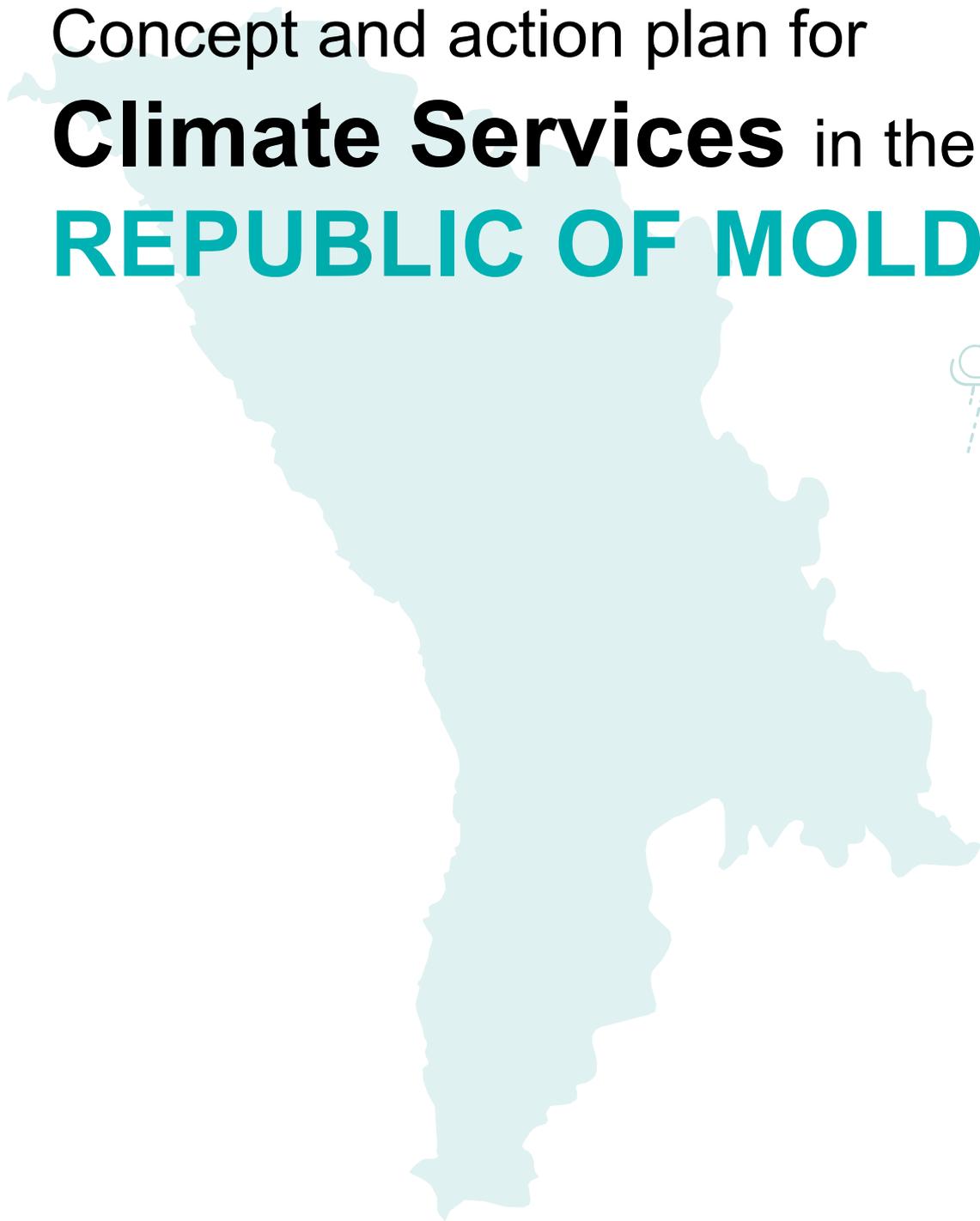


Concept and action plan for **Climate Services** in the **REPUBLIC OF MOLDOVA**



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List of abbreviations

ACSA	National Agency for Rural Development
ADA	Austrian Development Agency
FAO	Food and Agriculture Organization of the United Nations
GFCS	Global Framework for Climate Services
GFDRR	Global Facility for Disaster Reduction and Recovery
MARDE	Ministry of Agriculture, Regional Development and the Environment of the Republic of Moldova
Moldatsa	Air Traffic Services Authority of the Republic of Moldova
NFCS	National Framework for Climate Services
NGO	Non-governmental organisation
PAC	Partner Advisory Committee for the Global Framework for Climate Services
SHS	State Hydrometeorological Service of the Republic of Moldova
SMS	Short message service
TV	Television
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
USSR	Union of Soviet Socialist Republics
WMO	World Meteorological Organization

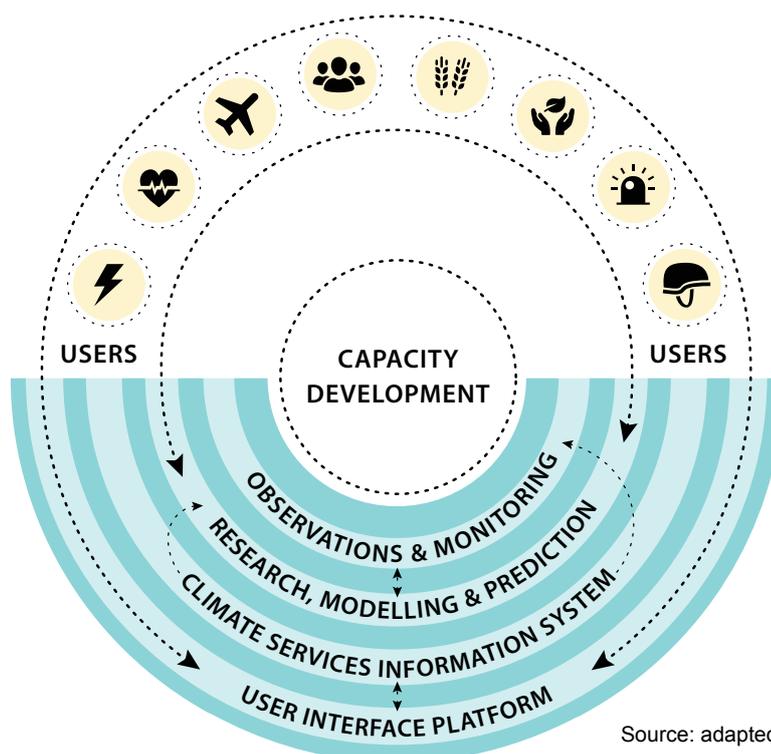
INTRODUCTION

The vision of the Global Framework for Climate Services (GFCS)¹ is to enable better management of the risks of climate variability and change and adaptation to climate change through the development and incorporation of science-based climate information and prediction into planning, policy and practice on the global, regional and national scales. Climate observations, along with complementary socio-economic and other data, must be effectively integrated to develop and provide users of climate services – farmers, public health officials, disaster risk reduction managers, water resources administrators and others – with information that will help them minimise losses due to climate variability and change and to manage natural and human systems effectively.

The GFCS accelerates and coordinates the technically and scientifically sound implementation of measures to improve climate-related outcomes. With its broad participation and reach, the framework enables the development and application of climate services to assist decision-making at all levels in support of addressing climate-related risks. The five GFCS components (Figure 1.1) are:

- observations and monitoring;
- climate services information system;
- research, modelling and prediction;
- user interface platform;
- capacity development.

Figure 1.1 Functional components (pillars) of GFCS



Source: adapted from WMO 2018

OBSERVATIONS AND MONITORING

Effective climate services require observations of various types, of adequate quality and quantity and at the right place and time. Both surface-based and space observations are needed for physical and chemical climate variables of the atmosphere, land and oceans, including hydrologic and carbon cycles and the cryosphere. In addition, delivering useful climate services also requires the availability of socioeconomic, biological and environmental data.

RESEARCH, MODELLING AND PREDICTION

During the past few decades, national and international investments in climate observations, research and modelling have resulted in significant progress in experimental and practical climate prediction and projection. Systematic conversion of existing climate knowledge into practical solutions requires a change in how climate research is conducted. In order to meet the diverse needs for climate services, professional networks should be developed to unite climate researchers and practitioners in the field.

CLIMATE SERVICES INFORMATION SYSTEM

The information system is the principal mechanism through which information about climate – past, present and future – is archived, analysed, modelled, exchanged and processed. It produces and delivers authoritative climate information products through operational mechanisms, technical standards, communication and authentication. Its functions include climate analysis and monitoring, assessment and attribution, prediction (monthly, seasonal, decadal) and projection (centennial scale).

USER INTERFACE PLATFORM

The user interface platform offers structured means for users, researchers and climate service providers to interact and ensure that user needs are met. The objective of the user interface platform is to promote effective decision-making in view of climate considerations. The need to make climate-related decisions will be the driver for providers and users to develop more useful climate information.

CAPACITY DEVELOPMENT

The GFCS aims to develop the capacity of countries to apply and generate climate information and products relevant to their particular concerns. Since many countries lack policies, institutions or human resources to enable them to take advantage of new or existing climate data and products or to establish a national dialogue on these issues, the capacity development component can be seen as a foundation that links and supports the other four pillars.

Source: adapted from www.wmo.int/gfcs/.

The GFCS focuses on developing and delivering services in five priority areas that address issues basic to the human condition and present the most immediate opportunities for benefitting human safety and well-being. These are: agriculture and food security; disaster risk reduction; energy; health; and water.

