Food and Agriculture Organization of the United Nations

Guidelines on institutional coordination for **drought management**

Global Water Partnership

INTEGRATED DROUGHT MANAGEMENT PROGRAMME

WORLD METEOROLOGICAL ORGANIZATION

Guidelines on institutional coordination for **drought management**

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Foreword

Drought has direct or indirect impacts on all aspects of society, the environment and the economy. This multifaceted nature has implications for managing drought events, particularly in coordinating mitigation efforts. The composition of institutional coordination mechanisms plays a decisive role in the efficiency and effectiveness of management. Even proactive actions can fall short of expectations if the coordination mechanisms are not adequately designed to deliver them. With the intensification of drought events and the multitude of mitigation actions, it becomes increasingly important to establish institutional coordination as part of the planning process of drought management.

The selection or creation of institutional coordination mechanisms must rest on a rigorous assessment of their advantages and weaknesses. The assessment must consider multiple factors, from the stocktaking of resources to the governance of disasters. Above all, the decision-making process is further complicated by varying drought risks, even within the same country. The establishment of the mechanism is a stepwise process, including the mapping of relevant institutions and their mandates, the institutional architecture of the coordination mechanism, the stakeholder engagement, and the communication.

The "Guidelines on Institutional Coordination for Drought Management" report is a stopgap knowledge product. It is prepared to establish a baseline for the theoretical and practical basis of institutional coordination mechanisms. The report is prepared by the Food and Agriculture Organization of the United Nations (FAO), the Global Water Partnership (GWP), and the World Meteorological Organization (WMO) under the framework of the project "Enabling Activities for Implementing UNCCD COP Drought Decisions" funded by the Global Environment Facility (GEF) and implemented in collaboration with the United Nations Convention to Combat Desertification (UNCCD) and other partners. The project is designed to support the operationalization of national drought plans according to the principles of integrated drought management. The report provides guidelines for the identification and selection of appropriate approaches for coordination mechanisms stemming from country-level analyses.

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Abbreviations

COP 13	Conference of Parties at its thirteenth Meeting
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GEF	Global Environment Facility
GWP	Global Water Partnership
IDM	integrated drought management
IDMP	Integrated Drought Management Programme
NDMC	National Drought Mitigation Center, University of Nebraska–Lincoln, United States of America
NDRRMC	National Disaster Risk Reduction and Management Council
NGO	non-governmental organization
OECD DAC	Development Assistance Committee of the Organization for Economic Co-operation and Development
PDSI	Palmer Drought Severity Index
SADC	Southern African Development Community
SPI	standardized precipitation index
UNCCD	United Nations Convention to Combat Desertification
USD	United States dollar
WMO	World Meteorological Organization

Highlights

Institutional coordination and communication are vital for drought management as they enable effective collaboration among government agencies, stakeholders and communities. Coordinated efforts facilitate the sharing of information, expertise and resources, leading to more robust risk assessments and drought management plans, improved community engagement, more timely response, and better preparedness for drought events.

This report offers guidance on establishing and sustaining coordination among institutions and stakeholders involved in drought management. It aims to facilitate the integration of national drought plans into existing national frameworks, drawing from pilot country cases that are part of the Drought Initiative of the United Nations Convention to Combat Desertification (UNCCD). The focus is on institutional arrangements rather than policy alignment, with sections covering the national drought planning process, minimum institutional framework, coordination approaches, stakeholder engagement, communication strategies, and monitoring and evaluation mechanisms. Overall, these guidelines seek to enhance countries' capacities in developing and implementing drought plans and policies in line with international standards, emphasizing the importance of coordination among relevant actors at the national level.

National drought plans developed as part of the UNCCD's Drought Initiative were analysed to define a minimum institutional framework for managing drought. While each country may differ with its specific institutional actors due to variations in governance structure, economic sectors, geography and demographics, there exists a common set of institutions necessary for effective national drought management. Additional institutions tailored to country-specific needs can be incorporated alongside this minimum framework. These additional institutions would be selected according to a country's vulnerable populations, affected sectors, level of risk of natural hazards, scientific institutions and international collaborations.

The minimum institutional framework for managing drought comprises eight institutions or their alternative relevant institution with a similar mandate:

- Head of state or government, or a key political figure's office, should provide leadership, direction, and coordination, or alternatively, provide endorsement and support if a competent technical institution leads drought planning and management in the country with a history of working on drought.
- Ministry of finance has multiple responsibilities, including budget allocation, resource mobilization, financial planning, coordination of expenditure, insurance and risk financing, coordination with the finance departments of other ministries and governmental entities, appraisal of cost and benefits of policy decisions of line ministries, and economic impact assessment.
- National meteorological and hydrological institutes monitor and forecast weather and hydrological conditions, develop drought early warning systems, conduct research and technological innovation, and support plan development.
- The national institute nominated as a focal point to the UNCCD ensures alignment with UNCCD Strategic Objective 3, which is to mitigate, adapt to, and manage the effects of drought in order to enhance the resilience of vulnerable populations and ecosystems.

- Ministry of water is responsible for water resources management, infrastructure development, legislation and policy development, drought preparedness planning, water conservation programmes, emergency response, and research and innovation.
- Ministry of agriculture has multiple responsibilities, including risk assessment and monitoring, drought preparedness planning, crop and livestock management, extension services, water use efficiency, and drought-resistant crop research.
- Ministry of environment or natural resources is tasked with overseeing environmental sustainability and resource conservation measures.
- Ministry or organization for women, gender, or equality is mandated to empower women as key agents of change, advocate for gender-inclusive policies, and foster community cohesion and knowledge sharing.

The additional institutions that a country may need to incorporate in its drought management planning are the following:

- **Vulnerable populations:** ministry of rural or sustainable development, provincial, district and village-level agencies, departments or organizations for indigenous people, minorities, or other vulnerable groups, non-governmental organizations (NGOs), and international and technical support agencies.
- **Affected sector:** ministry of health, ministry of energy, ministry of public works and infrastructure, department of forestry, fire department, department of transportation, department of fisheries, tourism board, and the private sector.
- **High risk of natural hazards:** national disaster risk reduction or management agency, climate change adaptation agency, ministry of interior or civil or public protection, ministry of education, and ministry or department of communication.
- **Research, innovation and collaboration:** universities and research institutes, and ministry of foreign affairs.

There is no universal institutional coordination model, as its applicability depends on the specific country context, encompassing factors such as climate, existing initiatives, governance structure, available resources, and experience of drought and other disasters. Countries should evaluate these factors when selecting an institutional coordination model to determine the most suitable model for their needs. For instance, countries already accustomed to dealing with frequent natural hazards might adopt an existing coordination approach to incorporate drought management, while others with limited drought experience might opt for simpler models. Each model centres around a drought commission and involves a high-ranking minister's office, highlighting the critical role of this aspect of institutional coordination. The taxonomy describes each model and its applicability based on the analysis of national drought plans, accompanied by examples of countries employing the respective approach.

The identified approaches for institutional coordination are the following:

- **Cluster approach:** Working groups are designated to clusters according to the affected sector, e.g. agriculture, water, food, health, etc. Relevant institutions may have representatives in multiple clusters. Each cluster has roles and responsibilities during all phases of drought and is related to all three pillars of integrated drought management (IDM).
- **Standing committee approach:** a vertically aligned approach with a permanent high-level committee anchored to upper levels of government above regional then local committees. Relevant institutions are present in each committee dependent on the scale at which they operate.
- **Technical working group approach:** a single working group incorporating representatives from ministries, departments, technical and research institutions, the private sector, and civil society from all scales and levels.
- **Interinstitutional approach:** a vertically aligned approach with a high-level decision-making authority above a multi-sectoral advisory group above organizations working on the ground.

- **Taskforce and subcommittee approach:** an approach conforming to UNCCD's guidance with a drought taskforce overseeing two subcommittees dedicated to preparation, mitigation and response, and monitoring and risk assessment.
- **Three pillars approach:** multisectoral representatives form working groups that align with each of the three pillars of IDM.
- **Drought phases approach:** multisectoral representatives form working groups within a drought commission that align with each phase of drought.
- **Functions approach:** a horizontally aligned approach with working groups that have a designated function, which is typically a role in drought management (e.g. communication, monitoring and warning, evaluation, etc.). These functional working groups may contain clusters in accordance with the cluster approach.

For a national drought plan to be effective, it is essential to engage all relevant institutions, sectors and stakeholders within a country. This engagement involves seeking input from civil society groups vested in drought planning, ensuring fair representation and consideration of diverse interests, in particular considering women, indigenous peoples, and other affected populations. Furthermore, stakeholder participation is crucial for resolving conflicts between key water use sectors, which is particularly important as droughts intensify. Examples from various countries illustrate how approaches for stakeholder engagement vary across different institutional coordination models. However, stakeholder engagement approaches used by some models, or aspects thereof, can generally be transferred to other models.

Effective communication among the various institutions collaborating on drought management within a country is essential for success. This involves commissions, committees and working groups, each with its own tasks and objectives, but interconnected communication and information flow between them is necessary for effective drought planning and management. Establishing communication protocols before a drought occurs ensures that communication plans are followed consistently during preparatory, response, and recovery periods. A well-defined drought communication strategy aims to develop cost-efficient and effective communications at subnational, national and international levels. Public dissemination of information, especially during non-drought periods, through well-recognized events plays a crucial role in raising awareness. Different communication channels and tools, such as print media, electronic media, direct stakeholder engagement, and social media platforms, are utilized to disseminate information about drought management. It is important to ensure translations into all necessary languages and to consider clear and simple communication protocols to reach vulnerable populations. Various institutional coordination approaches incorporate communication strategies tailored to their specific structures, though lessons can be learned and transferred to other models. Examples from different countries illustrate how these approaches facilitate communication and information exchange among actors involved in drought management.

The guidelines emphasize the necessity of involving multiple institutions in integrated drought management and the importance of their awareness of each other's actions. For instance, if an institution undertakes a project to enhance water supply, agricultural resilience or income diversification, its effects on drought management should be evaluated for inclusion in national drought plans. Monitoring and evaluation of institutional coordination within national drought plans are thus crucial for assessing effectiveness, identifying weaknesses, allocating resources efficiently, and promoting stakeholder engagement. Mechanisms for monitoring and evaluation, such as a framework and a designated working group, cluster or subcommittee, are essential. Diverse approaches to monitoring and evaluation are showcased from several countries, involving different institutions and stakeholders, with regular evaluations being crucial for dynamically adapting drought management strategies. ■

1 Introduction

Droughts affect more people and are responsible for more deaths and damages than any other natural hazard. According to the United Nations Convention to Combat Desertification (UNCCD, 2023), 1.84 billion people were drought-stricken in 2023, out of which 4.7 percent were exposed to severe or extreme drought. Droughts currently cost around USD 125 billion globally with projections estimating that, due to climate change, by 2050, droughts may affect over three-quarters of the world's population.

Drought is a recurring phenomenon, which is not specific to any particular type of climate. It occurs on all continents and can vary in intensity, duration and spatial scale. Droughts begin with a precipitation deficit; if that deficit persists, droughts progress to soils, rivers and aquifers. Ultimately, the entire water cycle is disrupted and water use, both natural and human, is affected. The severity of drought depends not only on its duration, the intensity of the rainfall deficit, and its spatial extension, but also on the water needs of human activities and vegetation. Whether a drought has impacts depends on the level of vulnerability of the affected systems as impacts will be experienced differently by different societal groups and sectors even within the same drought event. Drought is distinguished from aridity by its temporal limitation and distinguished from water scarcity by its being a solely natural phenomenon. However, human actions can and often do exacerbate, as well as alleviate, drought.

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When considering the effects of drought, these are often included and reported: low reservoir levels, diminished water access, reduced crop production, higher food prices, food insecurity, forest fires, biodiversity loss, decreased hydropower generation, and many other cascading environmental and socioeconomic impacts. Clearly, the risks associated with drought are complex, multisectoral, multitemporal and multiscale. Managing these risks thus requires the involvement of numerous institutions and stakeholders covering all the applicable sectors, scales and expertise. This broad set of actors should be involved in all aspects of drought preparedness, monitoring, early warning, impact assessment, intervention, mitigation and evaluation. It is crucial to ensure the coordination, integration and harmonization of all actors (ministries and departments, local authorities, technical services, private sector, researchers, civil society, representatives of vulnerable groups, etc.) at all scales (national, subnational, local). Beyond the multiple scales and sectors that define the composition of the stakeholders, the periodicity of drought adds further complexity. While institutional frameworks often evolve slowly and gradually, the unpredictability of drought events in the long term requires a certain level of flexibility. The historical frequency and severity of drought can define the longevity of the institutions, be it a permanent, semi-permanent or temporary organizational setting. However, future alterations to the typical patterns and impacts must also be factored into the design of the institutional framework.

