ccafs.cgiar.org.
- Venkatasubramanian, K., A. Tall, J. Hansen and P. Aggarwal, 2014: *Assessment of India's Agro-Meteorological Advisory Service from a Farmer Perspective*. CGIAR Research Program on Climate Change, Agriculture and Food Security, Working Paper No. 54, <https://cgspace.cgiar.org/rest/bitstreams/34467/retrieve>.
- World Meteorological Organization, 2010a: *WMO Position Paper on Global Framework for Climate Services*. Geneva.
- , 2010b: *WMO Position Paper on Guidelines for National Meteorological Services in the Establishment of National Climate Services*. Geneva.
- , 2011: *Climate Knowledge for Action: A Global Framework for Climate Services – Empowering the Most Vulnerable* (WMO-No. 1065). The Report of the High-level Taskforce for the Global Framework for Climate Services. Geneva.
- , 2014: *Annex to the Implementation Plan of the Global Framework for Climate Services – User Interface Platform Component*. Geneva.
- , 2015a: *Guide to the Implementation of Education and Training Standards in Meteorology and Hydrology, Volume I – Meteorology* (WMO-No. 1083). Geneva.
- , 2015b: *WMO Strategic Plan 2016–2019* (WMO-No. 1161). Geneva.
- , 2016: *WMO Integrated Strategic Planning Handbook* (WMO-No. 1180). Geneva.

For more information, please contact:

Global Framework for Climate Services Office

7 bis, avenue de la Paix – P.O. Box 2300 – CH-1211 Geneva 2 – Switzerland

Filipe Lúcio – Tel.: +41 (0) 22 730 85 79 – E-mail: flucio@wmo.int

<http://gfcs.wmo.int>