The Global Framework for Climate Services is promoted and facilitated by the World Meteorological Organization (WMO) in cooperation with the GFCS Partner Advisory Committee (PAC). Following the PAC's identification of the Republic of Moldova as a priority country, the World Bank as PAC member, together with

the Global Facility for Disaster Reduction and Recovery (GFDRR), volunteered to lead efforts in the country and has supported the conceptualisation and establishment of a National Framework for Climate Services (NFCS) in Moldova.²

The work started in December 2017 with the support of Zoï Environment Network, a Switzerland-based international non-profit organisation specializing in environmental information, communication and capacity-building, and is carried out in close cooperation with Moldova's State Hydrometeorological Service (SHS) and the Ministry of Agriculture, Regional Development and the Environment of the Republic of Moldova (MARDE).

As a first step, a national consultation workshop was organised in Chisinau on 26–27 June 2018³ in order to discuss the status quo and the way forward for climate services in Moldova. The main objective of the meeting was to bring together the producers and users of climate information in Moldova with international organisations and experts to discuss climate services. Another objective was to share experience and perspectives of other countries. More than 70 participants took part in the event, representing national, local and regional authorities (including the capital city of Chisinau, the autonomous territorial unit of Gagauzia, the Transnistrian region, and selected rural communities), NGOs, academia, research and business. Users and producers of information were equally present.

Discussions about the future of climate services in Moldova were based on the conceptual outline of the NFCS prepared prior to the meeting. Among other inputs, the outline leaned on a series of in-depth interviews with producers and users of hydrometeorological information in Moldova, organised in February–April 2018 to help inform the national consultations and further NFCS development. Respondents represented 14 governmental, academic, non-governmental and business organisations and included the producers of primary data, general-purpose or user-targeted information as well as the users of primary or processed data, forecasts and other information products from agriculture, water management, healthcare, disaster response, energy, municipal services, science and hydrometeorology.

Based on the discussions at the consultation workshop, a concept and an action plan for the National Framework for Climate Services in Moldova was drafted and presented as a discussion document during the NFCS endorsement workshop in Chisinau on 6 December 2018.⁴ The workshop endorsed in principle and further elaborated on the concept and action areas, confirming the commitment of key institutional stakeholders in Moldova to improving the provision, access to, and the use of climate and hydrometeorological information.

The SHS being Moldova's key provider of hydrometeorological data, the community of the producers of climate information and services in the country is broader. The NFCS is thus expected to provide a coordination mechanism for addressing issues related to the production and the delivery of climate services, and to serve as a platform for promoting effective collaboration and cooperation among the various players in the field.

The concept elaborates on how main NFCS structural elements (pillars) need to be strengthened or put in place in Moldova in order to achieve the GFCS vision, and thus primarily focuses on a user interface, demand-driven products, and the institutional and resource frameworks. In short it suggests that, to advance and implement the NFCS, Moldova needs to:

- engage users by building a solid interface, involving them in NFCS design, understanding and developing their capacities;
- update or develop new products and services that respond to specific users' needs;
- ensure steady and cooperative data flows to feed and sustain these products and services;
- obtain resources and provide mandates sufficient to ensure the effective functioning and sustainability of the NFCS.

The action plan in the Annex presents elements of a road-map of how to get there in the short- and the long-term perspectives. How far and how fast the road is pursued, will depend on both political will and adequate resources.

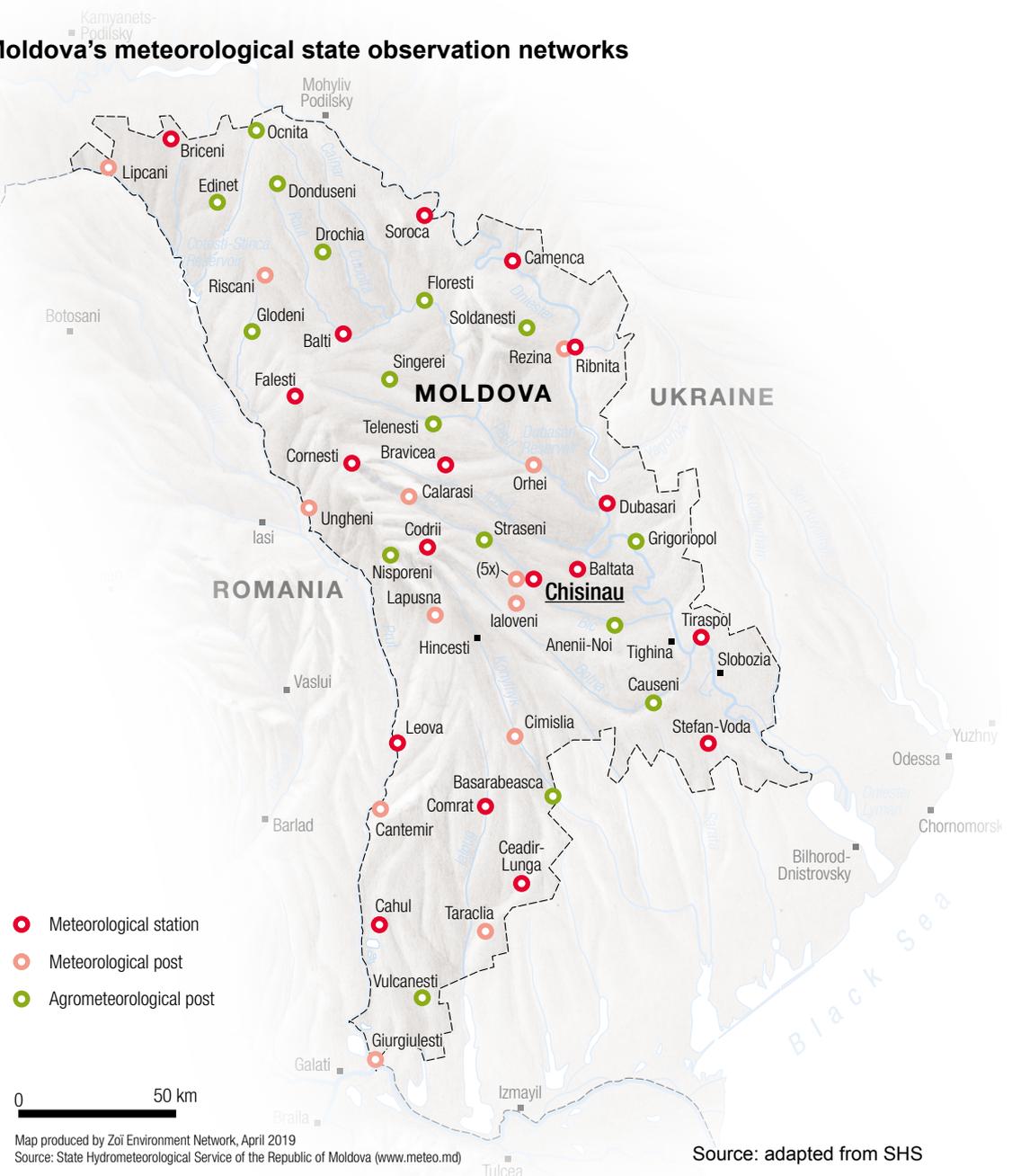
PROVISION AND USE OF CLIMATE SERVICES IN MOLDOVA

STATE HYDROMETEOROLOGICAL SERVICE

Law № 1536 of 02/25/1998 on Hydrometeorological Activities⁵ is the main instrument regulating activities in this area. (The latest changes to some of the law's provisions were made in 2005.) According to the law, the State Hydrometeorological Service of the Republic of Moldova

is the only producer of hydrometeorological data in the country, although such data are also collected and processed by a number of other organisations (Table 2.3).

Figure 2.1 Moldova's meteorological state observation networks



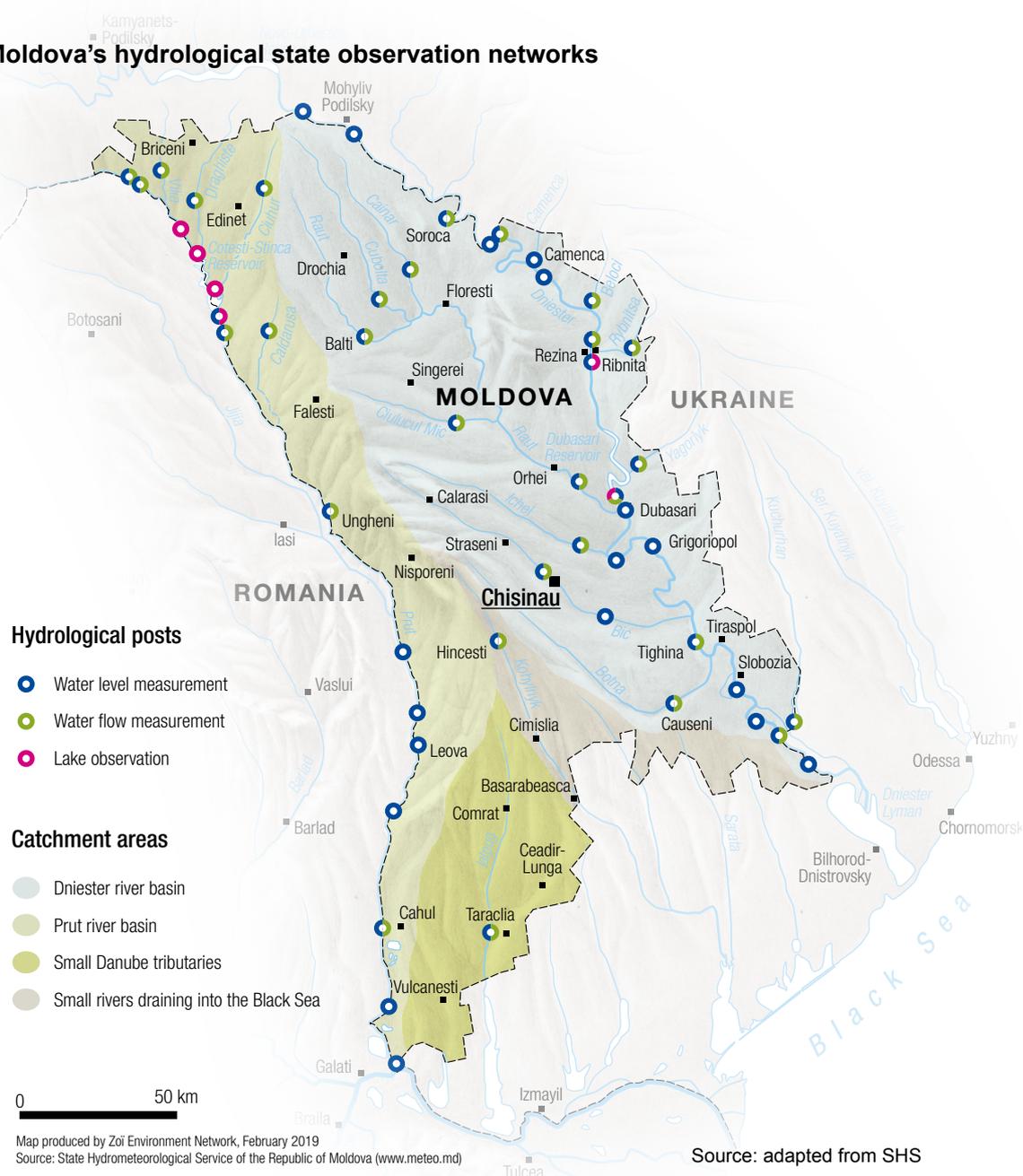
As of 2017, the SHS meteorological observation network included 14 meteorological stations, 15 agrometeorological posts, and 32 mini automatic weather stations with a smaller set of sensors, installed in all regions of the country to increase network density and the quality of customer service. Currently the number of meteorological stations in Moldova (with its surface area of about 34,000 km²) is close to optimal by international standards.