The shift from reactive to proactive drought management necessarily involves the reconsideration of the institutions dealing with drought. Crisis management, by nature, relies on ad hoc, temporary institutions that are mandated to address the direct consequences. By contrast, proactive management rests on pre-disaster operations; therefore, the institutional framework must be planned beforehand. The planning process is neither linear nor identical in different countries. For example, countries frequently hit by severe drought might prefer permanent and independent institutions that are mandated solely with drought management to avoid the high transaction costs of the periodic re-assembling of institutional stakeholders. Other countries with less frequent and localized drought events may choose to integrate drought management functions into existing institutions, thus, reducing the opportunity cost of an independent institution. While it is important to configure institutional mechanisms to specific country contexts, identifying typical frameworks and approaches can guide decision making.

This document provides guidelines for establishing and maintaining institutional coordination between the actors involved in drought management. The presented coordination approaches aim to integrate national drought plans into existing relevant national frameworks. The focus of the guidelines is on the institutional arrangements rather than on policy alignment. These coordination models have emerged from a number of country cases.

The guidelines include the following sections:

- Section 2 explains the need for these guidelines.
- Section 3 shows how institutional coordination fits into the overall drought plan development process and clarifies the importance and roles of strong leadership.
- Section 4 states the institutions whose involvement is fundamental for integrated drought management (IDM).
- Section 5 provides a taxonomy of different coordination models and guidance on how a country should select which model to implement.
- Section 6 illustrates approaches for ensuring all relevant stakeholders are involved in drought management.
- Section 7 showcases communication strategies during all phases of drought.
- Section 8 describes frameworks for ensuring the continued effectiveness of drought management. ■

2 Background

Upon the request of the Conference of Parties at its thirteenth Meeting (COP 13) in Ordos, China in September 2017, the UNCCD and partner institutions established the Drought Initiative. The Drought Initiative is based on the premise that the impact of a drought is not determined solely by its severity but by the ability of communities and countries to anticipate and prepare for it. The Drought Initiative focuses on three actions:

- setting up drought preparedness systems, particularly national drought plans;
- working together at the international and regional levels to reduce drought vulnerability and risk; and
- providing a toolbox that stakeholders can use to boost the drought resilience of both people and ecosystems.

Since the establishment of the Drought Initiative in 2018, the UNCCD has been supporting the development of comprehensive national drought plans. Of the over 70 countries participating in the initiative, 34, so far, have published their national drought plans. These national drought plans can be considered the source data for the production of these guidelines (Figure 1). Further best practices and case studies were collected from three workshops conducted in 2023, organized by the Food and Agriculture Organization of the United Nations (FAO), UNCCD, World Meteorological Organization (WMO), and Global Water Partnership (GWP).

The national drought plans were prepared based on the *National Drought Management Policy Guidelines: A Template for Action* prepared by the Integrated Drought Management Programme (IDMP) (WMO and GWP, 2014). The template includes chapters with explicit reference to the institutional coordination mechanism, thus, providing a starting point for the analysis in this report.

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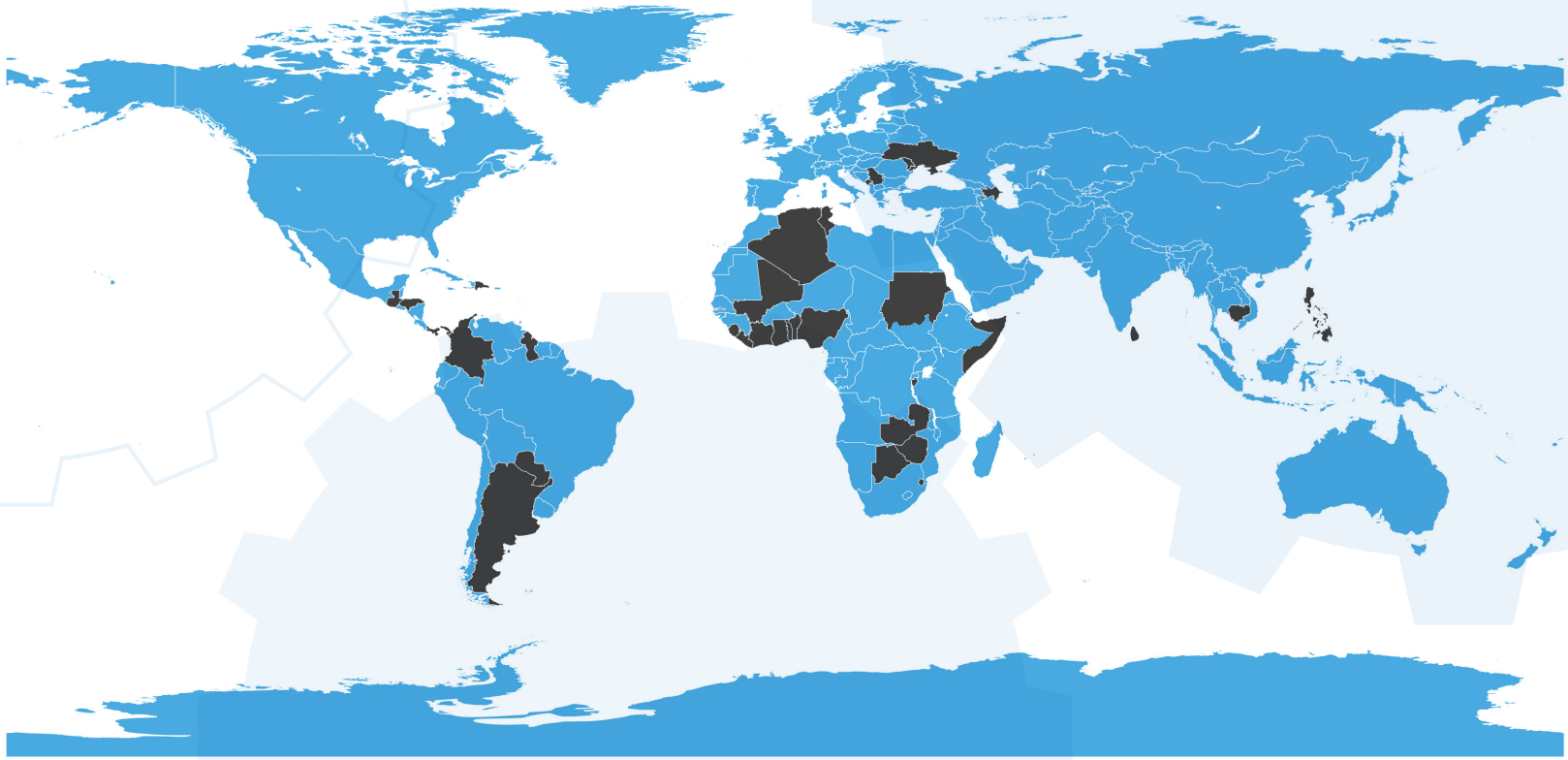
FIGURE 1. COUNTRIES WITH PUBLISHED NATIONAL DROUGHT PLANS AS OF 2024



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Source: Modified by the authors based on United Nations Geospatial. 2020. Map geodata [shapefiles]. New York, USA, United Nations.

The specific guidelines in this document are an element of the overall goal to implement drought plans and policies, with the objective of evaluating and illustrating the need for coordination among different relevant actors for drought management, mainly on the national level. These guidelines analyse and showcase existing coordination models and institutional arrangements to develop a taxonomy of different approaches for drought coordination. ■

3 The reference to coordination mechanisms in the national drought planning process

3.1. Planning for drought management

National drought plans play a crucial role in IDM by providing a comprehensive framework to address the various aspects of drought. Countries that have yet to produce a drought plan usually already have some drought response measures in place. However, these measures are often reactive rather than proactive, and are often insufficiently comprehensive or integrated while overlooking the needs of vulnerable populations most affected by drought. National drought plans put all the pieces together and identify gaps in national drought preparedness and planning. They indicate measures to be implemented as soon as the possibility of drought is signalled by meteorological services.

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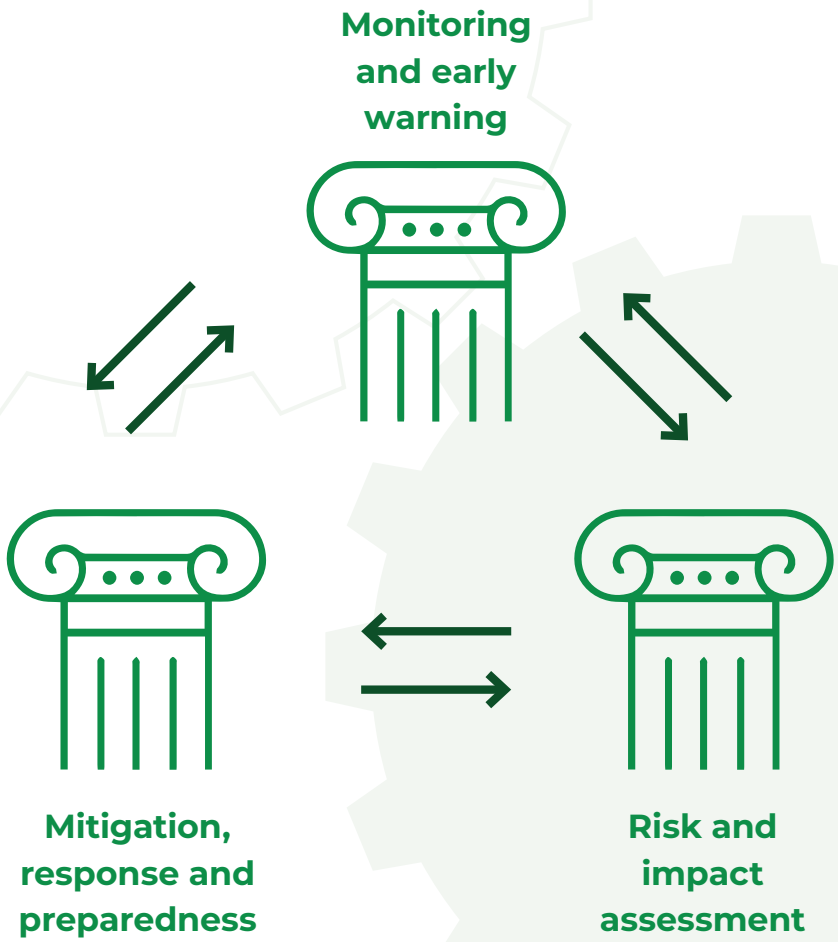
FIGURE 2. THE THREE PILLARS OF INTEGRATED DROUGHT MANAGEMENT



Source: Authors' own elaboration based on the work of Integrated Drought Management Programme, 2024.

The three pillars of drought management form the building blocks of successful drought planning (Figure 2).

The role of national drought plans and policies, incorporating the three pillars, is manifold:

- **Risk assessment and monitoring:** National drought plans involve the identification and assessment of drought-prone areas under current and future climate change conditions, as well as the establishment of monitoring systems to track meteorological, hydrological and agricultural indicators. This helps in early detection and response to emerging drought conditions.
- **Early warning systems:** National drought plans aim to establish effective early warning systems that can alert relevant authorities and communities about impending drought conditions. This allows for timely preparedness and response measures to minimize the impacts of drought.
- **Coordination and collaboration:** Integrated drought management emphasizes the need for coordination among various sectors and stakeholders. All the roles in this list require multiple institutions, thus good coordination is crucial. National drought plans facilitate collaboration between government agencies, local communities, non-governmental organizations (NGOs) and international partners, among others, to ensure a unified and effective response to drought events.
- **Water resource management:** National drought plans include strategies for sustainable water resource management, including efficient water use, the development of water-saving technologies, and the establishment of water conservation measures during drought periods.
- **Agricultural practices and livelihoods:** National drought plans recommend policies to address the impacts of drought on agriculture and rural livelihoods. These may involve the promotion of drought-resistant crops, sustainable farming practices, and the provision of support mechanisms for affected farmers.
- **Social safety nets:** National drought plans incorporate social safety nets to assist vulnerable populations affected by water scarcity. This may include the provision of food aid, financial assistance or employment opportunities during periods of drought.

- **Legislation and regulation:** National drought plans specify policies to establish a legal framework to support drought management efforts. This includes regulations for water use, land management, and the enforcement of sustainable practices to mitigate the impact of drought on ecosystems and communities.
- **Public awareness and education:** National drought plans include initiatives to raise public awareness about drought risks and the importance of water conservation. Education campaigns help communities better understand the challenges posed by drought and encourage proactive measures.
- **Research and innovation:** National drought plans emphasize the importance of research and innovation in developing new technologies and approaches for drought management. This includes investments in scientific studies, data collection, and the development of drought-resistant technologies.

National plans and policies define the level of stakeholders and the desired coordination mechanism as a standalone chapter to emphasize its importance. Additionally, well-developed institutional frameworks have a contribution to all roles listed above. The diversity of roles also highlights that institutions should be integrated not only in the downstream but in the upstream sectors of drought management. More precisely, it is insufficient to coordinate only with stakeholders from the sectors that are directly affected by drought. Sectors that facilitate proactive drought management, such as the education system or research and innovation, are fundamental to creating functional institutional coordination.

