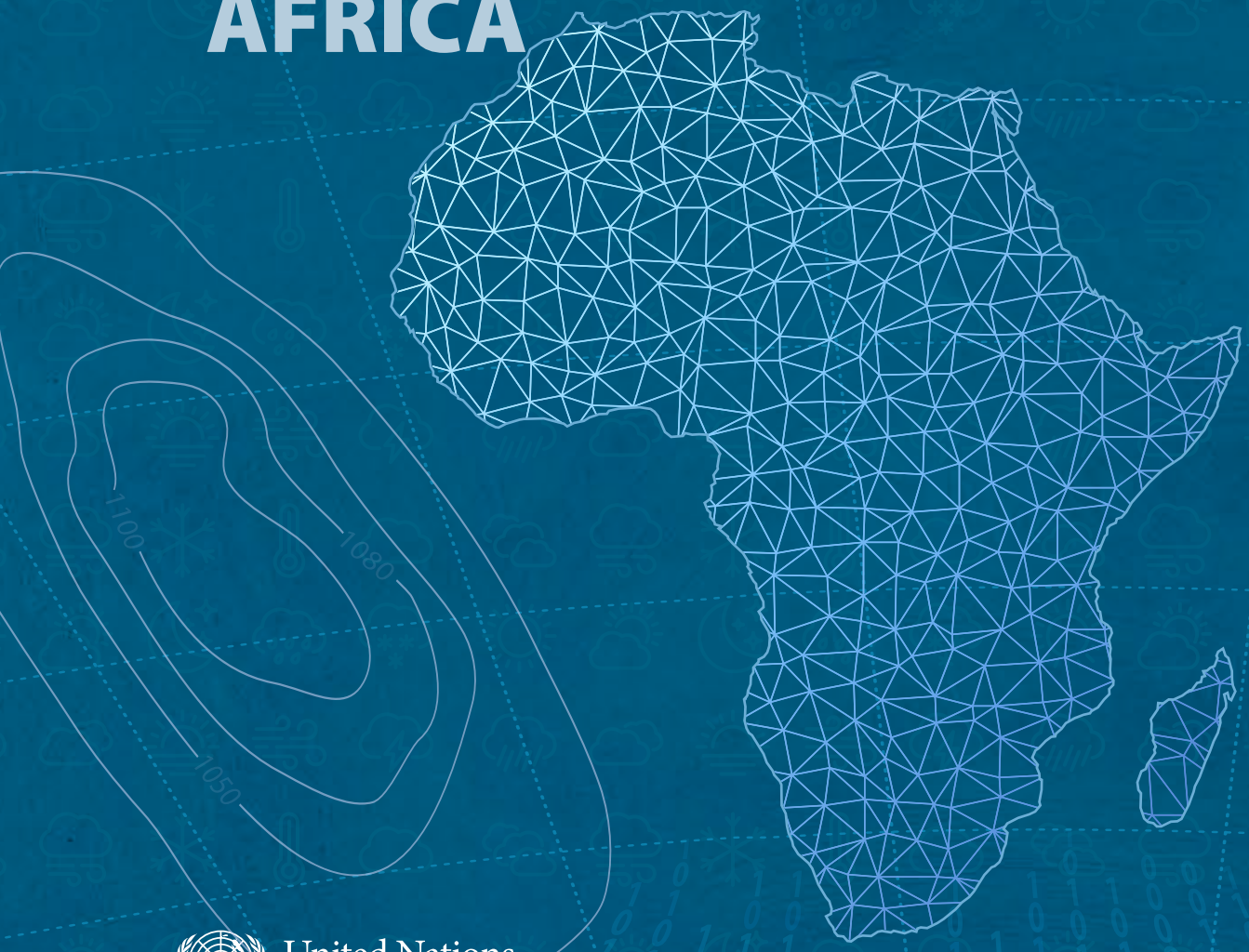
UTILIZATION OF WORLD METEOROLOGICAL ORGANIZATION MANDATED DATA SHARING PROTOCOLS IN AFRICA



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Contents

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Executive summary

In the present report a review is set out of the World Meteorological Organization (WMO) resolution 40 (Cg-XII) on WMO policy and practice for the exchange of meteorological and related data and products including guidelines on relationships in commercial meteorological activities. The particular focus is the implementation of resolution 40 in Africa with a view to supporting the development of climate information services and promoting sustainable climate change adaptation and resilient development. In application of resolution 40, WMO Member States share "essential" data and products with one another and with research and educational institutions on a "free and unrestricted" basis. However, Member States may impose conditions before sharing "additional" data and may allow private sector stakeholders to impose charges for those services. In that regard, the Intergovernmental Authority on Development Climate Prediction and Applications Centre (ICPAC) launched a data sharing policy in collaboration with the national meteorological and hydrological services in countries in the Horn of Africa, while the Regional Training Centre for Agrometeorology and Operational Hydrology and their Applications (AGRHYMET), the Southern African Development Community Climate Service Centre (SADC-CSC) and the Climate Application and Prediction Centre of Central Africa (CAPC-AC) have launched or are launching similar policies in West, Southern and Central Africa, respectively. WMO is also collaborating to that end with national meteorological and hydrological services in North Africa.