Meteorological observations are performed according to WMO standards and include more than 80 meteorological and hydrological variables

that are measured instrumentally or recorded or determined visually. Together they comprise the content of multi-purpose banks of meteorological data that are used to compile hydrometeorological forecasts, to provide consumers with information about actual weather at observation points, to issue warnings, and to characterise the meteorological regime and climate of particular areas.

Agrometeorological observations are made at 13 of the 14 weather stations and at all 15 of SHS agrometeorological posts. In 2016 the agrometeorological network was upgraded with new Delta-T2 sets to determine soil moisture.

Figure 2.2 Moldova's hydrological state observation networks



The national network of hydrological monitoring of surface water consists of 54 hydrological posts in the basins of the Dniester, the Prut and small tributaries of the Danube and the Black Sea catchments. Thirty river-level measuring posts are automated. The network provides data for hydrological forecasts, for the preparation of hydrological yearbooks, and, jointly with neighbouring countries, for measuring the flow of transboundary rivers.

Table 2.1 summarises the SHS modes of providing information.

The SHS is the sole holder of the National Fund for Hydrometeorological Data, managing the latter according to its own regulations. The Fund, located in the SHS building, is a paper archive (only part of information is stored electronically) which contains data for the whole period of observations in Moldova from the end of the 19th century.

A recent SHS website upgrade as part of an international project for developing of a national programme for adaptation to climate change⁶ makes it possible to improve the presentation of information in a visual form and to provide to users a range of data. At the moment users can obtain forecasts for individual locations (cities), warning maps, and information from observation stations including webcam images (where available). Warnings are displayed using Meteoalarm⁷ protocols, which are also used to provide data through Moldova’s Meteoalarm platform.⁸

Data requested by authorities, other state-owned organisations, enterprises and research bodies (for scientific purposes) are provided for free. On the other hand, the SHS provides paid services to private companies, non-governmental and research organisations, and others implementing project activities, and contributes a portion of the received fees to Moldova’s state budget.

Table 2.1 Information transfer modes of the State Hydrometeorological Service

Target group	Types of messages
Email, telephone messages	
Central and local government Institutions responsible for the prevention of and response to emergency situations Sectoral agencies in agriculture, energy, transport, forestry Construction companies Environmental authorities	Information about possible natural disasters (meteorological, hydrological and agrometeorological forecasts) Reviews of meteorological, agrometeorological, hydrological conditions for the past week, month 10-day information on precipitation and soil moisture
Site meteo.md	
General public	Short-term forecasts (day, week) Warnings (meteorological, hydrological, environmental quality) Selected data from the national observation network Reviews of existing hydrometeorological conditions for a week, decade, month, season, year Information on unusual hydrometeorological phenomena and records In winter, 10-day information about snow depth and the thickness of ice on rivers and reservoirs
Mass media	
General public (via broadcast)	SHS information provided to the media according to contracts (forecast or warnings about adverse or dangerous events (mandatory notification) Interviews on request to all media regardless of contractual arrangements

Source: SHS

Hydrometeorological data are also produced by the Tiraspol Hydrometeorological Centre, which operates 13 gauging posts with manual measurements in the Transnistrian region. Financing for replacing the outdated equipment on the posts with automatic sensors is currently unavailable. The equipment in the Centre's analytical laboratories is also beyond its established service life. All sampling and processing are carried out according to analytical standards of the former USSR. Data are exchanged between the meteorological observation stations in Tiraspol, Ribnita, Dubasari and Camenca through regular communication channels using coded telegrams, and are also transferred to the SHS. The Centre provides information to interested users on request – about 600 per year. The most commonly requests are for forecasts and hydrological and meteorological information, including weather conditions at the time of road accidents or in connection with the loss of, or damage to, crops in order to claim farmer subsidies. State-owned organisations receive information without charge, and private customers pay according to established fees. The recovered fees are transferred to the regional budget, which in turn finances the operations of the Centre.

OTHER PROVIDERS OF DATA AND SERVICES

The Moldovan Air Traffic Services Authority (Moldatsa) monitors weather at the Chisinau airport and, in compliance with the Law on Hydrometeorological Activities, transmits data to the National Hydrometeorological fund. According to the agreement with the SHS, meteorological radar owned by the SHS is installed at the airport on the condition that SHS share the data. Integrating these radar data with Romania's radar observations will improve their use for weather forecasting as well as data visualisation. As the national agency authorised to provide meteorological services in aviation, Moldatsa produces forecasts for air traffic operators.

The Special Service for Weather Modification (the Hail Control Service) and the Ministry of Defence produce forecasts for their purposes, too (the latter to inform the national Air Force).

The Institute of Geography and Ecology of the Academy of Science carries out studies funded from the state budget in four-year cycles. In the last four years research has focused on vulnerability to natural hazards including those caused

by climate change. Local studies have been conducted and a National Atlas of Climate Resources has been released. Meteorological and hydrological data are provided by the SHS and are manually entered into the Institute's database. In addition to state-funded studies, the Institute provides vulnerability and risk assessment for particular areas and settlements – the analysis of flood risk in the Cahul area, for example – on a contract or a project basis. The Institute operates its own research stations, and has access to similar stations of other educational and research organisations such as the Tiraspol State University in Chisinau. Every four years the Institute undergoes accreditation, which is the basis for a new four-year work plan; consequently there is no certainty that the research focus will remain the same for the next planning period.

The Institute of Genetic Studies, Physiology and Plant Protection of the Academy of Science has developed a system of forecasting agricultural plant diseases.⁹ The system utilises historical time series of meteorological observations, and research in plant diseases, and is intended to provide information to farmers about the necessary treatment of crops, the optimal timing of planting and harvesting and other agrotechnological operations. The largest part of the system is accessible by subscription, and a smaller part is in the public domain. For direct interaction with farmers the Institute cooperates with the National Agency for Rural Development (ACSA). Participation in externally funded projects allows the Institute to update and maintain the system.¹⁰

The private Austrian company Pessl Instruments GmbH¹¹ provides services in Moldova by installing small automatic weather stations at farms and providing farmers with individual forecasts of agrometeorological conditions and crop diseases as well as agrotechnical and phytosanitary recommendations. Today about 150 such stations serve more than 300 users in the country (several users can own one meteorological station together). Observation data are transmitted in real time via mobile channels to the Swiss–US company Meteoblue,¹² which is responsible for modelling and forecasting. (The collected data are not transmitted to the SHS.) The forecasts also rely on remote-sensing data. Services are provided on a contractual basis, and 90% of their users are engaged in agriculture. The most in demand are 3- or 4-day

special meteorological forecasts together with recommendations for plant treatment for the same period.

Private energy construction companies in Moldova install wind-power generators equipped with altitude wind-speed sensors. Usually the data collected are not transmitted.

In a survey conducted in the framework of NFCS development (see the Introduction) respondents also pointed out that they obtain weather forecast from freely available online resources, such as:

- Gismeteo.md, Gismeteo.ru, Rp5.ru (Russia);
- Weather.com, Accuweather.com (US);
- Windy.com, Ventusky.com (Czechia).

CLIMATE AND CLIMATE-CHANGE INFORMATION

The SHS is responsible for both studying the country's climate and serving interested organisations with the relevant information. The work entails analysing meteorological observation data and climate trends in Moldova. Standard services include the provision of meteorological data tables and monthly and yearly summaries; the analysis of 10-day, monthly, seasonal and yearly meteorological conditions; the description of observed meteorological phenomena; and the preparation of other information about weather and climate conditions for public authorities, economic entities and individuals. On-request services include the provision of information about meteorological and climate characteristics at any location for any period of time, as well as assessments of wind and solar energy resources and selections of optimum locations for wind and solar power installations. The results of SHS studies and analyses are published in reference books, monographs and Moldova's climate summaries.

The Climate Change Office at the Ministry of Agriculture, Regional Development and the

Environment is the main organisation responsible for international reporting in the context of Moldova's participation in the United Nations Framework Convention on Climate Change (UNFCCC) and other climate commitments. In early 2018, Moldova's Fourth national communication to UNFCCC¹³ included the analysis of climate-change impacts and vulnerability in Moldova's regions. The Office develops national adaptation policy, too. In particular, key sectors such as forestry, health care, and energy began developing sectoral adaptation strategies through the first national project on adaptation to climate change. The second national adaptation project, in collaboration with FAO, will focus on agriculture.