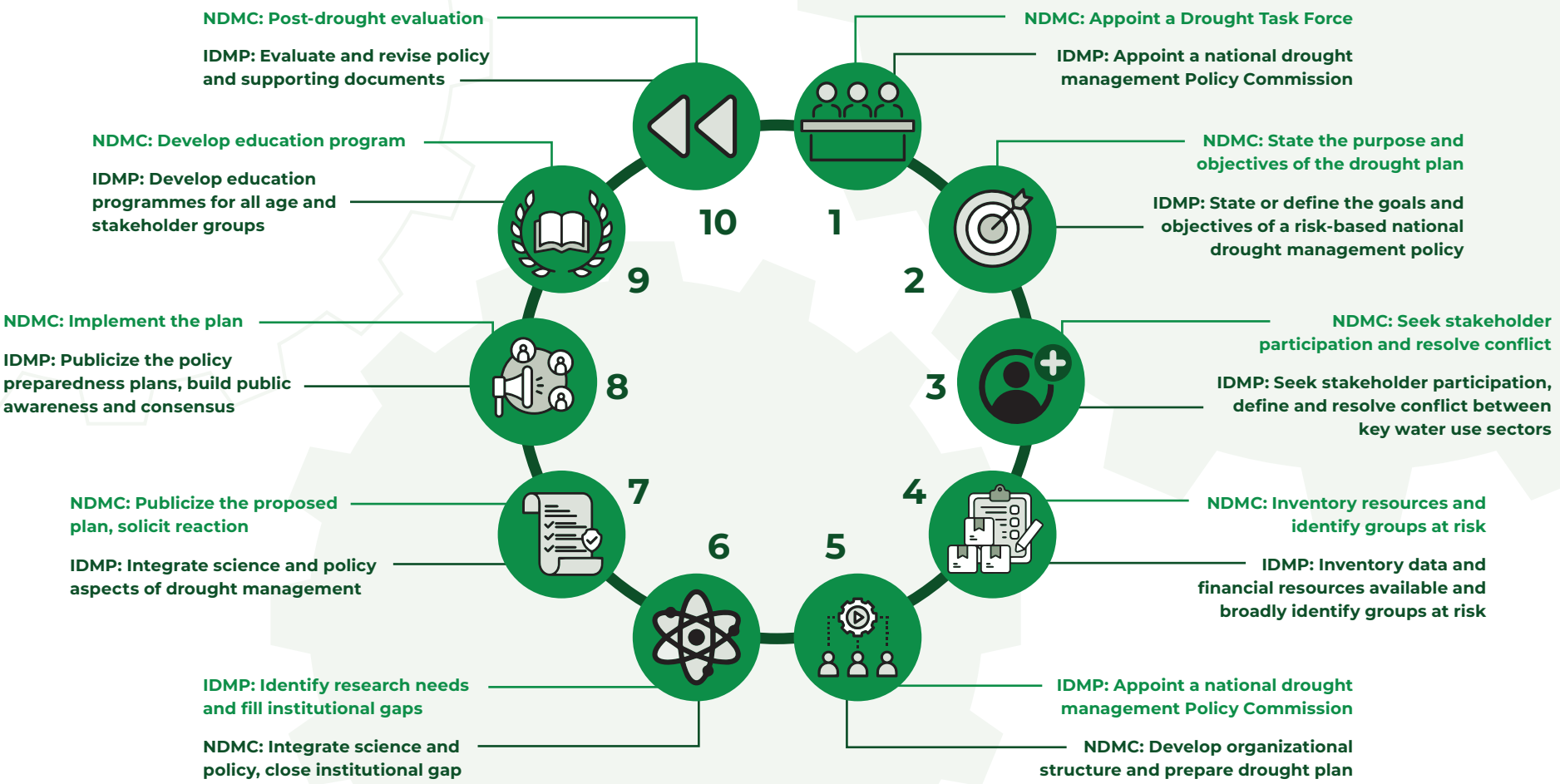
In summary, national drought plans and associated policies are comprehensive frameworks that integrate various strategies to enhance preparedness, response, and recovery from drought events. They promote a holistic approach that involves multiple stakeholders and sectors to effectively manage the complex challenges associated with drought.

3.2. The reference to coordination mechanisms in the national drought planning process

The *National Drought Management Policy Guidelines* (WMO and GWP, 2014) provide a template for action that countries can use in the development of national drought management, preparedness and mitigation plans. The process is structured in ten steps that can be adapted by countries to reflect their institutional, infrastructure, legal, socioeconomic and environmental contexts. The ten-step process was originally developed by the National Drought Mitigation Center, University of Nebraska (NDMC) by Wilhite et al. (1999) and is continually iteratively updated and improved by IDMP.

Athough the focus of these guidelines is on institutional arrangements rather than policy alignment, an important point is worth emphasizing. When following the ten steps to produce a drought plan, it is important to identify existing plans, strategies, policies and legislation that are relevant to national drought planning and risk reduction. Most countries will already have strategies and policies aiming, for example, to enhance water security, achieve sustainable development goals, reduce risks associated with natural hazards, conserve natural resources, combat desertification, increase national wealth, empower women and girls, and increase the nation's resilience to climate change. Within these plans, strategies, policies and legislation, there will likely be aspects that will directly or indirectly better prepare for and reduce the risk of drought. It is very important for a national drought plan to align with these existing structures and not run counter to longer-term national strategies.

FIGURE 3. THE INTEGRATED DROUGHT MANAGEMENT PROGRAMME'S TEN-STEP PROCESS FOR DROUGHT PLANNING



Notes:
IDMP - Integrated Drought Management Programme; NDMC - National Drought Mitigation Center

Source: Authors' own elaboration based on the work of Wilhite, D. A., Hayes, M. J., Knutson, C. & Smith, K. H. 1999. *The basics of drought planning: a 10-step process.* Nebraska, National Drought Mitigation Center. https://www.droughtmanagement.info/literature/NDMC_basics_drought_planning_10_step_process_1999.pdf; World Meteorological Organization (WMO) and Global Water Partnership (GWP). 2014. *National Drought Management Policy Guidelines: A Template for Action* (D.A. Wilhite). Integrated Drought Management Programme (IDMP) Tools and Guidelines Series 1. Geneva, WMO and Stockholm, GWP. https://www.droughtmanagement.info/literature/IDMP_NDMPG_en.pdf.

The ten-step process includes multiple steps directly related to the coordination mechanisms. Above all, step 1 on the appointment of a commission, originally proposed as a "drought taskforce" by the NDMC, stipulates the composition of entities responsible for drought management. The commission is responsible for the supervision of coordination of the development of the plan. Entities responsible for the coordination of drought management, in other words, the implementation of the plan, might be the same institutions. A taskforce or commission assembled for the development of the plan would suggest a temporary or ad hoc operation, while the plan's implementation often requires a more permanent stakeholder structure. Nevertheless, the rigorous execution of step 1 may indicate the way forward for the establishment of the national-level coordination mechanism for the entire drought planning and management cycle. Step 3 calls for the inclusive identification of stakeholders. This step is also relevant to the coordination mechanisms, as some stakeholder groups must be directly engaged in the institutional framework to represent their interest throughout the management process. Step 5 builds on the coordination mechanism proposed in step 1 by identifying specific committees and technical groups responsible for different aspects of the planning process. Finally, step 6 is executed to identify the research needs and institutional gaps. It ensures that all institutions are duly involved, and if there is no existing institution to carry out a task, it recommends the identification of remediation strategies (e.g. delegation of the task or establishment of a new entity).

3.3. Strategic leadership and its composition in the drought planning and management processes

The importance of the drought commission is highlighted by the IDMP ten-step template for action that proposes the drought commission (also called a drought taskforce or steering committee) as step 1 of the planning processes. The drought commission is led by – or at the very least endorsed by – the head of state or government, or a key political figure. This leadership or endorsement is vital to ensure broad support and participation from all relevant parties.

The drought commission's role is twofold. First, it supervises and coordinates the plan development process by consolidating resources from national government ministries. This involves at least minimal new resources (human and financial), primarily redirecting existing ones. Second, once the plan is formulated, the commission becomes the authoritative body responsible for its implementation across all government levels. The overall principles form the basis for preparedness or mitigation plans at the subnational level. Additionally, the commission activates policy elements during drought periods, coordinating actions and implementing mitigation and response programmes. Recommendations are initiated to the political leader or legislature, with specific actions implemented within the authority of the commission and the represented ministries.

The composition of the drought commission is crucial, reflecting the multidisciplinary nature of drought. It should include all relevant national government ministries, even, potentially, drought experts from academia, and if the head of state or government or a key political figure is not an inherent part of the commission, then a representative from their office to enable streamlined communication and awareness of drought status, impacts and actions to the highest governmental level. Consideration should extend to representatives from key sectors, professional services and civil society including the most vulnerable to drought. Appropriate public information management, i.e. through a dedicated communication specialist or public information department, is essential for effective communication, ensuring a clear and concise message to the public amid the scientific, subnational and sectoral complexities of drought. Engaging a public participation practitioner ensures inclusive policy development by orchestrating input from diverse stakeholder groups. This observer or ex-officio member attends drought commission meetings, facilitating the involvement of well-funded as well as vulnerable stakeholder groups.

The drought commission should initiate an inventory of natural, biological and ecological, human, and financial resources that could potentially be affected by drought, as indicated by step 4 of the IDMP ten-step template for action. While information about natural, biological and ecological resources is often available from various agencies, it is crucial to assess their vulnerability during water shortages caused by drought. Key natural resources include water, climate and soils, while biological and ecological resources encompass grasslands, forests, wildlife and wetlands. Human resources involve labor for various tasks related to water provision and citizen response.

It is important for the drought commission to identify constraints to the national drought plan development process and to the activation of the various elements of the plan as drought conditions develop. These constraints may be financial, legal or political. The costs associated with national drought plan development must be weighed against the losses that are likely to result from inaction. Legal constraints can include water rights, existing public trust laws, requirements for public water suppliers, transboundary agreements, and liability issues. Based on experience, the lack of or insufficient legal regulatory framework often impedes institutional coordination mechanisms. In many cases, coordination mechanisms are defined at the national level but are not supported by a legislative act, thus, remaining non-operational. A less constraining, yet consequential scenario, is when legally established coordination mechanisms are hindered by legal constraints, meaning that they are not capacitated to be able to take relevant actions.

Transitioning from crisis to risk management requires identifying high-risk areas and outlining proactive actions to reduce risks before droughts occur. Risk is defined by hazard, exposure and vulnerability to drought-induced water shortages. Assessing historical and projected hazards and exposure is crucial due to climate change to facilitate forecasting of mid and long-term changes in drought risk. Vulnerability is influenced by social factors; therefore, detailed assessments should be directed to subnational (province, state or district) working groups with local knowledge and input from stakeholders. During this transition, institutional gaps may emerge, indicated also by step 6 of the IDMP ten-step template for action, such as deficiencies in monitoring station networks or the need to automate and network meteorological, hydrological and ecological systems for timely data retrieval. The drought commission plays a pivotal role in filling these gaps, coordinating institutions, and developing and implementing the national drought management plan.

3.4. Mainstreaming institutional coordination mechanisms in the drought planning and management processes

The ten-step process supports the know-how of the planning process, in other words, it introduces a specialized planning technique. On the other hand, the Model National Drought Plan, compiled by the UNCCD and adopted by the Drought Initiative members, recommends the structure of the national drought plan to synthesize the output of the ten-step process (UNCCD, 2019). As such, the ten steps are reduced to eight, which are published as the template for the national drought planning process with nine chapters (Figure 4).