This report highlights a number of best practices at continental, regional and national levels. At the continental level, WMO runs a data management facility known as the WMO Information System (WIS), which collects and disseminates weather and climate data through the WMO Global Telecommunication System. All data from African national meteorological and hydrological services and other data collection or production centres are gathered at a continental data hub in Casablanca, Morocco, for global redistribution and exchange. At the regional level, best practices include the convening of regional climate outlook forums and the establishment of regional centre data repositories. At regional climate outlook forums, all WMO Member States share their data, tools and methodologies, strive to reach a climate information consensus for the next rainy season, identify impacts and implications of climate events, formulate climate event response strategies and widely disseminate research outcomes. Regional centre data repositories collate data provided by national meteorological and hydrological services, which are further quality controlled and processed to generate tools and products. The enhanced data and products are shared with WMO Member States to support climate-related initiatives.

At the national level, most meteorological and hydrological services maintain good relationships with universities, research scientists and the private sector. Requested data are, in most cases, supplied provided that certain conditions are met. A recently developed best practice is the involvement of national meteorological and hydrological services in research and service projects. This promotes the exchange of data and products among all relevant stakeholders. Furthermore, many African countries are strengthening their political and institutional coordination to streamline processes for drawing up national plans for disaster risk management, strengthen data and information generation and oversight and promote collaboration among national and technical institutions, private sector companies and other relevant data users.

A number of barriers continue to impede efficient data sharing in Africa. These include the voluntary nature of WMO resolution 40, in which the twelfth WMO Congress recognized the right of Member States to choose the extent to which they make meteorological and related data and products available, both domestically and to stakeholders abroad. Furthermore, certain users have been known

to make inappropriate use of climate data, which had discouraged many national meteorological and hydrological services from disseminating those data. National legislation may also restrict access to meteorological and related data, including on grounds of national security. Finally, governments often lack a clear understanding of the value of data sharing and tend to consider meteorological and related data as commodities for which fees can be charged to offset the costs of meteorological infrastructure and equipment.

At the operational level, many data providers lack sufficient human and technical resources, while public scrutiny or criticism of their data can make them reluctant to share data with relevant stakeholders. In addition, data discovery and access is a key operational barrier. In fact, it is often difficult to determine whether relevant data have been gathered for specific regions because most data are still not published online. Moreover, the procedures that must be followed to access data are often far from clear, while the failure of data generating authorities to agree on a standardized format for data collection and dissemination impedes system interoperability and data sharing within regions. WMO has, however, taken action to address those challenges, including by establishing WIS and promoting the use of a standard computer software suite for the storage and management of climatic data.

In the light of the above, the report includes a number of recommendations. These include the amendment of WMO resolution 40, the extension of WIS to cover all data providers, closer collaboration among data providers and users through the adoption of a "win-win" business approach, the harmonization of technical procedures for data discovery and access, and the convening of data monitoring meetings in all African subregions. In particular, efforts must be made to enhance coordination among and strengthen the role of WMO Regional Climate Centres, in collaboration with the African Climate Policy Centre (ACPC). Finally, it is proposed that a data sharing authority should be established within an operational institution with a continental mandate. Potential institutions include ACPC, the African Centre of Meteorological Applications for Development (ACMAD) and the WMO Regional Office for Africa. The authority, which should be governed by a board consisting of heads of African States or relevant ministries, should seek to mobilize public support for open access to meteorological data in Africa and develop policies, regulations and guidelines to promote data sharing. The board of the authority would also seek to mobilize long-term donor support and secure funds to support countries' equipment maintenance and data collection needs. On a daily basis, the board could oversee data exchange activities, provide clearance for all research and or/service projects in Africa, and resolve complaints submitted by members on the basis of legally sanctioned modalities.

1. Introduction

1.1. SETTING THE SCENE: CLIMATE INFORMATION SERVICES

Climate change constitutes a serious threat to many development sectors in Africa, including, in particular, the agricultural, water and energy sectors (Intergovernmental Panel on Climate Change, 2014; Sylla and others, 2016; Economic Commission for Africa, 2017). To address the adverse effects of a changing climate, the development and implementation of adaptation strategies have become a crucial process on the continent. Adaptation can be incremental, when coping with current climate variability, or transformational, when taking action to address anticipated severe climate change impacts in the future (Howden, Crimp and Nelson, 2012). While the latter builds on long-term climate change projections, the former requires day-by-day or season-by-season information.

Climate information services, which involve the generation, packaging and delivery of weather and climate data and their subsequent uptake by users, are rapidly expanding in Africa and are being used to support climate adaptation measures and resilient development (Kadi and others, 2011). Climate information services can describe historical, current and future weather and climate conditions and can include future predictions on daily, monthly, seasonal or decadal timescales and projections at multidecadal and centennial scales (WMO, 2014a). Climate information services also takes into account the impact of weather and climate conditions on natural and human systems. Traditional climate information service providers in Africa include national meteorological and hydrological services, whose activities are supported by a network of weather stations taking measurements of, among other parameters, precipitation and temperature, with guidance provided by WMO. Climate information service providers also include national institutes, regional research centres and consultancy firms, national associations, insurance companies and private sector stakeholders.

1.2. THE IMPORTANCE OF DATA SHARING IN SUPPORT OF CLIMATE INFORMATION SERVICES

Climate information service providers do not necessarily generate their own weather and climate data. Indeed, they may make use of available data from other providers and use their specialist knowledge and expertise to generate the information needed by specific users (Feinstein and Llovet, 2014). The data needed to monitor and predict weather and climate patterns and to generate climate information