The Climate Change Office uses SHS observation data and, as part of the development of national communications, publishes long-term projections of climate change. Its website¹⁴ presents documents produced by the Office and national communications and other materials sent to the UNFCCC secretariat. The office also runs a portal dedicated to adaptation activities in Moldova,¹⁵ and another portal where it plans to publish key indicators of adaptation measures at the country level.¹⁶

MARDE has received accreditation with the Green Climate Fund. The Climate Change Office coordinates this work, and is adopting a strategic document defining the country's priorities for funding from the GCF. For the purposes of coordinating climate-change related planning and actions, the establishment of an inter-agency National Commission on Climate Change is under discussion.¹⁷

Other organisations working with meteorological data to produce climate-related analyses in their fields include the Institute of Pedology, Agrochemistry and Soil Protection, the National Agency for Food Safety (local plant protection stations), and the National Agency for Public Health under the Ministry of Health, Labour and Social Protection.

STATE AND EVOLUTION OF INSTITUTIONS

Table 2.2 and Figure 2.3 summarise the current state of the collection of hydrometeorological and climate data and the production of information in the interests of various users.

In 2017, Moldova began administrative reforms in order to optimise the operation of state institutions. At the first stage of the reforms, changes were made at the ministerial level, as a result of which the SHS is currently under the Ministry of Agricul-

ture, Regional Development and the Environment.

In 2018, the reform continued at the level of the Ministries' subordinate organisations: for example, the Environmental Agency was established under the auspices of MARDE, which combined control and supervisory functions in environmental quality. The newly created agency is expected to assume SHS functions in monitoring environmental pollution.¹⁸

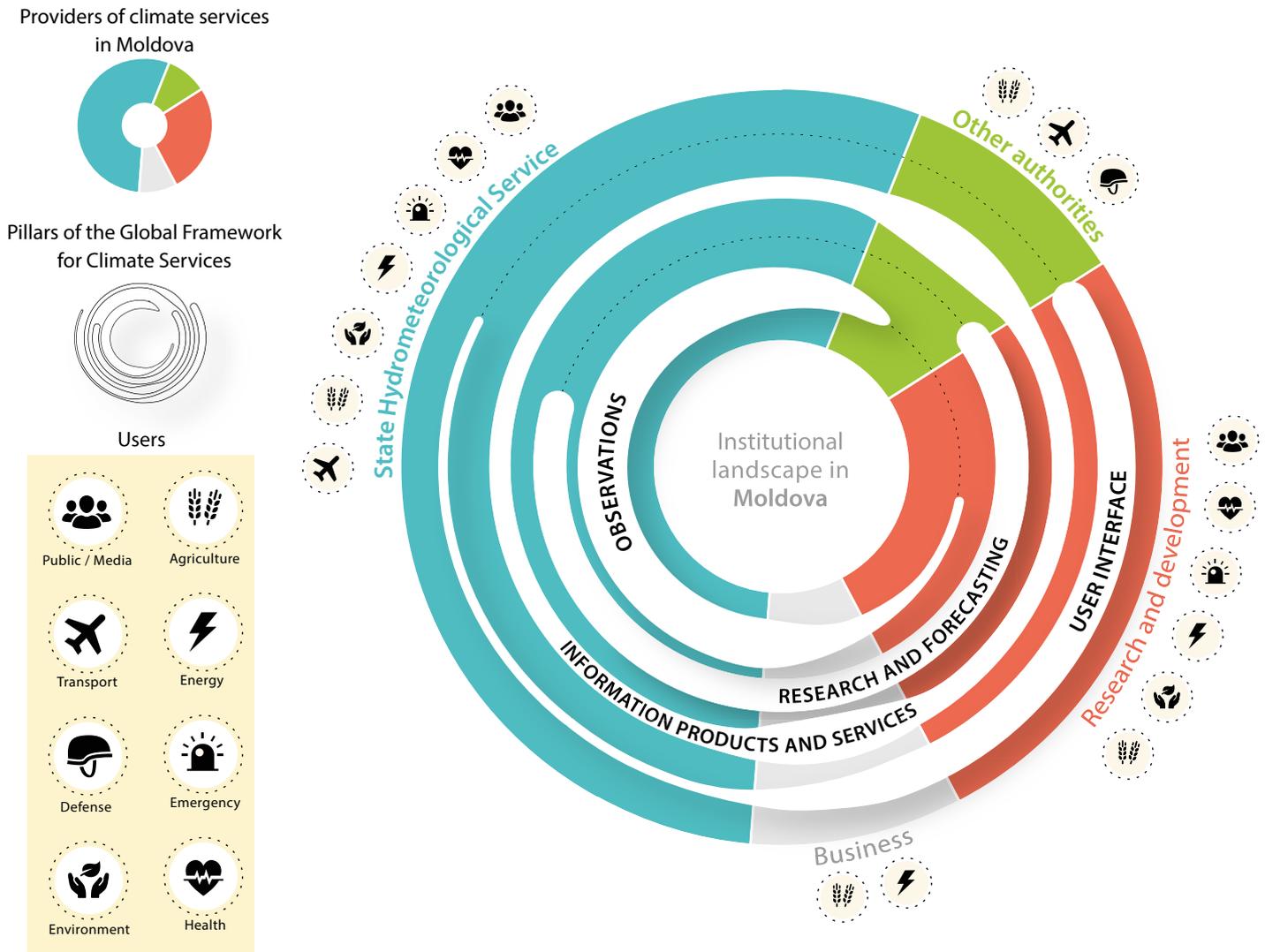
Table 2.2 Hydrometeorological data collection and information products in Moldova

	Observations*	Hydro / meteo	Climate	Sector-specific	General / national	Regional / local	Sectoral
AUTHORITIES							
State Hydrometeorological Service	●	●	●	●	●	●	●
Tiraspol Hydrometeorological Centre	●	●				Transnistrian region	●
Air Traffic Services Authority	●	●		●			✈
Ministry of Defence		●		●			☔
Hail Control Service		●		●			🌾
National Food Security Agency				●			🌾
RESEARCH & DEVELOPMENT							
Climate Change Office			●	●	●		●
Centre of Preventive Healthcare				●			❤
Institute of Geography and Ecology	●			●	●	●	
Institute of Genetic Studies	●			●		●	🌾
Institute of Soil and Agrochemistry				●			🌾
Eco-Tiras			●		●	Dniester river	
BUSINESS							
Pessl Instruments GmbH	●	●		●		●	🌾
Wind-power installations	●					●	
International on-line services		●			🌡		

● Hydrometeorological observations (e. g. GHG emissions, plant response, damage from natural disasters and similar are not considered here)

● Limited / small-scale

Figure 2.3 NFCS-related institutional landscape in Moldova



A serious problem with the production of hydrometeorological and climate information is the difficulty of attracting young professionals to the field. Moldova has no higher education institutions that train professional meteorolo-

gists, hydrologists and climatologists, and resources for vocational training are insufficient. In particular, exchange opportunities with foreign meteorological services are very limited. A related problem is the low pay of SHS staff.

USERS, THEIR NEEDS AND PERCEPTIONS

The uses of meteorological and climate information vary from conducting scientific research to developing and implementing projects – including in construction and environmental pro-

tection – to processing insurance claims.

Table 2.3 summarises the demand for various types of information products.

Table 2.3 User demand for hydrometeorological information products

Type of Information	Sources	Users	Demand
Emergency alerts	SHS	General Inspectorate for Emergency Situations According to service regulations (about 70 public organisations)	Demanded primarily by the government
Daily forecast	SHS	General public through the media General Inspectorate for Emergency Situations Organisations with service contracts	Strong demand, the most popular type of forecast For planning purposes (e.g. for the Hail Control Service, based on radar data)
Short-term (up to 7 days) meteo- and hydrological forecast	SHS	General Inspectorate for Emergency Situations General public through the website and the media	General public For planning in various sectors (agriculture, forestry, energy)
Monthly meteorological forecast	SHS	General public through the website Organisations with service contracts	For planning in various sectors (agriculture, forestry, energy)
Seasonal meteorological forecast	SHS	General public through the website Organisations with service contracts	
Seasonal yield forecast	SHS ACSA	State-owned enterprises Farmers	For agriculture
Long-term climate projections	Climate Change Office	General public through the website Thematic projections for sectors (project-based)	To substantiate projects and sectoral adaptation strategies (health, agriculture, forestry)

Source: NFCS survey results and analysis

The NFCS survey did not provide sufficient insight into various sectors' needs for information with forecast periods longer than two weeks. The majority of responses referred to short-term forecasts from three to seven days (see Table 2.3). Seasonal forecasts for agriculture are in demand too, this being is the only sector for which such forecasts are made.

In the absence in Moldova of a systemic approach to strategic planning,¹⁹ demand for

long-term climate forecasts and projections is weak. Such information is primarily used for individual, research or externally paid projects. Due to the lack of methodology, low user interest and high risks for insurers, climate risk insurance is not developed either.²⁰

Opinions on the quality and accuracy of meteorological forecasts up to 7 days in length range from full satisfaction to the complete opposite. This spread is partly explained by the fact that

lay users – unlike professionals in emergency response and agriculture – rarely pay attention to the source of weather forecasts. Many media outlets rely not on SHS data but on open sources that do not always provide accurate information. The SHS is monitoring the accuracy of its forecasts, but has not yet engaged with information users to explain its results or to compare the quality of its forecasts with those from other sources.²¹

Some users are not aware of the SHS website, and some mistake other websites²² as belonging to the SHS. Particularly in the regions where direct contact with the SHS is not possible, little is known about official information online. This is partly due to the fact that mass media do not always use official weather data, and if they do, they rarely indicate the source of information. On the other hand, users themselves often directly choose sources that are the most convenient to access and use, and that are not necessarily official.