Chapter 4 of the structure, “Organization and assignment of responsibilities”, is entirely dedicated to the proposal of institutional frameworks. Chapter 7 “Drought communication and response actions” complements it by proposing communication and coordination guidelines. The reason for the two separate chapters on institutions and communication and coordination is due to differences in definitions. Although institutional frameworks and coordination mechanisms are virtually inseparable, and the terms are often used interchangeably, there is a conceptual difference between them. An institutional framework is a hierarchical composition of institutional actors involved in a management process. Coordination mechanisms are operated by the institutional framework through a set of instruments – policy, legal and communication instruments, among others – financial resources, specified data, etc. In conclusion, having identified institutions and responsibilities is insufficient. How institutions fulfill their responsibilities depends on many factors and resources, which must be organized in a process flow that is specified in the national plans. ■

FIGURE 4. THE TEMPLATE PROVIDED BY THE UNCCD MODEL NATIONAL DROUGHT PLAN WITH THE COORDINATION-RELATED CHAPTERS HIGHLIGHTED

1 Background

- Purpose, scope, goals and objectives
- Plan development: introduction of the ten-step process

2 Relationship with other plans and policies

- National water laws, existing drought mitigation strategies and planning issues
- Importance of national drought plan
- International laws relating to human rights obligations for access to safe water

3 Overview of drought in the country

- Historical occurrences
- Understanding drought
- Drought impacts by sectors

4 Organization and assignment of responsibilities

- Organizational overview
- Assignment of responsibilities

5 Drought monitoring, forecasting and impact assessment

- Drought indices
- Current monitoring, forecasting, and data collection
- Drought severity in all relevant sectors
- A drought impact assessment methodology

6 Drought risk and vulnerability

- The drought risk and vulnerability assessment and GIS mapping
- Drought risk areas in various administrative areas

7 Drought communication and response actions

- Drought communication protocol
- Declaration of drought conditions
- Communication and coordination guidelines
- Drought response actions

8 Drought mitigation and preparedness

- National water resources monitoring and impact assessment
- Development of new and alternative water sources
- Water conservation practices/public education awareness and outreach
- Prioritization of water supply to meet minimum access rights to water
- Legislation and land use planning

9 Recommendations and implementation actions

- Priority implementation actions
- Future updates and revisions

Source: Author's elaboration based on the United Nations Convention to Combat Desertification (UNCCD). 2018. *Model National Drought Plan*. Bonn, UNCCD. https://www.unccd.int/sites/default/files/2021-12/Model%20National%20Drought%20Plan%20Guidelines.pdf.

4 The minimum institutional framework for managing drought

Many national drought plans were developed under the UNCCD's Drought Initiative using the Model National Drought Plan as a template. Analysis of the national drought plans reveals a minimum institutional framework for managing drought. This represents the institutional actors that are fundamental for drought management in every country, regardless of their specific political, economic and geographic situation (Figure 5).

The minimum institutional framework is the baseline to which additional institutions relevant to country-specific needs should be incorporated. Every country will have differences in its institutional actors involved due to differences in governance structure, important economic sectors, geography and climate, and the makeup and socioeconomics of its population (Figure 6). Yet, the analysis showed a minimum common denominator of institutions required for national drought management. The institutions may be named differently in different countries. They may be combined, such as ministries of agriculture and rural development, or they may be split, such as distinctive agencies for meteorology and for hydrology, or they may be departments and agencies within parent ministries, such as meteorological agencies under a ministry for the environment. Other ministries also play a role in coordinating and influencing the operations of others. For instance, in some countries, the ministry of finance works with the finance departments of line ministries and governmental entities to ensure the enforcement of financial regulations and to aid in evaluating policies and programmes during the decision-making process.

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The additional institutions are organized by category: vulnerable populations, affected sectors, high risk of natural hazards, and research, innovation and collaboration. It is a consideration of these categories, e.g. which populations are vulnerable to drought, which sectors are affected by drought, and what are the levels of risk to drought, climate change and other hazards, that should guide a country in its selection of institutions that need to be incorporated in drought management.

Example countries are provided that involve the particular institution in their national drought plans to illustrate the range of countries in support of the information on applicability. More details on these country examples are provided in Section 5, where the actual named institutions, their roles, and their position in institutional coordination models are shown and described.

FIGURE 5. INSTITUTIONS FUNDAMENTAL FOR DROUGHT MANAGEMENT, THEIR APPLICABILITY FOR DIFFERENT COUNTRY CONTEXTS, AND THEIR ROLES

Head of state or government, or a key political figure's office

APPLICABILITY

Fundamental; however, in some countries, drought planning and management may be led by a competent technical institution with a history of working on drought. Involvement of the head of state or government or a key political figure's office remains fundamental, but for endorsement and support rather than leadership. Examples include the Environment Agency, which leads drought planning in the United Kingdom of Great Britain and Northern Ireland; K-water, which leads on drought in the Republic of Korea; and the National Water Agency (Agência Nacional de Águas e Saneamento Básico or ANA) as the responsible agency for drought in Brazil.

CRITICAL ROLES IN DROUGHT MANAGEMENT

Provide leadership, direction and coordination: to take the lead, as the highest executive authority, in establishing a national drought commission, ensuring that it encompasses relevant ministries, experts, and stakeholders. They facilitate effective communication, raising awareness of drought impacts and driving the implementation of drought policies at all government levels. Additionally, the person or office plays a crucial role in lobbying for necessary resources, mobilizing support, and overseeing the execution of preparedness plans, response actions and mitigation strategies, thereby guiding the nation's unified approach to addressing the multidimensional challenges posed by drought.

Alternatively, provide endorsement and support: to demonstrate commitment to proactive risk management, resource allocation, and coordination among national, state and local agencies. Such support signals to the public and international community the seriousness with which the government regards drought as a pressing environmental and humanitarian concern, fostering cooperation and collective action towards sustainable solutions.

Ministry of finance

APPLICABILITY

Fundamental

CRITICAL ROLES IN DROUGHT MANAGEMENT

Financial planning: to ensure that sufficient funds are earmarked for drought response and recovery, which involves forecasting potential financial requirements based on the severity and duration of drought events.

Resource mobilization: to mobilize financial resources from domestic and international sources to support drought-related projects and programmes, including seeking funding from development partners, international organizations and grants.

Fiscal incentives for drought-resilient practices: to introduce fiscal incentives or tax breaks to encourage the adoption of drought-resilient agricultural practices and water-efficient technologies.

Assessment of the materiality: to assess or predict the financial materiality of drought events.

Economic impact assessment: to evaluate the financial implications of drought on various sectors to aid formulation of appropriate fiscal policies and allocation of resources for recovery efforts.

Insurance and risk financing: to explore and implement financial instruments, such as insurance and risk financing mechanisms, to mitigate the economic impact of drought on affected sectors and to provide financial relief in the aftermath of drought-related losses.

Budget allocation: to fund drought management programmes, early warning systems, and preparedness initiatives.

Coordination of expenditure: to coordinate expenses related to drought response and recovery across various government departments and agencies, ensuring efficient utilization of funds and avoiding a duplication of efforts.

Support for agricultural finance: to provide financial support, subsidies or incentives for farmers affected by drought, which could include concessional loans, grants or insurance schemes to protect farmers' income.

Debt management: to manage public debt and explore debt relief options for regions or communities severely affected by drought to help alleviate financial burdens during challenging times.

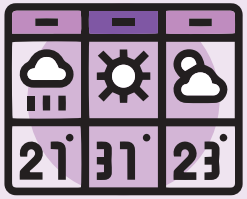
Correction of market imperfections: to introduce measures to address imperfections and remove barriers to private sector finance.

National meteorological and hydrological services

APPLICABILITY

Fundamental

CRITICAL ROLES IN DROUGHT MANAGEMENT



Monitoring weather and hydrological conditions: to generate information for understanding meteorological variables, hence identifying and forecasting drought. Monitoring soil moisture, river flow and groundwater levels is essential for assessing water availability and drought severity.

Climate forecasting: to predict periods of reduced precipitation or prolonged dry spells, enabling better preparation for potential drought events.

Drought early warning systems: to operate these systems based on an analysis of hydrometeorological and other relevant data means they can issue timely alerts, allowing communities and authorities to prepare for and respond to impending droughts.

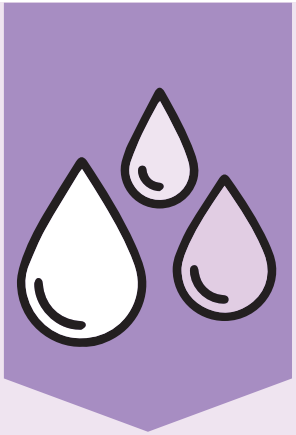
Drought risk assessment: to assess the hazard during a drought through an analysis through an analysis of historical hydrometeorological data as well as future climate change scenarios. Combined with an assessment of vulnerability and exposure, this will aid in understanding the frequency, intensity and related changes of drought events, guiding long-term planning and risk reduction strategies.

Triggering actions: to establish sector-specific indices that can trigger early actions on the ground. In most cases, the triggers consist of combined drought indices that set a threshold, beyond which drought impacts on the sector are foreseen.

Research and development: to conduct research on climate patterns and variability, which will inform the development of more accurate models and tools for drought prediction and monitoring.

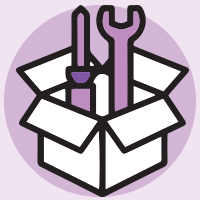
Technological innovation: to provide technological ingenuities, including the use of remote sensing and advanced modelling techniques, to enhance the accuracy and timeliness of drought assessments.

Policy support: to contribute to the formulation of effective strategies for drought resilience and adaptation.



Ministry of water

APPLICABILITY



Fundamental; however, in some countries, this ministry may not exist, in which case the roles should be assigned to the alternative relevant institution, such as the ministry of agriculture or the national meteorological and hydrological services.

CRITICAL ROLES IN DROUGHT MANAGEMENT

Water resources assessment: to monitor and forecast water resources availability and quality, under different scenarios, and to provide relevant agencies with data on water, including the water available for allocation during drought periods.

Water demand assessment: to assess water needs and uses, covering all sectors, and match the water supply with the demand in the format of water balance, in with- and without-drought periods.

Water resources management: to manage water resources efficiently, especially during drought periods, including monitoring water availability and usage, and implementing conservation measures.

Legislation and policy development: to develop and implement water-related legislation and policies that consider drought management and resilience, including regulations for sustainable water use, permits, and restrictions during drought conditions, including the definition of priority order among water users.

Drought preparedness planning: to manage the development and implementation of strategies to address water scarcity issues during droughts, involving measures to enhance water storage, distribution and efficiency.

Infrastructure development: to oversee the development and maintenance of water infrastructure, including dams, reservoirs and irrigation systems, all of which are critical in both drought and non-drought periods.

Water conservation programmes: to promote and implement water conservation programmes to encourage efficient water use in various sectors, including agriculture, industry and households.

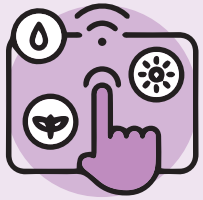
Strategic water reserves: to ensure that strategic water reserves are available in emergency periods, which can be mobilized without the overexploitation of water resources.

Emergency response: to play a key role in coordinating emergency responses during severe droughts, such as water rationing, implementing water-saving practices, or providing emergency water supply like water trucks.

Research and Innovation: to develop technologies and practices that enhance water efficiency and resilience to drought, such as new irrigation methods and water harvesting techniques.

Ministry of agriculture

APPLICABILITY



Fundamental. This ministry is involved in all the example countries' national drought plans.

CRITICAL ROLES IN DROUGHT MANAGEMENT

Risk assessment and monitoring: to assess the vulnerability of agricultural systems to drought and continuously monitor climatic conditions to identify early signs of drought stress on crops and livestock.

Drought preparedness planning: to develop and implement strategies to mitigate the impact of drought on crops, livestock, and overall agricultural productivity.

Financial support: to provide financial assistance and support mechanisms for farmers affected by drought, including subsidies, insurance programmes, or low-interest loans to help farmers recover from drought-related losses.

Extension services: to offer extension services and training programmes to farmers to enhance their capacity to cope with drought. These could include promoting water-saving irrigation techniques, soil moisture conservation methods, and sustainable farming practices.

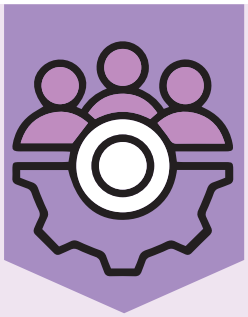
Education and capacity building: to develop knowledge products on drought management in agriculture and distribute them to farmers through different channels.

Crop and livestock management: to provide guidance to farmers on adaptive agricultural practices during drought conditions, such as selecting drought-resistant crop varieties, adjusting planting schedules, and managing livestock feed and water resources efficiently.

Livestock health and management: to implement measures to safeguard the health and well-being of livestock during drought, including provision of supplementary feed, vaccination programmes, and guidance on destocking strategies to match available forage resources.

Water use efficiency: to promote and implement water-efficient irrigation practices and technologies to optimize water use in agriculture, which is essential for ensuring sustainable water management during periods of water scarcity.

Research and technology: to conduct research on the impact of drought on crops and the response of crop yield to water stress, and to develop, test, validate and prepare technologies for scale-out of drought-resistant crop varieties that can withstand water scarcity conditions, for example.



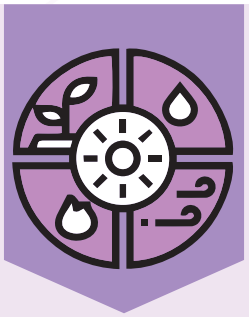
National institute nominated as a focal point to the United Nations Convention to Combat Desertification (UNCCD)

APPLICABILITY

Fundamental

CRITICAL ROLE IN DROUGHT MANAGEMENT

Alignment with UNCCD Strategic Objective 3: to ensure that the commitment to the Convention is implemented, particularly in relation to the drought-relevant objective that is to mitigate, adapt to, and manage the effects of drought in order to enhance resilience of vulnerable populations and ecosystems.