Users also note that many face practical difficulties in obtaining information from the SHS on a paid basis because information about service fees is not easily available,²³ and filing a request often requires a consultation with SHS staff in advance.

A rapid survey conducted with the participants in the NFCS consultation workshop in June 2018²⁴ complements in-depth interviews with information users. Among the 39 respondents were representatives of agriculture, water management and water supply, public health, disaster risk reduction, energy, land management, transport and infrastructure, municipal services and local authorities, hydrometeorology, education, and mass media. The majority of the respondents (85%) represented governmental agencies on the national level.

The respondents confirmed that their main sources of climate-related and hydrometeorological information were the SHS (42%), various

other websites (35%), and TV and radio channels (12%). Less than 1% use mobile applications and other sources. The respondents are satisfied with the quality of the available information, but would like to see information better tailored to their needs, including forecasts with higher precision, localised forecasts, and additional highly customised services (such as information about solar radiation and wind patterns for the needs of alternative energy production). In 57% of the responses users expressed the readiness to pay for services. Those unwilling to pay believe that the costs are the responsibility of the government.

These findings are consistent with the responses to the SHS questionnaire²⁵ of the participants at the 2017 SHS workshop that took place back-to-back with the Meteoalarm workshop in Chisinau.²⁶ Almost 80% of the participants, mostly national-level institutional users, reported that they appreciated the quality of SHS services highly, and that they assessed its forecasts and warnings as credible though not highly credible. The most often used services were 1-day to 7-day forecasts. In almost 80% of the responses, the interaction with the SHS was assessed as good. Users found the data provided by the SHS to be sufficient, and split evenly about how easy it is to understand them. About 70% found SHS information timely and up-to-date, and almost all were satisfied with the way it was presented.

Meanwhile, the recently completed analysis of SHS quality management practices²⁷ noted *inter alia* that SHS approaches to monitoring and analysing customers' information and requirements are not yet clearly defined, and that no methodology is in place to consistently determine, understand and satisfy user needs. The analysis suggested strengthening the SHS engagement of customers and users, and establishing methods for obtaining, monitoring, and analysing information about customer perceptions, e.g. through customer satisfaction questionnaires.

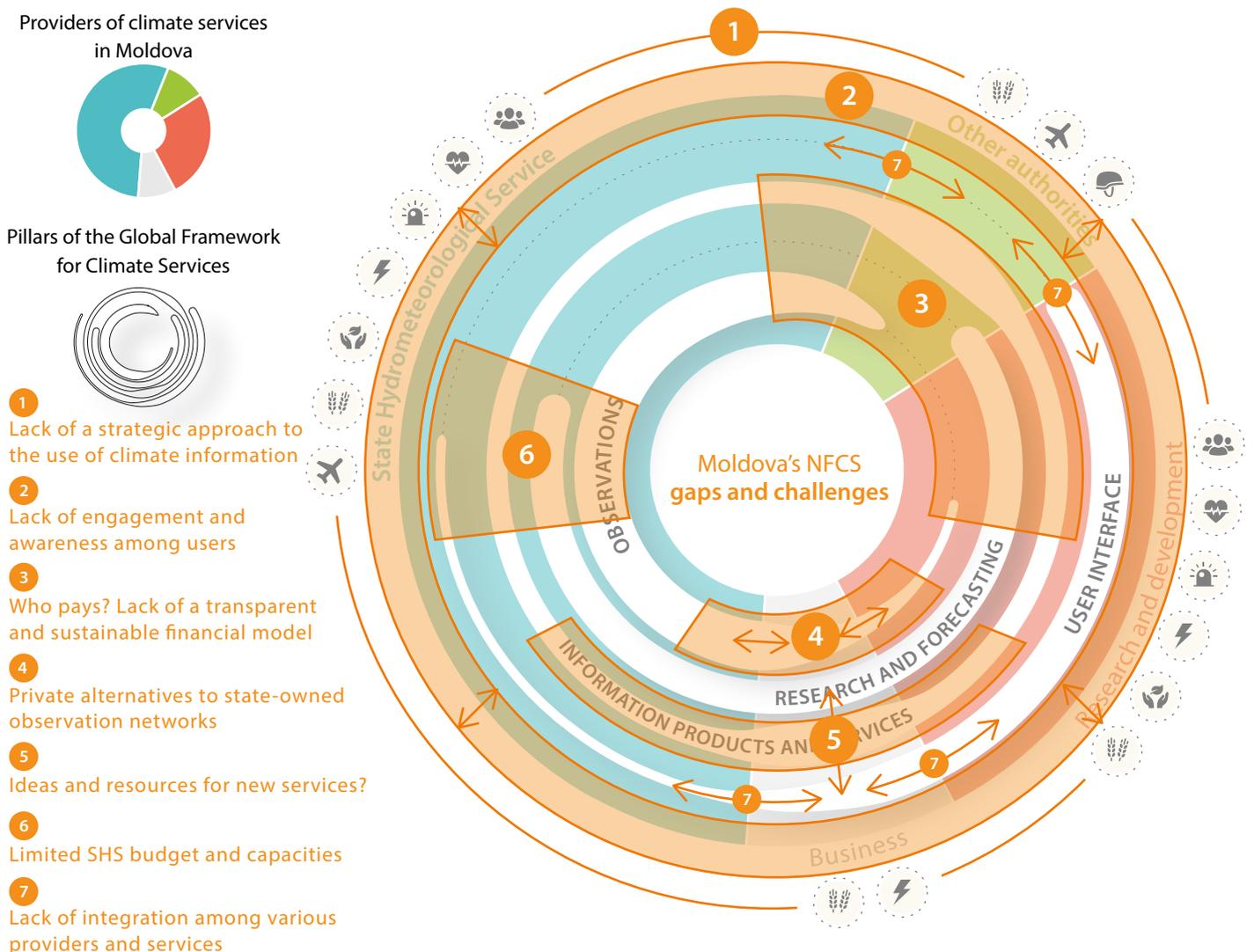
IMPLEMENTATION OF THE NATIONAL FRAMEWORK FOR CLIMATE SERVICES

CHALLENGES AND GAPS

As is seen from the previous chapter, Moldova has a well-functioning system of providing hydrometeorological and climate information to users. However challenges and gaps in the val-

ue chain exist too, and need to be addressed to put in place an effective and efficient National Framework for Climate Services (Figure 3.1).

Figure 3.1 Moldova's NFCS gaps and challenges



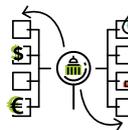
Such challenges and gaps include:

- insufficient user participation in the development of climate products and services, and low awareness of what is available and what may be useful;
- lack of willingness and capacity of a significant proportion of users to pay for climate products and services combined with the severe under-financing of the SHS and its obligation to provide funds to the state budget based on payment for non-core services;
- lack of budget and capacity of SHS to proactively interact with users and the mass media, develop modern analytical systems (e.g. weather and hydrological forecasting) and attract and keep a qualified workforce;
- lack of imagination and experimentation (including much missing legal and economic encouragement) for the development of new climate products and services, e.g., in climate insurance, climate-proofing, extended forecasts, on-demand delivery of data and services, etc.;
- insufficient interaction and integration among the various players in the climate information value chain, complicated by ongoing administrative reform that creates additional uncertainties with respect to the distribution of functions, mandates and related finances;
- the growing abundance of alternative sources of weather information and services, coupled with the lack of clarity and transparency about sources of data in the mass media and online;
- lack of a systemic approach to strategic planning, which partially explains the low demand for information related to long-term climate trends, projections etc. and their likely national, sectoral, regional and individual consequences.

As discussed and developed during the NFCS workshops in June and December 2018,²⁸ the advancement and implementation of the GFCS vision in Moldova will require both cross-cutting actions (such as improved dialogue with users, strengthening governance, sustainability and visibility of the NFCS), and actions involving specific sectors or time scales:



Strengthening the interface and dialogue with, and capacities of, climate information users by bringing them into NFCS design, implementation and oversight;



shaping an effective long-term governance and sustainability model of climate services in Moldova;



expanding and modernizing a line of climate information products to provide seamless services to meet the range of user demands, and building the respective capacities among Moldova's NFCS partners;



building long-term partnerships with priority sectors in Moldova as key recipients of NFCS products and services;



ensuring the visibility of the NFCS to policymakers, mass media and the public at large as a prerequisite for broad public and political support.

Once these current challenges are addressed and the main gaps are closed (see Table 3.1), the set-up in Moldova will meet the GFCS vision of key dynamic structural elements backed by comprehensive capacity-building (Box 1.1).

The following sections provide an overview of the main issues and steps for each of these areas based on the analysis and discussions before, during and following the NFCS consultation and endorsement workshops. The Annex proposes concrete activities to implement these actions, and thus the Framework.

Table 3.1 NFCS actions vs. challenges and gaps

SOLUTIONS CHALLENGES	Bringing in the users	Governance / sustainability	Seamless services	Priority sectors	Ensuring visibility
	Weak integration		•		•
Payment for services	•	•			
SHS budget / capacities		•			•
Innovation / new services	•		•	•	
Private alternatives		•	•		
User engagement	•	•	•	•	•
Strategic approach	•	•			•



BRINGING IN THE USERS

The idea of a mechanism to make climate information users and producers meet, discuss and address their needs on a regular basis received overwhelming support during the NFCS workshops. Participants agreed that the NFCS should establish a permanent dialogue with different types of users in a participatory and interactive manner. Interaction through ‘user interface platforms’ and similar mechanisms is a crucial element of NFCS design, as it allows the reverse engineering of climate products, data and information based on a first-hand understanding of what users really need and want. A comprehensive dialogue is needed with the different groups (from politicians to mass media to individual users) to draw out possibilities for processing, producing and delivering more and better information.