Ministry of the environment or natural resources

APPLICABILITY

Fundamental; however, depending on the government structure, these roles may be covered by other ministries like water and agriculture. Example national drought plans that include this ministry are Azerbaijan, Botswana, Eswatini and Guyana.

CRITICAL ROLES IN DROUGHT MANAGEMENT

Overseeing environmental sustainability and resource conservation measures: to promote water resource management, soil conservation, and sustainable land use practices to mitigate the impacts of drought. They contribute to the identification and protection of critical ecosystems, ensuring the preservation of biodiversity and natural habitats. By fostering sustainable practices and addressing the root causes of environmental degradation, they build resilience and minimize the adverse effects of drought on ecosystems and communities.

Creating synergies the Rio Conventions: to ensure that resources are used in a synergetic manner to address drought, land use, climate change and biodiversity issues through combined measures.

Ministry or organization for women, gender or equality

APPLICABILITY

Fundamental if the country has such a ministry or organization. Institutions dedicated to women's affairs are present in a diverse range of countries where there is gender inequality, manifested as systemic discrimination in areas such as education, employment, healthcare, and political participation, which may be related to cultural or traditional barriers. Example countries involving this institution include Côte d'Ivoire, Mali, Panama and Tunisia.

CRITICAL ROLES IN DROUGHT MANAGEMENT

Empowering women as key agents of change: to enhance women's access to resources, education, and skills that can improve water management, agricultural practices, and community preparedness.

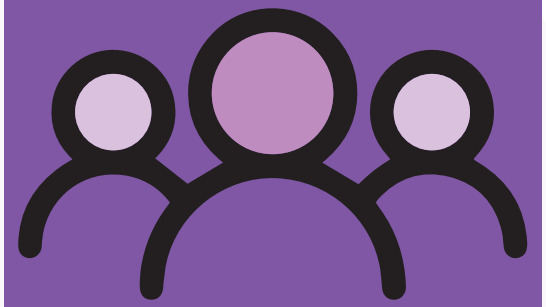
Advocating gender-inclusive policies: to ensure that the specific needs and perspectives of women are integrated into drought response and mitigation.

Fostering community cohesion and knowledge sharing: These organizations contribute to building adaptive capacity, promoting sustainable practices, and creating a more resilient and equitable response to the challenges posed by drought.

Source: Authors' own elaboration.

FIGURE 6. INSTITUTIONS ADDITIONAL IN DROUGHT MANAGEMENT IN CERTAIN COUNTRY CONTEXTS, THEIR APPLICABILITY, AND THEIR ROLES

Vulnerable population



Ministry of rural or sustainable development

APPLICABILITY

Fundamental for countries with significant rural populations, especially where those rural populations have heightened vulnerability to drought, such as where rainfed agriculture predominates. There are numerous example countries that involve such a ministry or national council, such as Algeria, Argentina, Montenegro and Sri Lanka.

POTENTIAL CRITICAL ROLES IN DROUGHT MANAGEMENT

Community resilience building: to implement programmes and projects that enhance the resilience of rural communities, in particular, to drought impacts. This involves the promotion of sustainable agricultural practices, water conservation, and alternative livelihoods to reduce vulnerability.

Social safety nets: to design and implement social safety net programmes to assist vulnerable populations during periods of drought, which may include cash transfers, food assistance, and other forms of support.

Livelihood diversification: to reduce dependence on rainfed agriculture. This may involve introducing alternative income-generating activities that are less susceptible to drought impacts.

Capacity building: to provide training on the adoption of climate-resilient agricultural practices, water-efficient technologies, and sustainable land management.

Infrastructure development: to plan and oversee the construction of infrastructure projects that contribute to drought resilience. These may include water storage facilities, irrigation systems, and improved rural water supply networks.

Natural resource management: to implement strategies such as soil conservation, watershed management, and reforestation to contribute to ecosystem health and enhance resilience to drought.

Climate change adaptation: to integrate measures to address the long-term impacts of changing climate patterns and promote adaptive strategies.

Provincial, district and village-level agencies

APPLICABILITY	POTENTIAL CRITICAL ROLES IN DROUGHT MANAGEMENT
Fundamental for countries with regional differences in drought risk due to climatic and socioeconomic heterogeneity, and those with a decentralized governance structure (especially large countries). Such institutions are involved in drought management in most countries, including Argentina, Ghana, Ukraine and Zambia.	**Planning and implementation of localized strategies:** to adapt national drought policies to the unique circumstances of their provinces or communities, considering local environmental, socioeconomic and cultural factors. They facilitate the development and execution of drought preparedness plans, ensuring that resources are efficiently utilized to mitigate risks and enhance resilience at the grassroots level. **Communication, education and public awareness:** to engage communities in drought-related initiatives and foster a collaborative approach to sustainable water resource management. Through their direct involvement, the provincial and community-level, agencies contribute to building local capacity, enhancing adaptive measures, and promoting a more effective response to drought. **Data collection:** to collect ground-truth data on drought risk and impact. Through working directly with communication officers, the agencies can collect, manage and distribute data that can be used for the planning and implementation of drought plans.

Organizations for indigenous people, minorities or other vulnerable groups

APPLICABILITY	POTENTIAL CRITICAL ROLES IN DROUGHT MANAGEMENT
Fundamental if the country has such a department or organization. Institutions dedicated to indigenous peoples' or minorities' affairs are present in countries with diverse populations where certain societal groups face or live with a history of social, economic, political and cultural marginalization or discrimination. Examples include Argentina, Guyana, Honduras and Paraguay.	**Advocacy of all-inclusive policies:** to ensure that the specific needs and perspectives of underrepresented people are integrated into drought response and mitigation. They also work to enhance universal access to resources, education and skills that can improve water management, agricultural practices and community preparedness. **Vulnerability, impact assessment and targeting strategies:** to support the development of rigorous vulnerability and impact assessment, and contribute to the definition of targeting strategies of drought policies, strategies, plans and investments. They have primary data on the most vulnerable community members, thus supporting the equal and fair distribution of benefits. **Integration and preservation:** to ensure recognition of and respect for the unique needs and perspectives of indigenous communities. It focuses on integrating traditional knowledge and practices into drought resilience strategies, acknowledging the close connection between indigenous peoples and their environments. The department collaborates with indigenous communities to develop culturally sensitive drought preparedness and response plans, ensuring the inclusion of traditional water management practices and sustainable land use approaches. By prioritizing the voices and contributions of indigenous peoples, the organization fosters community resilience, preserves cultural heritage, and promotes equitable and effective drought management strategies that align with the specific challenges faced by indigenous populations.

Non-governmental organizations (NGOs)

APPLICABILITY

Strongly recommended for countries with limited resources and institutional capacity to address drought risks; those with vulnerable populations, and those that apply participatory approaches to natural resource management. These institutions are involved in most countries' drought planning and management, including in Cambodia, Honduras, Somalia and Zimbabwe.

POTENTIAL CRITICAL ROLE IN DROUGHT MANAGEMENT

Active community engagement: they work on the ground, collaborating with communities to implement sustainable water resource projects, promote efficient agricultural practices, and enhance local resilience to drought impacts. NGOs contribute to awareness campaigns, education initiatives and capacity-building programmes, empowering communities to adapt to changing climatic conditions. They often provide humanitarian aid during drought emergencies, delivering essential resources such as food, water and medical assistance to affected populations.

International and technical support agencies

APPLICABILITY

Strongly recommended in countries that rely on official development assistance and technical support agencies for mitigation measures, or require international assistance to counteract fragility-related risks. These countries include Somalia, Sudan and Ukraine.

POTENTIAL CRITICAL ROLES IN DROUGHT MANAGEMENT

Specialized technical support: to design and implement specialized programmes that contribute to drought resilience based on a set of environmental and social safeguards. Specialized technical support spans a multitude of sectors, societies and systems, which are vulnerable to drought.

Technical solutions: to pilot and implement technologies, approaches and methods that prove effective to build resilience. They develop technical solutions that suit the specific needs of communities vulnerable to drought.

Investment catalyst: to de-risk investment by providing tested solutions and assisting the development of investment design and resource mobilization.

Affected sectors

Ministry of health

APPLICABILITY

Fundamental where previous droughts have had negative impacts on health or where future droughts are anticipated to create health concerns. Example countries that incorporate the ministry of health include Azerbaijan, Panama, the Philippines and Sudan.

POTENTIAL CRITICAL ROLES IN DROUGHT MANAGEMENT

Emergency response planning: to develop and implement emergency response plans for health-related crises triggered by drought.

Surveillance and early warning systems: to generate timely information on emerging health risks associated with drought, thus, allowing for proactive responses and the protection of public health.

Healthcare infrastructure and services: to address increased health risks during drought by maintaining and enhancing healthcare infrastructure in affected areas, including ensuring the availability of medical facilities, essential medicines, and healthcare personnel to respond to potential health emergencies.

Nutritional support: to implement programmes, especially for vulnerable populations such as children and pregnant women, to mitigate food shortages during drought.

Waterborne disease prevention: to work to prevent waterborne diseases that may arise due to compromised water quality during droughts, by ensuring access to safe drinking water, promoting hygiene practices, and conducting public awareness campaigns.

Vector-borne disease control: to implement control measures to manage the spread of diseases transmitted by vectors like mosquitoes, reducing the risk of outbreaks and ensuring public health.

Mental health support: to provide mental health services, counselling and support programmes to address the psychological well-being of individuals and communities affected by drought-related stress, uncertainty and socioeconomic challenges.

Community education and awareness: to educate communities on health risks related to drought and promote preventive measures such as conducting awareness campaigns, disseminating health information, and empowering communities to adopt health-promoting practices.

Research and data collection: to understand the health impacts of drought by collecting data on health indicators in drought-affected regions that would inform evidence-based policies and interventions for better health outcomes.

Capacity building: to prepare and design training programmes to ensure that individuals at various levels are equipped to effectively address health challenges associated with drought.

Ministry of energy

APPLICABILITY

Fundamental for countries dependent on hydroelectric power or where the water sector depends on access to energy. Examples include Burundi, Eswatini, Honduras and Panama.

POTENTIAL CRITICAL ROLES IN DROUGHT MANAGEMENT

Contingency plan preparation: to promote and implement energy efficiency measures; to develop diversified, alternative and renewable energy sources; and to ensure a reliable energy supply even in water-stressed conditions. During periods of drought, water scarcity can affect traditional energy sources such as hydropower and cooling of thermal power plants.

Control of energy demand peaks: to provide strategies for fair and equitable access to energy in drought periods by controlling the market patterns and peaks, e.g. energy use for groundwater-lifting can be scheduled based on the priority orders.

Incentive schemes: to create incentives for the use of alternative energy sources during peak demands in drought periods, thus ensuring undisrupted energy supply even if the demand exceeds the system capacities.

Contribution to the development of water allocation scenarios: to participate and contribute to the preparation of water allocation plans in water-stressed conditions, including the development of water demand optimization through minimum trade-off.

Ministry of public works and infrastructure

APPLICABILITY

Strongly recommended for all countries where infrastructure development – for example, increased water storage capacities, irrigation system development, etc. – is identified as a principal mitigation measure. This ministry is involved in Botswana, Ghana and Sierra Leone, among other countries.

POTENTIAL CRITICAL ROLES IN DROUGHT MANAGEMENT

Designing and implementing rural infrastructure: to develop relevant infrastructure, such as water transfer and storage systems to improve resilience to drought. It can indicate the implementation schedule of infrastructure projects by giving priority orders to vulnerable areas, where infrastructure development can improve coping capacities.

Developing resilient infrastructure: to provide solutions to resilient infrastructure that can withstand drought impacts. Guidelines can enhance the integration of social and environmental safeguards in the infrastructure designs, which, in turn, are prepared to mitigate drought impacts. As a result, the longevity of the infrastructure can be improved.

Department of forestry

APPLICABILITY

Fundamental for countries with forest-dependent communities and economic sectors and/or significant forest cover. However, where the ecosystem functions of forests are concerned, this role is often covered by the ministry of the environment, and the department of forestry may deal more with commercial forestry. Examples include Cambodia, the Dominican Republic, Honduras, and the Republic of Moldova.

POTENTIAL CRITICAL ROLES IN DROUGHT MANAGEMENT

Prioritizing conservation and restoration of forest ecosystems: to contribute to water retention, soil moisture regulation, and overall environmental resilience during periods of drought. Forests act as natural buffers against water scarcity by preserving watersheds, reducing runoff, and enhancing groundwater recharge. The department is responsible for implementing afforestation and reforestation initiatives, promoting agroforestry practices, and raising awareness about the critical role of forests in maintaining ecological balance.

Preventing wildfire: to conduct regular assessments of fire-prone areas, implement firebreaks, and develop early warning systems. The department is responsible for enforcing regulations related to controlled burns and fire safety, as well as educating the public about responsible fire practices.

Fire department

APPLICABILITY

Strongly recommended for countries that face increased risk of wildfires during droughts, particularly those with dry climates, extensive forests, urban–wildland interfaces, and/or fire-related infrastructure vulnerabilities. Examples include Ghana, Grenada, Guyana and the Republic of Moldova.

POTENTIAL CRITICAL ROLE IN DROUGHT MANAGEMENT

Wildfire prevention, detection and suppression: to implement proactive measures such as creating firebreaks, conducting controlled burns, and educating the public about fire safety practices. During drought-induced wildfires, the fire department leads emergency response efforts: it mobilizes firefighting resources, coordinates with other agencies, and evacuates communities when necessary. Its role encompasses not only immediate fire control but also post-fire recovery and rehabilitation efforts to mitigate long-term environmental and societal impacts.

Department of transportation

APPLICABILITY

Fundamental for countries where droughts affect transportation infrastructure, logistics and mobility. There are few examples in the national drought plans developed as part of UNCCD's Drought Initiative, though an obvious example with global implications is Panama.

POTENTIAL CRITICAL ROLES IN DROUGHT MANAGEMENT

Development of contingency plans: to anticipate and mitigate the potential disruptions for transportation infrastructure in regions prone to drought.

Coordination of transportation networks: to facilitate the timely delivery of water food, and emergency supplies to drought-affected areas.

Development of trade forecasts: to monitor the hydrological drought and its propagation to forecast its impact on the navigation. It is responsible for preparing contingency plans for undisrupted trade flows.

Development of plans for public transport: to provide alternative means of public transport for communities that depend on navigation.

Department of fisheries

APPLICABILITY

Fundamental for countries where droughts affect aquatic ecosystems, fisheries resources and the livelihoods of fishing communities. Examples include Guyana, Mali, Togo and Zambia.

POTENTIAL CRITICAL ROLES IN DROUGHT MANAGEMENT

Addressing the impact on aquatic ecosystems and fisheries-dependent communities: to focus on sustainable water use practices and ensure the conservation of aquatic habitats during drought conditions. The department collaborates with stakeholders to develop strategies for maintaining water quality and preserving critical habitats for fish species. It engages in public awareness and education initiatives to promote responsible water use and protect vulnerable fish populations.

Monitoring impact: to monitor the impact of drought on natural fish habitats and conduct an inventory of the losses. It maintains a registry of the fish population, health, condition, and reproductive patterns during drought periods.

Conducting public awareness and education: to develop awareness programmes and conduct capacity building for communities on mitigation measures, such as restricted fishing during drought periods. It educates the public on the harmful impact of fishing on affected aquatic ecosystems.

Tourism board

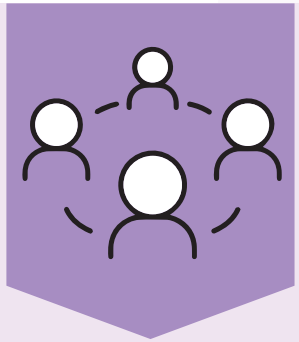
APPLICABILITY

Strongly recommended for countries with tourism-dependent economies, especially water-intensive tourist complexes, nature-based tourism, and water-dependent attractions such as rivers, lakes and waterfalls. Examples include Botswana, Gambia, Grenada and Tunisia.

POTENTIAL CRITICAL ROLES IN DROUGHT MANAGEMENT

Promotion of water conservation initiatives within the tourism sector: to raise awareness among visitors and local businesses about responsible water usage and to implement drought-resilient tourism strategies. By collaborating with relevant stakeholders, it can contribute to minimizing the environmental impact of tourism activities during drought conditions, ensuring the long-term sustainability of the destination. The tourist board may play a role in crisis communication, providing accurate information to tourists about drought conditions and recommending responsible behaviors to minimize their ecological footprint.

Assessment of water footprint: to assess the water use of the tourism sector and its impact on water availability. It provides recommendations on water allocation policies during drought periods.



Private sector

APPLICABILITY

Strongly recommended for countries with water-intensive industries (e.g. agriculture, food and beverage production, manufacturing, mining, and energy production) that are particularly vulnerable to water scarcity and drought impacts, which can disrupt operations, increase production costs, and affect supply chains. Also for countries with privatized infrastructure and transportation, with insurance and risk management sectors and with innovation and technology sectors.

POTENTIAL CRITICAL ROLES IN DROUGHT MANAGEMENT

Capacity for innovation, resource mobilization and implementation of sustainable practices: to invest in water-saving technologies, develop drought-resistant crops, and adopt efficient water management strategies to reduce their water footprint. Businesses can collaborate with communities and government agencies to support drought relief efforts by providing financial resources, donating supplies, or offering logistical support. The private sector can contribute to raising awareness about water conservation and drought resilience among employees, customers and stakeholders, fostering a culture of environmental stewardship and resilience.

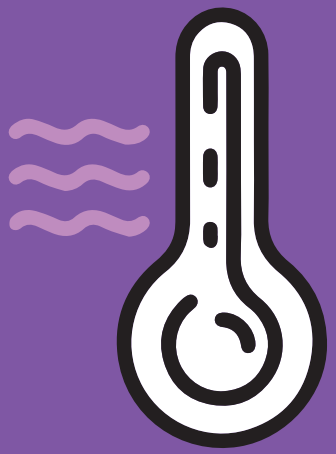
Insurance and risk management: to enable the development of drought insurance schemes, parametric insurance products, and disaster risk financing mechanisms that provide financial protection, incentivize risk reduction measures, and promote resilience-building investments in drought-prone areas.

Harnessing of digital technologies, data analytics and remote sensing capabilities: to leverage private sector expertise and investment in technology-driven solutions, for example, through the development of innovative tools, software applications, and information systems that enhance drought preparedness, response coordination and adaptive management practices.

Innovation in drought management: to develop and disseminate innovation that responds to different contexts of drought risk. Businesses develop marketable products that can be taken to the market.

Household-level mitigation: to implement drought mitigation measures within the capacities of households. Households have a substantial but often unrecognized investment in resilience-building measure. They also have a significant contribution to the coping capacities. Fostering household-level actions can encourage and incentivize communities to make private investments.

High risk of natural hazards



National disaster risk management or climate change agency

APPLICABILITY

Fundamental if the country has such an agency or agencies. These institutions are often established in countries that frequently suffer various natural hazards. Examples include Cambodia, Ghana, Grenada, the Philippines and Somalia.

POTENTIAL CRITICAL ROLES IN DROUGHT MANAGEMENT

Ensuring complementary actions: to prevent duplicate or contradictory plans and actions. They ensure the integration of drought management efforts into the broader context of disaster risk reduction and climate change adaptation, aligning efforts with national and international frameworks for disaster risk reduction and climate resilience.

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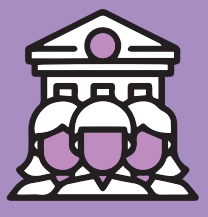
Hosting institutional framework: to provide an integrated institutional platform for disaster risk management. They can fully or partially integrate drought risk management functions in terms of institutional infrastructure and coordination mechanism, particularly in countries with multiple and simultaneous disasters.

Aligning adaptation efforts: to find synergies between climate change adaptation and drought risk mitigation measures, thus making the actions and investments more resource-efficient.

Complementing climate research with ground-truth data: to support the research work on climate change and its role in the intensification of drought events. They usually maintain inventories and datasets on risk and impacts, which can be used in drought management.



Ministry of the interior or of civil or public protection

APPLICABILITY

Fundamental for countries facing internal security challenges, running complex administrative structures due, for example, to diverse populations (e.g. divided by ethnicity or religion), or grappling with terrorism, insurgency, organized crime or civil unrest. Examples include Algeria, Benin, the Philippines and Serbia.

POTENTIAL CRITICAL ROLES IN DROUGHT MANAGEMENT

Coordinating emergency response measures: to develop and implement evacuation plans, establish emergency shelters, and ensure the safety and well-being of affected populations during drought conditions. The ministry collaborates with various agencies to enforce water conservation measures, manage public awareness campaigns, and maintain law and order in regions affected by drought. It may be involved in organizing resources for relief efforts and providing support services to communities facing water shortages.

Promoting social protection: to support the work of institutions responsible for operating social protection schemes. It oversees emergency operations to ensure the orderly delivery of early actions.

Ministry of education

APPLICABILITY

Strongly recommended for countries with a high risk of drought, water scarcity, and climate change. Examples include Algeria, Benin, the Dominican Republic and Sudan.

POTENTIAL CRITICAL ROLE IN DROUGHT MANAGEMENT

Fostering awareness, knowledge, and preparedness within educational systems: to integrate drought-related and climate change curricula into schools and educational programmes, ensuring that students and educators are well-informed about the impacts of drought and the importance of water conservation. Additionally, the ministry contributes to community resilience by promoting educational campaigns that disseminate information on drought mitigation strategies, sustainable water use, and environmental stewardship. An aim is to harness the transformative power of education in building resilience, promoting sustainable development, and safeguarding the well-being of present and future generations.

Ministry or department of communication

APPLICABILITY

Fundamental (if present in the country) for countries with drought emergencies, agricultural economies, water scarcity challenges, and/or vulnerable populations. Examples include Colombia, Honduras, Mali and Zimbabwe.

POTENTIAL CRITICAL ROLE IN DROUGHT MANAGEMENT

Facilitating effective communication: to coordinate communication efforts to ensure a unified and clear message regarding the severity of the situation, available resources and recommended actions. This includes utilizing various media channels, such as press releases, social media and public service announcements, to convey important updates, warnings and guidelines. The communication efforts aim to enhance public awareness, promote behavioral changes that conserve water resources, and facilitate a coordinated response from communities.

Research, innovation and collaboration

Universities and research institutes

APPLICABILITY

Strongly recommended for all countries aiming for comprehensive, science-based approaches to drought management. These institutions are involved in most countries' drought planning and management, such as Eswatini, Montenegro, Sri Lanka, and Ukraine.

POTENTIAL CRITICAL ROLES IN DROUGHT MANAGEMENT

Conducting locally relevant drought research: to deepen understanding of drought dynamics, climate change impacts, and water resource management.

Contributing innovative solutions: to develop and improve early warning systems, provide education and training programmes in relevant fields, facilitate the transfer of knowledge and technology, contribute to policy development, and engage in community outreach to enhance drought resilience at all levels.

Impact assessment: to conduct rigorous impact assessments of drought programmes, based on scientific methodologies. They often support the enhancement of governmental programmes with conclusions and recommendations from the impact assessments.

Ministry of foreign affairs

APPLICABILITY

Strongly recommended in countries that are members of transboundary or regional collaborations to manage drought, for example through joint monitoring and early warning, or transboundary water management strategies, such as Benin, Guyana, and Eswatini.

POTENTIAL CRITICAL ROLES IN DROUGHT MANAGEMENT

Maintaining regional or international cooperation: to establish and oversee the implementation of joint, regional, or international strategies for drought management. It is often mandated to coordinate shared infrastructure such as regional monitoring and early warning systems.

Importing knowledge and technology: to identify international partners for knowledge and technology exchange. It assesses and permits the knowledge exchange and technology import based on domestic regulations

Source: Author's own elaboration.

5 Analysis of approaches for the institutional coordination of drought management

5.1. Taxonomy of institutional coordination models

Within the national drought plans prepared as part of the UNCCD's Drought Initiative, there are certain models, mechanisms or approaches to institutional coordination that countries have developed. A taxonomy of these different models is presented here.

There is no one-size-fits-all institutional coordination model because different country contexts dictate which model may be most appropriate. These "country contexts" refer to climate (in particular, the frequency of drought), existing related initiatives, and the models that they use for institutional coordination, government type and structure, available human and financial resources, country size and amount of decentralization, types of drought impact and other natural hazards experienced, culture, proximity to or relationship with a country already applying one of the models, among other factors.

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For example, a country that experiences frequent natural hazards may already have an institutional coordination approach in place for dealing with those hazards, which can be adapted to drought. This describes the cluster model used by the Philippines. In contrast, countries with little experience of drought may prefer to select a simpler, more straightforward approach to get started – such as the three pillars model used by Sierra Leone – and may want to learn from other countries and literature Likewise, some approaches, such as the standing committee model with its subnational branches used by Argentina, are better suited to large heterogeneous countries while others, such as the technical working group model used by the Republic of Moldova, are more appropriate for small countries where it is convenient to centralize governance.

Several models can be prescribed to only come together in case of an upcoming or existing drought and meet sporadically in the meantime. This approach is applicable to countries where droughts are rare and impacts are limited. Such an approach is facilitated by utilizing simpler and less costly – in terms of financial and human resources, and mobilization effort – models, such as the technical working group approach applied in Guyana or the interinstitutional approach used by the Dominican Republic. Conversely, for drought-prone countries, permanent standing committees have higher operational costs, yet their continuous drought preparedness and mitigation actions would prove more cost-effective than reconvening a drought commission and working groups so frequently. Such permanent standing committees are a feature of several country approaches, including the standing committee approach in Argentina and the functions approach of Tunisia.