The Moldova NFCS dialogue platform will need to integrate users from various sectors, differ-

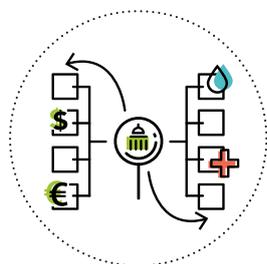
ent backgrounds and levels of capacity – from national authorities to individual farmers. Once established, it will allow for a regular sampling and monitoring of user feedback and collecting inputs for new climate products and services, and will help build capacities of users themselves in order to cultivate further demand. As a practical matter, face-to-face roundtable meetings could be held several times a year, each time focusing on a different set of issues common to a particular user group and/or economic sector. Such a rolling agenda will ensure the continuity of user dialogue and help avoid discussions so broad as to render them uninteresting. In addition to sampling user demand and to helping design new and fine-tune the existing climate information services accordingly (→ see Seamless services), such meetings can also serve as communication tools to promote the potential and results of NFCS (→ see Ensuring NFCS visibility).

Tools for understanding NFCS users and their needs include the active use of market research instruments such as on-line or off-line surveys and focus group studies to collect user feedback. Regular off-line surveys can be outsourced to professional marketing agencies or other specialised organisations, or performed on the margins of face-to-face meetings and on other appropriate occasions.²⁹ On-line tools for monitoring user needs and the impact of information should be integrated into the digital user interface at the SHS and other organisations delivering climate information.³⁰

In the age of e-governance,³¹ users are increasingly accustomed to getting what they are looking for fast and in a straightforward manner. The digital end of the NFCS user platform should be easy to access and use, and should respond to the range of needs – from basic data accessible in a simple form to more comprehensive and detailed information from scientific research. One practical solution here is to continuously invest in developing and modernising the website of the SHS as the leading provider of climate services in Moldova.³² Other modern data-access channels should also

be assessed and activated (such as e.g. SMS / push-messages, mobile applications etc.). An important element in facilitating digital user interface is providing clear and accessible on-line information about the cost of various information products and services as well as about the requirements for obtaining data and information free of charge.

Finally, not all potential users understand the need, value and possibilities of getting specific hydrometeorological and climate-related information, and the full demand for information at various scales is yet to be created within specific user groups. Raising awareness and building capacities of current and potential users about climate-related information and services will help shape the climate service market of the future, contribute to improved business models of providing climate services (→ see Shaping governance and sustainability), and improve the impact of climate information altogether. In particular, users need to understand the nature of meteorological forecasts and their uncertainty, and the advantages of relying on official as opposed to freely available information sources.

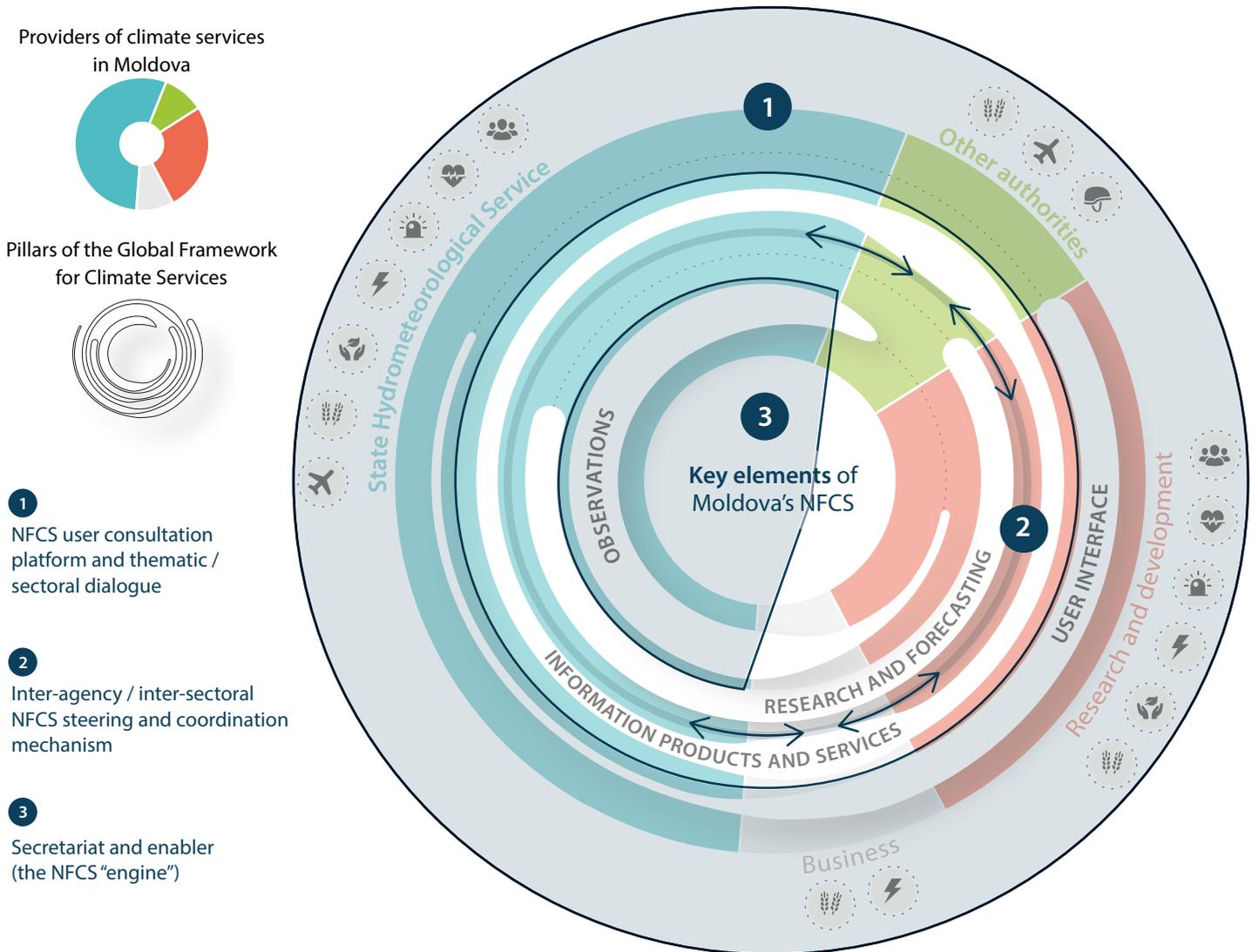


SHAPING GOVERNANCE AND SUSTAINABILITY

In order to serve users along the climate information value chain optimally, a clear structure and governance mechanism of the NFCS will have to ensure that mandates of the various providers of climate services are well aligned and complementary. A place for the framework will need to be found in Moldova's institutional and legal structure, and a mandate and resources established for coordinating functions (Figure 3.2). A transparent and realistic model of financing will need to be established to sustain the services, possibly based on a mix of state funding, user- and case-specific payment for services, and international assistance.

As noted by the participants of the NFCS workshops, a full-fledged discussion of an NFCS governance and sustainability model may be somewhat premature until a permanent dialogue with users has been established (→ see Bringing in the users) and before the results of the ongoing administrative reform are better known (→ see Provision of climate services in Moldova). Yet the SHS is seen as the main responsible body for the coordination and delivery of hydrometeorological and climate-related information. A scaled-up dialogue with users, including those representing interested sectors, may help influence the outcome of the ongoing institutional readjustment.

Figure 3.2 Key elements of Moldova's NFCS



This same dialogue should help shape, and possibly integrate, an NFCS inter-agency and, ideally, inter-sectoral steering and coordination mechanism, whereby the representatives of producers and users of information are mandated to make strategic decisions about NFCS development and to monitor its progress.

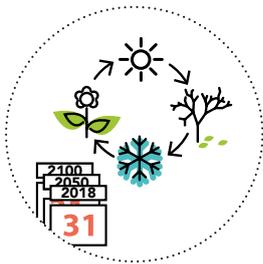
Alternatively, this role could be delegated to an existing inter-agency body, e.g. the Climate Change Commission once, or if, it is established (→ see Provision and use of climate services).³³

Climate information services per se are not defined in Moldova's legislation. This is a gap but also an opportunity to secure the necessary political mandate for NFCS activities, as well as to clarify a number of pending issues that are not covered by legislation currently in force. Among these are:

- the overall coordination role (→ see above) and a clear relationship among the various stakeholders who develop climate information products and deliver climate services;
- remaining uncertainties about the cost of climate-related information services and the financial model for providing them;

- the issues of authorization and data ownership of, and data exchange with, the providers of meteorological data outside of the governmental system (e. g. private operators);
- introducing legal requirements for climate-proofing new infrastructure and sectoral and regional plans and programmes as a tool to introduce climate thinking into strategic decisions and everyday operations.³⁴

The options for legally approving the scope of the NFCS, its structure and implementation, and the necessary clarifications include a governmental document such as an order by the Government or MARDE, or a revision of the Law on Hydrometeorological Activities. The choice goes hand-in-hand with further progress on administrative reform. Supplementary options include introducing NFCS language and provisions in sectoral documents such as the forthcoming concept of the national integrated environmental information system.³⁵



PROVIDING SEAMLESS SERVICES

Different users need different scales of climate information: from nowcasting and short-term forecasting for emergency response (which are usually direct SHS responsibility), to seasonal forecasts for agriculture, to multi-year projections of climate change for long-term planning that can involve other players and organisations.