All the models revolve around a drought commission and involve the office of a high-ranking minister. The taxonomy thus further emphasizes the importance of this aspect of institutional coordination, which is step 1 of the IDMP ten-step template for action. The technical working group approach may appear to be an exception without a drought commission, but actually, the whole technical working group can be considered a drought commission.

The taxonomy in Figures 7–14 describes each model and suggests its applicability based on the analysis of national drought plans. Example countries that utilize the particular models are also provided. The subsequent subsections further describe the different models and show the particular institutions involved and their roles in drought management (for selected countries). The full list of involved ministries, departments and other institutions is often included in the country case studies (Section 5.4) to link to the minimum institutional framework in Section 4 and to fully illustrate the requirement for comprehensively incorporating all institutions relevant to drought. For some models, several examples are provided to highlight that a model can be tailored to a specific country context.

It is important to note that there can be variations in how different countries apply the same model, especially in terms of what institutions and how many working groups or subcommittees are involved, and what they focus on. Some models are quite similar, almost subtypes (e.g. the taskforce and subcommittee model and the three pillars model), while others overlap, incorporating aspects of other models within their approach. Notably, it is possible to combine models, as will be illustrated by the examples of Benin (standing committee and functions approach), Tunisia (standing committee, functions and cluster approach), and Grenada (three pillars, cluster and phases approach). Therefore, the illustrated models are a guide with an expectation of contextualization by the adopting country.

What is more, there are increasingly more countries where a permanent, institutionalized drought agency operates as a department or division of a ministry, for example. This represents the strongest form of coordination and could be applicable to most of the institutional coordination models. In these cases, the drought commissions shown in the model structures represent this permanent drought agency.

Cluster approach

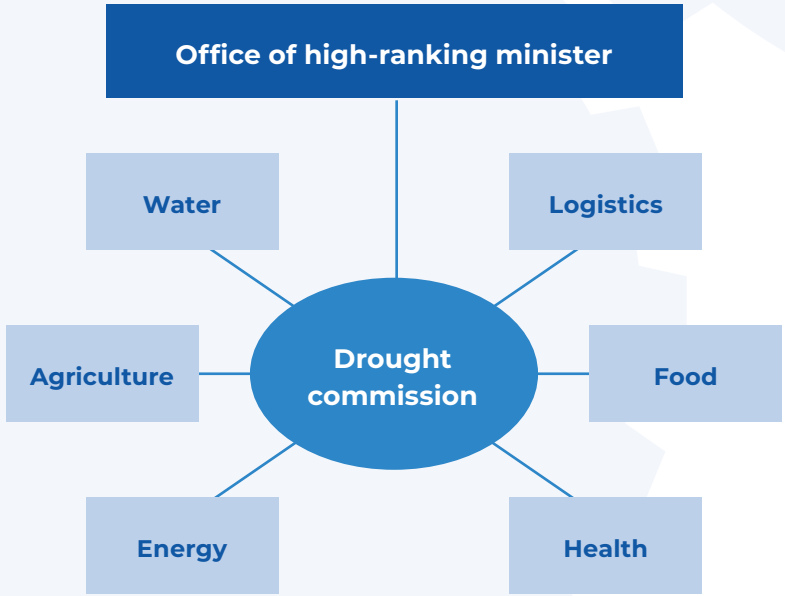
DESCRIPTION Working groups are designated into clusters according to the affected sector, e.g. agriculture, water, food, health, etc. Relevant institutions may have representatives in multiple clusters. Each cluster has roles and responsibilities during all phases of drought and relating to all three pillars.

APPLICABILITY Applied in countries that experience various natural hazards, including drought. The clusters and overseeing commission may be already established for other disasters.

EXAMPLES

Eswatini, Honduras, the Philippines, Somalia, Togo

FIGURE 7. THE CLUSTER APPROACH FOR DROUGHT MANAGEMENT INSTITUTIONAL COORDINATION



Source: Authors' own elaboration.

Standing committee approach

DESCRIPTION A vertically aligned approach with a permanent high-level committee anchored to upper levels of government above regional (subnational) and local committees. Relevant institutions are present in each committee, dependent on the scale at which they operate.

APPLICABILITY Appropriate for countries that regularly suffer from drought with hierarchical governance structures, as well as large countries due to the designated subnational committees.

EXAMPLES

Argentina, Benin, Cambodia, Ghana, Zimbabwe

FIGURE 8. THE STANDING COMMITTEE APPROACH FOR DROUGHT MANAGEMENT INSTITUTIONAL COORDINATION

Source: Authors' own elaboration.

Technical working group approach

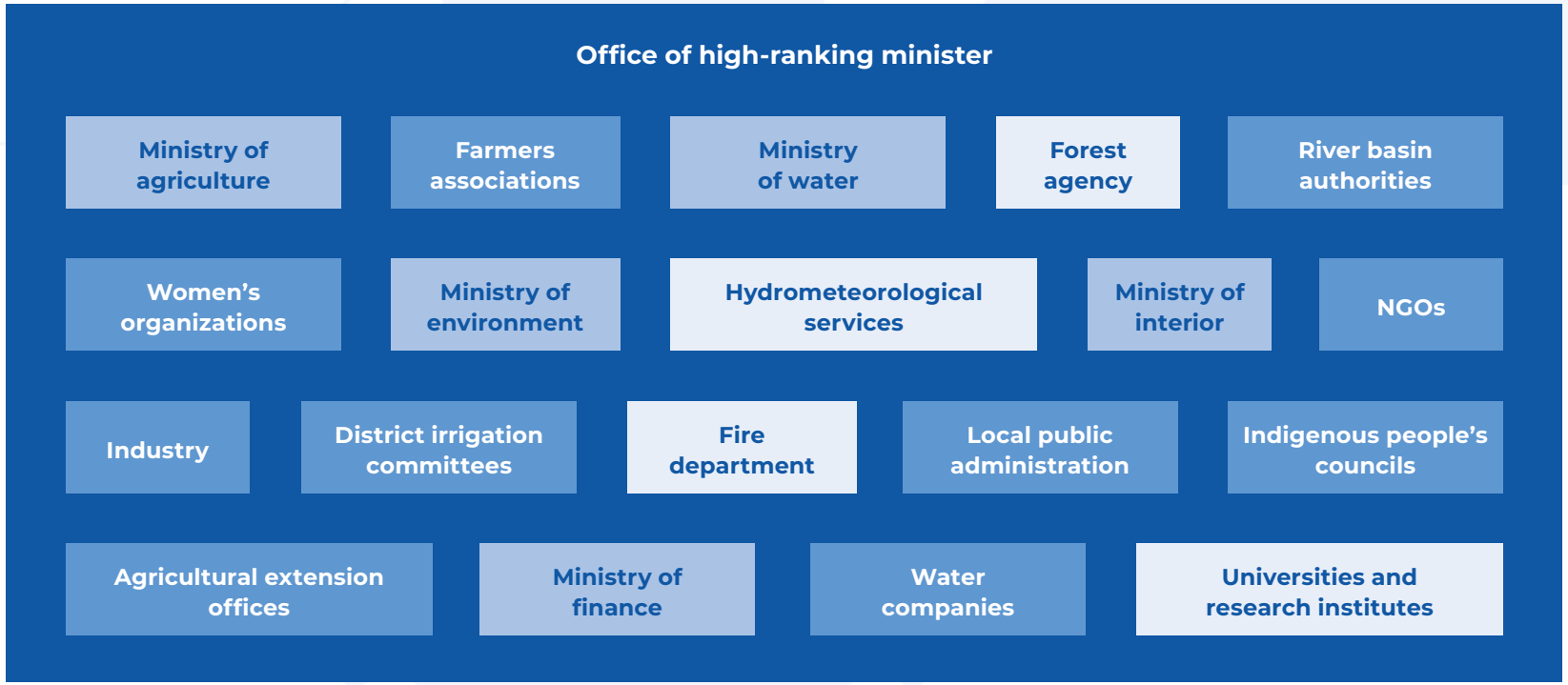
DESCRIPTION A single working group incorporating representatives from ministries, departments, technical and research institutions, the private sector, and civil society on all scales and levels.

APPLICABILITY Suitable for smaller countries, in terms of available human resources and geographic area, with centralized governance.

EXAMPLES

Azerbaijan, Guyana, Liberia, the Republic of Moldova, Sri Lanka

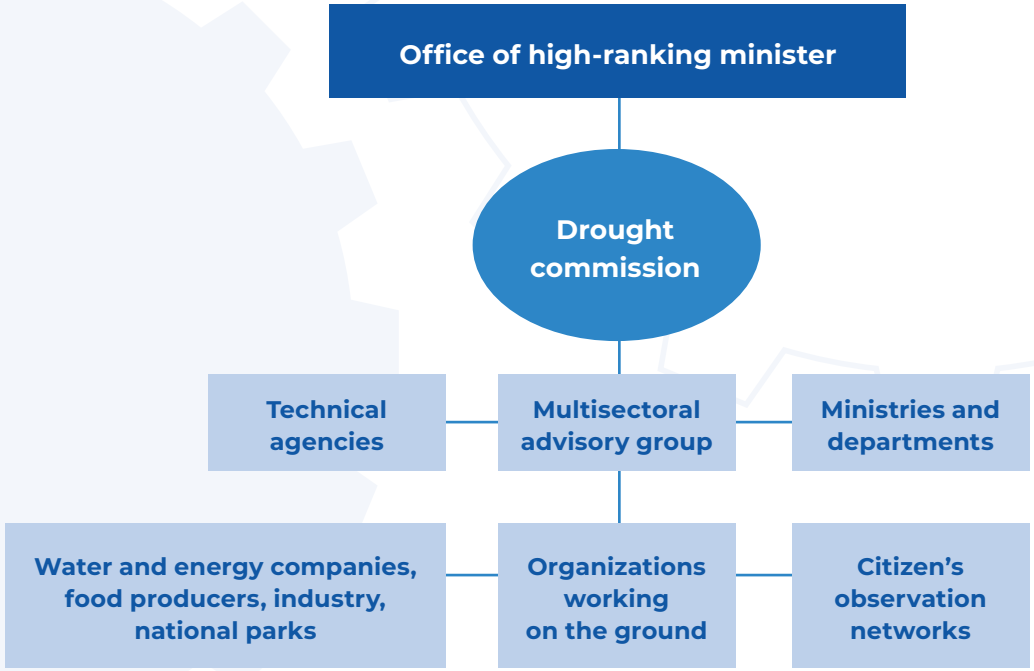
FIGURE 9. THE TECHNICAL WORKING GROUP APPROACH FOR DROUGHT MANAGEMENT INSTITUTIONAL COORDINATION



Source: Authors' own elaboration.

Interinstitutional approach	DESCRIPTION	APPLICABILITY	EXAMPLES
	A vertically aligned approach with a high-level decision-making authority above a multisectoral advisory group above organizations working on the ground.	Appropriate for countries with established monitoring and data provision institutions and networks with good coordination.	Colombia, the Dominican Republic, Mali, Montenegro, Ukraine

FIGURE 10. THE INTERINSTITUTIONAL APPROACH FOR DROUGHT MANAGEMENT INSTITUTIONAL COORDINATION



Source: Authors' own elaboration.

Taskforce and subcommittee approach

DESCRIPTION

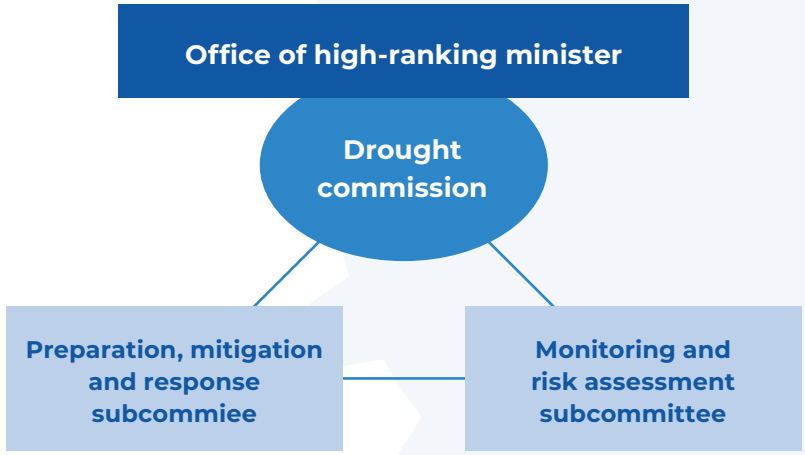
Conforming to UNCCD's Model National Drought Plan guidance with a drought taskforce overseeing two subcommittees dedicated to preparation, mitigation and response, and monitoring and risk assessment

APPLICABILITY A simple model that is useful for countries that may not have had or have little experience implementing drought or disaster plans and initiatives.