Ideally, by understanding what users in Moldova want, who and how is able and willing to supply information at the required time scales, and how to build optimal interactions among them (→ see Shaping governance and sustainability), information providers together should be able to deliver a seamless range of services matching these various demands. The key questions are:

- What is needed?³⁷
- Can the needs be met, and what are the impli-

Legal and institutional changes need to be accompanied by a realistic model of financial sustainability. Not having access to sufficient financial resources, the SHS is currently under pressure to earn additional income. At the same time, a significant percentage of users is not pleased that raw data are not always openly accessible, while others demand specific products that currently are not produced and would require additional funding. These potential new products and services offers business opportunities for which users may be willing to cover development and production costs (→ see Seamless services and Priority sectors). Both the NFCS and the SHS need a realistic business model and business plan based on the combination of allocated state funding, international assistance, and a transparent mechanism of payment for services.³⁶ The improved legal and normative base should codify this model and help ensure both the financial sustainability of climate services and the legally binding responsibilities for providing them.

cations in terms of production and resources?

- Who in Moldova can provide the products and services needed, and how can the country create the optimal structure for that?

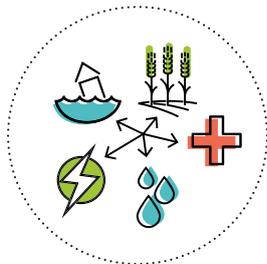
A systematic user dialogue (→ see Bringing in the users) will build up the understanding of specific user needs, and will help answer the first question and come up with ideas of innovative products and services.

Growing demand and improvements in analytical and research methodology are likely to lead to data products becoming more complex. This will increasingly put stress on the technical capacities of Moldova's organisations³⁸ – both tools and qualified labour. The lack of qualified specialists entering Moldova's hydrometeorological job market was a major concern during the NFCS consultations.

In terms of localised products, expanded capacities may also be needed to level out regional differences, e.g. by bringing up to the level of the rest of the country the observation network and data exchange capacities in the Transnistrian region.

Finally, more specific requested products and services require more focused sectoral exper-

tise: explaining how high temperatures may influence specific plant species, or the use of advanced research and modelling techniques may require cooperation with other partners. The SHS can provide weather forecasts, but a further analysis of impacts and relationships should increasingly rely on sector-specific information as well as cooperation with the respective experts and organisations (→ see Priority sectors).



ADDRESSING PRIORITY SECTORS

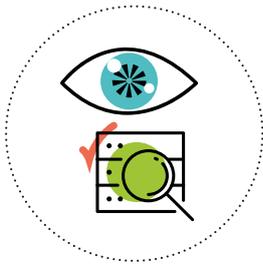
The GFCS focuses on five sectors that are key beneficiaries of climate services worldwide: agriculture and food security, disaster risk reduction, energy, water and health. As was agreed during the NFCS consultations, all these sectors are highly relevant in Moldova. Additional suggested NFCS sectors include forestry (which can be seen as an extension of agriculture), biodiversity, and transport and its infrastructure. The current challenges are to reach agreements on which of the sectors have the highest demand for climate information, products and services; and on which offer immediate opportunities to develop new services through synergies and complementarity among the various players, and can contribute financial, human and other resources to developing and implementing the new services.

One obvious choice is agriculture, where several players now serve national and regional users (cf. Table 2.3) by providing long-term climate analysis and projections; regional and local seasonal agrometeorological forecasts; real-time, highly localised meteorological data; and phenological, pest and disease forecasts with specific plant-protection guidance and agrotechnological recommendations. Integrating these flows in a synergetic manner to provide the variety of agricultural users with the best possible services while building cooperation, synergies and financial sustainability among data and service providers, can make a strong case for developing the NCFS.

Other sectors that may be ready and willing recipients of new customised climate services are health (e.g. correlation between climate change and diseases), alternative energy (e.g. support to developing and operating wind-power installations), and disaster risk reduction. For the latter, a comprehensive cross-sectoral risk analysis would be important in order to customise and fine-tune climate-related information products and improve their use in decision-making. Hydro-power offers interesting opportunities for working at the cross-border level with neighbouring Romania and Ukraine, where the demand exists for facilitating the transboundary flow of real-time and other hydrological information.

Less straightforward longer-term sectoral opportunities may include climate-proofing newly built infrastructure. Existing building codes and regulations could be revised to require the consideration of climate change as an integral part of construction planning and design.³⁹ Needs and opportunities for climate information services in the insurance industry can be discussed in the context of Moldova's practices of dealing with weather-related damage and the experience of other countries.⁴⁰

To identify needs, priorities and possibilities in each sector, a regular dialogue should be established both through direct contacts with key organisations in each of the target sectors and on regular consultations with users (→ see Bringing in the users and Seamless services). Stronger intersectoral cooperation can improve existing data flows.



ENSURING VISIBILITY

Decision makers and mass media are among the key target groups for NFCS communication activities. Decision makers at all levels should be clearly informed about the benefits and the needs of climate-related information services, and about how to address and support them. Continuously explaining the benefits of climate services and maintaining their visibility vis-à-vis those making political, legislative or financial decisions is crucially important for the Framework's sustainability.

To the extent possible, decision makers should be directly integrated into user-focused NFCS activities as well as into its governance mechanism (→ see Bringing in the users and Governance and sustainability). However, in reality this will offer only limited opportunities to engage with some of them face-to-face and on a regular basis, while reaching others will require targeted information campaigns, anchored in an evidence-based approach. The purpose of this approach is to demonstrate the added (i.a. economic or monetary) value of different types of climate information and its potential through practical examples of preventing or reducing damage or providing benefits. To ensure a sufficient evidence base, it may be helpful to organise an all-encompassing study of economic and other benefits of NFCS in Moldova,⁴¹ to systematically monitor the use of climate services and user feedback, and to nurture the successful cases.

The general public does not often make full use of the available climate information not because people do not like it or it does not correspond to

people's needs, but simply because they may not know what exists (→ see Provision and use of climate services). For instance, a large proportion of potential users in Moldova believe that the SHS provides only forecasts, and are unaware of its information on TV, radio and its website where a wealth of additional data and services are available. Mass media are an important user of NFCS services themselves, but are also an important channel to engage politicians and the general public. Regular networking with the media (Box 3.1), building contractual relations with media companies and stronger legal accountability for information on both sides may improve the efficiency of broadcasting not only of climate information, but also of knowledge about the NFCS as a reliable national framework to produce and access it. Reaching out to Moldova's population through social media, and targeted work through blogosphere opinion leaders may be extremely productive in raising NFCS visibility.

All in all the NFCS needs a comprehensive and systematic communication strategy backed by adequate finances and capacities among NFCS partners.⁴² The strategy should look at addressing various target audiences through appropriate communication channels, from regular communication via mass media to direct promotional activities and events at the national and the local levels, to targeted publication of information bulletins, fact sheets, videos etc. online and offline and daily work for maintaining trusted relations with the communication channels.

Develop capacities of key SHS personnel in media communications, and create a new communications and media relations position within the SHS.

Develop an SHS communication and awareness-raising strategy to guide all communication activities conducted by the SHS, and develop an implementation plan that is adjusted annually.

Consider low-cost adjustments to online communications by the SHS:

- open at least one social media account (most national hydrometeorological services in the EU are active on Facebook and Twitter, platforms that can be the primary choices);
- prepare monthly information bulletins for the media and the public;
- publish fact sheets about available services and prices for potential users.

Strive to further develop networking relations between the SHS and national hydrometeorological services of other countries, and organise study visits and internships with the use of European and other international funds.

Encourage and oblige mass media to always indicate the source of hydrometeorological information they publish or broadcast.

Source: summary by Tanja Cegnar (Slovenian Environment Agency) of the outcome of the SHS–mass media roundtable back-to-back with the NFCS consultation workshop in June 2018 (Zoř Environment Network 2018)

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Zoï Environment Network. Report of the national endorsement workshop on the National Framework for Climate Services in the Republic of Moldova. Geneva, 2019.

Also consulted were draft or final National Frameworks for Climate Services and / or the respective action plans⁴³ of Burkina Faso, Chad, Côte d'Ivoire, Madagascar, Mali, Niger, South Africa, Senegal, Tanzania and Vanuatu as well as information related to NFCS plans and activities in China,⁴⁴ Germany,⁴⁵ Switzerland⁴⁶ and the UK.⁴⁷

ENDNOTES

- 1 <https://www.wmo.int/gfcs/>
- 2 For the purpose of the discussion in Moldova's and in the spirit of 'seamless' information space, in this particular context 'climate services' have included the provision of any weather and hydrological data, information and analytical products for their delivery across the value chain. For this reason the notions of climate (as opposed to climate-change) and hydrometeorological information are used in this document interchangeably.
- 3 Zoï Environment Network 2018
- 4 Zoï Environment Network 2019
- 5 <http://lex.justice.md/viewdoc.php?action=view&view=doc&id=311612&lang=1>
- 6 <https://undp-adaptation.exposure.co/improving-meteorological-services-in-moldova>
- 7 <http://www.meteoalarm.eu/>
- 8 http://www.meteoalarm.eu/en_UK/0/0/MD-Moldova.html
- 9 www.eco-con.net
- 10 For example, a joint project with Ukraine on plant pests: <http://eaptc.eu/en/awarded-grant-projects-md-ua/view-strengthening-regional-capacities-for-applying-environmentally-friendly-technologies-in-integrated-pest-management-systems.html>.
- 11 www.pesslinstruments.com
- 12 www.meteoblue.com
- 13 Available in English and Romanian on clima.md.
- 14 clima.md
- 15 adapt-clima.md
- 16 portal.clima.md
- 17 <http://particip.gov.md/proiectview.php?l=ro&idd=5114>
- 18 <http://lex.justice.md/viewdoc.php?action=view&view=doc&id=375961&lang=1>
- 19 Among long-term commitments and strategies in operation today are the 'Moldova 2030' programme, UN Sustainable Development Goals (for which specific national targets have been set), the National Strategy for Adaptation to Climate Change, as well as Moldova's Nationally Determined Contribution to solving global climate challenges.
- 20 Only few companies in Moldova provide weather insurance (e.g. for damage from hail or frost). Usually, in case of weather emergencies, farmers prefer to directly claim damage subsidies from the state.
- 21 In fact, the SHS does not employ specialists in public or media relations who could partially mitigate these problems. Such tasks are performed on an ad hoc basis by employees from substantive divisions, who are not able to systematically work with users. Currently the SHS participates in a project to standardise and improve its quality management, within which some of user-focused internal processes will be developed.
- 22 E.g., gismeteo.md
- 23 For instance, only being available on the old version of the SHS web site http://old.meteo.md/preț_rum.rtf.
- 24 Zoï Environment Network 2018
- 25 Serviciul Hidrometeorologic de Stat 2017
- 26 <http://www.meteo.md/index.php/ro/news/detail/serviciul-hidrometeorologic-de-stat-din-republica-moldova-a-celebrat-aderar>

- 27 JBA Consulting 2018
- 28 Zoï Environment Network 2018, 2019
- 29 Similarly to how it was done by the SHS itself back-to-back with the Metealarm meeting in November 2017
- 30 As, for instance, has been recommended in the context of SHS quality management analysis (JBA Consulting 2018)
- 31 Which is rather advanced in Moldova, see e.g. <http://www.egov.md/>
- 32 Already much improved recently thanks to recent support from Zentralanstalt für Meteorologie und Geodynamik in the frame of the UNDP-ADA adaptation project
- 33 The advantages of linking the NFCS to such an existing policy body are obvious, but the disadvantage may be that climate change only partially covers the content of climate services as they are understood within the GFCS and this process.
- 34 As is increasingly done for new investments in Europe and worldwide (see e.g. GIZ 2011)
- 35 United Nations Development Programme 2018
- 36 Among the suggestions at the NFCS consultation workshop was the following scheme (Zoï Environment Network 2018): the SHS or another responsible body should provide information to state actors and programmes at no cost, and to private enterprises on a sliding scale related to their incomes and their uses of the information (methodology to be elaborated). Payments by scientific institutions and NGOs would be at cost if the user has external funding, and at no cost for research, unpaid analytical work, etc.
- 37 For instance, are medium-term forecasts detailed enough as a basis for decision-making, or do they need to be tailored to specific needs so that people are able to better use the information?
- 38 For instance, it has been acknowledged that forecasting capacities of the SHS may need to be upgraded to facilitate easier preparation of modern products (JBA Consulting 2018; Finnish Meteorological Institute 2014).
- 39 To this end, building codes and regulations could be strengthened with provisions for climate-proofing of new construction projects, with a potential role for the SHS to play in providing information, advice and assessment of compliance.
- 40 See e.g. <https://www.worldbank.org/en/results/2017/12/01/climate-insurance>. In 2013–2014 the Strategic framework for adaptation to climate change in the Dniester River basin identified expanding climate insurance as a promising adaptation measure in Moldova and Ukraine (UNECE, OSCE 2015).
- 41 In 2008 the World Bank estimated that improving targeted delivery of climate information, including the development of user-focused products and services, can provide Moldova more than €70 million in benefits over ten years (World Bank et al. 2008). Imminent climate change will raise this amount. This was one reason for continued international support in this field over the last decade, including the current support to the conceptualisation and establishment of a National Framework for Climate Services.
- 42 But to start with, at the SHS itself, cf. box 3.1.
- 43 <http://www.wmo.int/gfcs/national-action-plans>
- 44 <https://www.sciencedirect.com/science/article/pii/S2405880716300577>
- 45 <https://public.wmo.int/en/resources/bulletin/implementing-gfcs-swiss-and-german-national-showcases>
- 46 Ibid; <https://www.meteoswiss.admin.ch/home/research-and-cooperation/nccs.html>
- 47 <https://www.metoffice.gov.uk/services/climate-services/climate-service-uk>

ANNEX 1

Action Plan on the establishment and implementation of NFCS in the Republic of Moldova

No	Activity	Time frame, years	Funding sources
Objective 1			
Establish the NCFS institutional set-up and ensure the sustainability of its implementation			
1.	Identify NFCS institutional arrangements and responsibilities on the national level, including steering and coordination mechanisms under the SHS leadership	1-3 years	National budget External support
2.	Adjust the SHS organizational structure and functions to realize the coordination and leadership tasks in the implementation of climate services	1-5 years	SHS budget
3.	Develop a sustainable NFCS–SHS business model and a long-term strategy for its implementation, and modify the relevant legislation	1-3 years	National budget External support
4.	Review Government decision № 330 from 03.04.2006 (the list of services provided free of charge and with payment by the SHS) and update the list of services and prices to be provided in the NFCS framework	1-3 years	National budget External support
Objective 2			
Ensure the involvement of users in the development of climate services			
5.	Assess users' demand, feedback and satisfaction with the climate services (surveys, focus groups, user feedback management at SHS, round-table sectoral meetings)	Annually	National budget
6.	Improve the web interface and further develop one-stop portal services and new communication channels of the SHS (sms / push, mobile phone applications, etc.)	2-4 years	National budget External support
7.	Develop a directory of experts and organizations that provide information in the field of climate services	1-3 years	National budget External support
Objective 3			
Provide users with continuous and seamless climate services			
8.	Improve observation networks, forecasting capacities and technologies of SHS and other NFCS partners	3-5 years	External support
9.	Create the institutional and operational instruments for the integration and interoperability of data exchange with existing observation networks as an integral part of NFCS	1-5 years	National budget External support
10.	Apply modern IT tools for archiving data from the national data fund which are relevant for climate services	1-3 years	National budget External support
11.	Develop and launch new climate information products for the general public, businesses and public institutions	1-5 years	National budget External support
12.	Restore or introduce university-level education in the areas relevant to climate services in Moldova	3-5 years	National budget External support
13.	Organise the training of young professionals through international exchange and internships to raise their capacities in the implementation of climate services	1-5 years	National budget External support
Objective 4			
Address priority sectors through climate services			
14.	Conduct needs assessment for providing climate services in the long term in line with international standards, addressing various sectors of the national economy	1-5 years	National budget External support
15.	Develop targeted climate services for priority sectors	1-3 years	National budget External support
16.	Develop guidelines for incorporating climate information and perspectives into sectoral and regional development planning	1-3 years	National budget External support
Objective 5			
Ensure the visibility of NFCS implementation			
17.	Develop and implement an NFCS communication strategy for different target audiences through various communication channels	1-5 years	National budget

ANNEX 2

Broader action areas endorsed by NFCS stakeholders

ACTIONS	Cost *	Time frame, years		Funding sources		
		1 – 2	3 – 5	SHS	Other domestic	Interna- tional
BRINGING IN THE USERS						
Arrange regular meetings or round tables with users with sector-focused rolling agenda	€	•	•	•		
Establish a directory of experts in climate information services and their areas of competence for addressing user inquiries	€	•		•		
Carry out systematic surveys and focus groups to assess user demand and feedback	€	•	•	•		
Integrate user feedback management in SHS (and other NFCS partners') web-sites	€	•		•		•
Further modernise web and one-stop portal services, and develop new communication channels (SMS or push messages, mobile phone applications, etc.)	€€		•	•	•	•
Provide online and regularly review transparent information about cost and access rules for data and services	€	•		•	•	
Build users' capacities to understand climate and hydrometeorological information (i.a. use TV, other media, publicity, improved presentation of forecasts, education)	€€		•	•		•
SHAPING GOVERNANCE AND SUSTAINABILITY						
Discuss NFCS institutional arrangements and responsibilities as part of user dialogue	€	•		•		
Evaluate options for NFCS steering and coordination mechanisms, i.a. evaluating and using existing experience from other countries	€	•		•		•
Evaluate solutions for institutionalising NFCS (revised laws, cabinet and MARDE orders, etc.)	€	•		•		
Provide support to drafting NFCS-related legislation and inputs to other relevant documents (i.a. via an inter-agency and intersectoral working group)	€€	•	•	•		•
Develop sustainable NFCS–SHS financial sustainability model and a long-term strategy for its implementation	€€	•		•		•
PROVIDING SEAMLESS SERVICES						
Evaluate user satisfaction with current climate services and develop new product and service ideas at different time and spatial scales	€	•	•	•		

Modernise and develop forecasting capacities and technologies of the SHS and other NFCS partners	€€		•			•
Close gaps in regional observation networks (e. g. in the Transnistrian region)	€€		•			•
Develop arrangements for integration and inter-operability of, and data exchange with, various existing observation networks (common e-register and e-map, agreements, licensing)	€	•	•	•	•	•
Ensure full electronic archiving of past observation data	€€	•		•	•	•
Develop popular climate-information products for the general public (cf. WMO Atlas of Health and Climate)	€	•		•	•	
Restore university-level hydrometeorological and climate education in Moldova and foreign exchange for young professionals	€€		•	•	•	•

ADDRESSING PRIORITY SECTORS

Agree on priority sectors and information services (products) to be developed for them	€	•		•		
For a few selected NFCS sectors, develop integrated solutions climate services across the value chain and the range of providers	€€	•	•	•		
Investigate new longer-term service opportunities and needs for revised legislation with climate and natural disaster insurance, climate-proofing of new construction, etc.	€€		•	•	•	•
Develop guidelines for incorporating climate information and perspectives into sectoral and regional development planning	€	•			•	•

ENSURING VISIBILITY TO DECISION MAKERS

Collect, study and communicate to policymakers economic and non-economic benefits of the NFCS and its set-up	€€	•		•		•
Continue systematic dialogue and targeted cooperation with mass (and other) media	€	•	•	•		
Develop and institutionalise SHS (and other NFCS partners') capacities for media and public relations	€€	•			•	
Study the best communication and public relations strategies and techniques from the WMO and its member countries	€	•	•	•	•	•
Establish local climate information centres and facilities in selected interested regions of Moldova	€€		•	•	•	•
Develop and implement a comprehensive NFCS communication strategy for different target audiences and communication channels	€€	•	•	•	•	•

* € – low budget requirements, €€ – moderate to significant budget requirements