EXAMPLES

Algeria, Panama, Serbia, Zambia

FIGURE 11. THE TASKFORCE AND SUBCOMMITTEE APPROACH FOR DROUGHT MANAGEMENT INSTITUTIONAL COORDINATION



Source: Authors' own elaboration.

Three pillars approach

DESCRIPTION

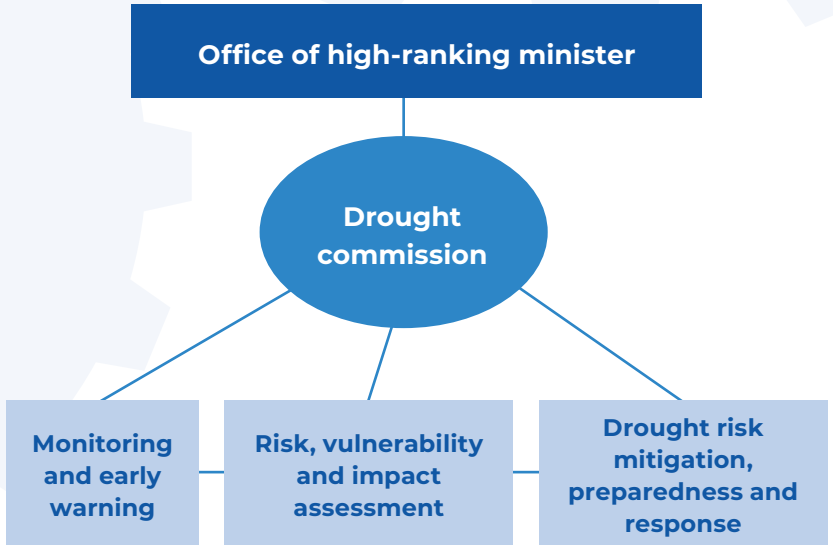
Multisectoral representatives form working groups that align with each of the three pillars of integrated drought management.

APPLICABILITY Useful for countries with little experience of drought because it is straightforward and maps directly onto available guidance about integrated drought management.

EXAMPLES

Grenada, Sierra Leone

FIGURE 12. THE THREE PILLARS APPROACH FOR DROUGHT MANAGEMENT INSTITUTIONAL COORDINATION



Source: Authors' own elaboration.

Drought phases approach

DESCRIPTION

Multisectoral representatives form working groups within a drought commission that align with each phase of drought (before, during, after).

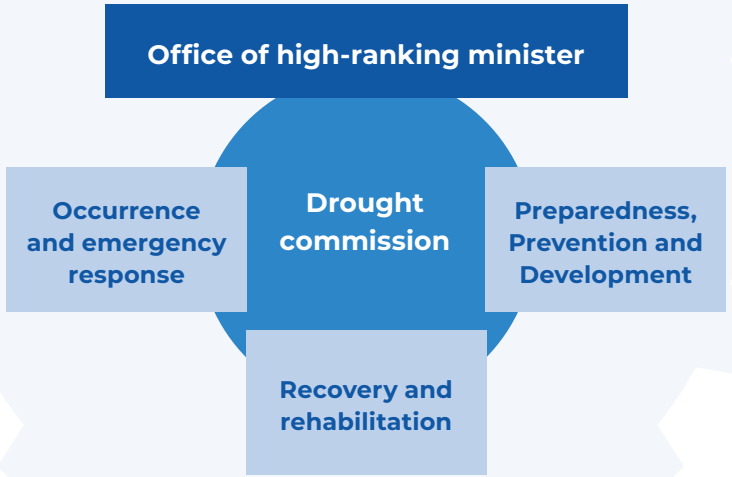
APPLICABILITY

It can potentially unite poorly coordinated and funded ministries, departments and agencies that have overlapping mandates.

EXAMPLES

Côte d'Ivoire, Sudan

FIGURE 13. THE DROUGHT PHASES APPROACH FOR DROUGHT MANAGEMENT INSTITUTIONAL COORDINATION



Source: Authors' own elaboration.

Functions approach

DESCRIPTION

A horizontally aligned approach with working groups that have a designated function, which is typically a role in drought management (e.g. communication, monitoring and early warning, evaluation, etc.). These functional working groups may contain clusters in accordance with the cluster approach.

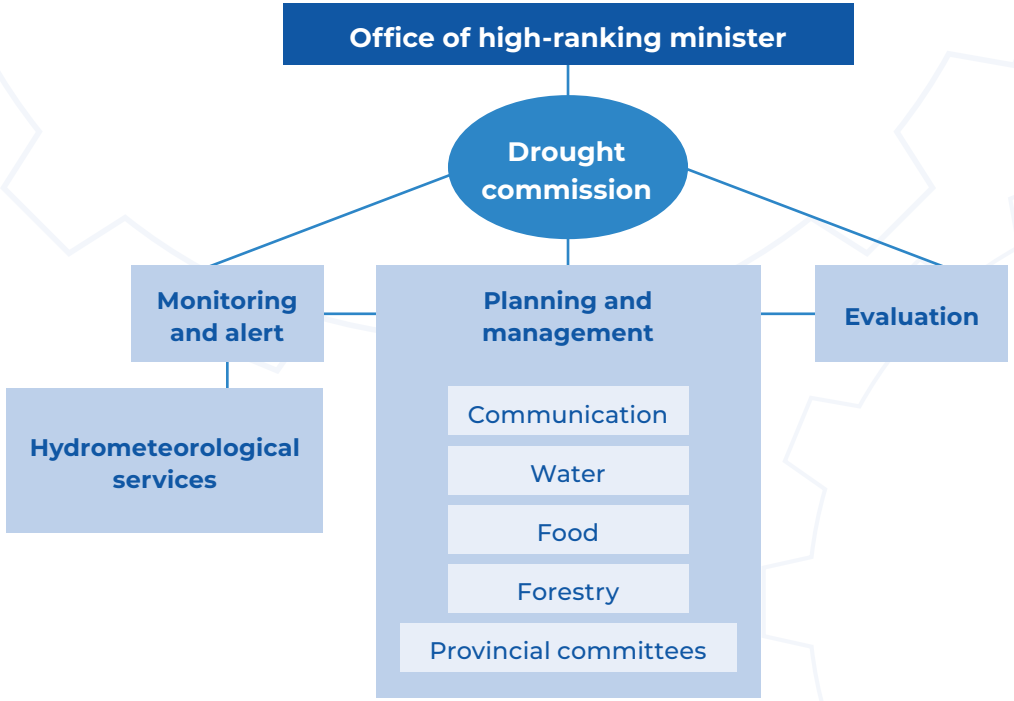
APPLICABILITY

It can potentially harmonize the actions of different institutions by focusing them on required management roles. Alternatively, the approach can leverage existing relationships between institutions with a history of working together.

EXAMPLES

Botswana, Burundi, Nigeria, Paraguay, Tunisia

FIGURE 14. THE FUNCTIONS APPROACH FOR DROUGHT MANAGEMENT INSTITUTIONAL COORDINATION



Source: Authors' own elaboration.

When choosing a suitable approach, two main aspects emerge: the temporal scale and the resource efficiency. The first aspect depends on the magnitude of drought risk (Section 5.2), while the latter determines the degree of independence of the coordination mechanism (Section 5.3).

5.2. Temporal considerations of the institutional coordination model taxonomy

The level of drought risk indicates the likelihood and frequency of activating and utilizing coordination mechanisms, or more precisely, the availability of the operating institutions. Countries with frequent and severe drought events may require permanent institutions to ensure continuous coordination. This is because operationalizing a coordination mechanism entails transaction costs, time for transition, and resource reallocation. On the other hand, countries with less frequent drought events may choose the coordination type by weighing the operating and opportunity costs of maintaining an institution. In theory, three types of coordination mechanisms can be differentiated based on the temporal scale: temporary, semi-permanent and permanent institutions. Nevertheless, it is important to recognize that certain drought management functions continue to operate even if temporary institutions are in place. For example, monitoring and early warning systems are continuously operational even if full-scale coordination is not required. Also, major investments in drought resilience, such as water infrastructure development, usually span beyond the cycle of a drought event. Institutional frameworks and the operated coordination mechanisms, technically, fall under the types of semi-permanent or permanent institutions. To avoid this conceptual interference, the term “temporary” is defined here as the ad hoc nature of the core decision-making body in the coordination mechanism, which is activated by drought risk for a specific period. Table 1 summarizes the potential temporal scales of the approaches.

5.3. Resource consideration of the institutional coordination model taxonomy

The degree of independence of a coordination mechanism often depends on the availability of resources. Above all, human expertise and financial resources are required to assemble a functional coordination mechanism for drought management. Beyond the general human resources roles, understanding drought requires further scientific development that linearly increases the need for the expansion of human expertise. Internalizing existing human expertise into the management cycle can significantly lower the upfront costs of establishing a coordination mechanism. For example, involving research institutions as core members of the coordination mechanisms can overcome this challenge. The other decisive factor is the financial resources or more specifically, the investment cost to establish a coordination mechanism; the fixed operating costs; the transaction cost of the operationalization; and the opportunity cost. These four cost types must be investigated together to understand the fiscal space for establishing and operating a coordination mechanism. Often, countries with more frequent and severe droughts cannot afford an independent drought institution and mechanism due to the required financial resources. The selection of coordination mechanisms must rest on a solid analysis of the resource efficiency by removing any duplication of functions and leveraging the available resources. For this reason, when selecting a coordination mechanism, it is important to determine the level of independence or integration with an existing institutional framework. Table 2 summarizes to what extent the coordination approaches can be integrated into existing institutions.

TABLE 1. ASSESSMENT OF THE COORDINATION APPROACHES IN VIEW OF THE TEMPORAL SCALE

Approach	Temporary	Semi-permanent	Permanent	Note
Cluster			X	The cluster approach, by mandate, is adopted to address multiple and frequent disasters. Therefore, it is assumed that readily available and permanent institutions and coordination are required.
Standing committee			X	A standing committee, by definition, is a permanent entity tasked to deal with drought.
Technical working group	X	X		Technical working groups integrate multiple institutions, but given the ad hoc nature of the selection of representatives, it is unlikely that such a mechanism will operate permanently. It rather gives the flexibility to change and adapt the composition to the specific drought event.
Interinstitutional	X	X		Like the technical working group, this approach is built on a bottom-up composition, with a multisectoral group involving the grassroots actors. Given this wide integration of stakeholders at all levels, permanent institutional frameworks are not suitable, specifically due to the nature of the on-ground stakeholders' responsibilities.
Taskforce and subcommittee		X	X	Although a taskforce or committee is, by nature, often associated with a specific and temporary task, the approach is built on the UNCCD's concept of proactive drought management that maintains the preparedness level even outside of drought periods, for example, through real-time drought monitoring systems. Therefore, this coordination approach requires continuous coordination and permanent institutions.
Three pillars		X	X	Similar to the taskforce approach, the three pillars approach is built on the UNCCD's concept, except that subcommittees are organized around the pillars. The maintained preparedness requires permanent institutions.
Drought phases	X	X		The approach follows the natural cycle of a drought event, from preparedness to recovery. As the subgroups are activated along the cycle, their operations are split into specific periods.
Functions		X	X	The approach is embedded into the functions of existing institutions, requiring minimal additional components for coordination. For this reason, the coordination mechanism becomes permanent.

Source: Authors' own elaboration.

TABLE 2. ASSESSMENT OF THE APPROACHES IN VIEW OF THE INTEGRATION INTO EXISTING INSTITUTIONAL FRAMEWORKS

Approach	Independent	Partly integrated	Fully integrated	Note
Cluster	X			Clusters are uniquely combined based on the impacts of multiple and frequent disasters. They include different sectors, stakeholders and sciences, which are thematically reorganized. Due to its cross-cutting and interdisciplinary structure under the leadership of a custom-built commission or team, the cluster approach is appropriate if an independent institutional and coordination structure is created.
Standing committee	X	X		The approach is built on the integration of vertical stakeholders, from local representatives to the highest level of authority, resulting in a unique structure. Inserting this structure into existing frames might compromise the functions and the decision-making process. Therefore, the implementation of this approach is appropriate if a certain level of independence is maintained.
Technical working group			X	The approach has no strong central and hierarchical coordination but rather relies on the contribution of sector-specific representation. This approach is appropriate if integrated into an existing institutional framework, thus providing a fixed structure to maintain the coordination flexibly but reliably.
Interinstitutional			X	The approach is largely decentralized, building on the contribution of grassroots actors. The ad hoc nature of the contribution by bottom-up entities requires a strong integration into existing institutional frameworks to oversee the coordination.
Taskforce and subcommittee	X	X		The approach establishes functions based on the drought management cycle. Therefore, this approach requires more independent frames to conduct the activities defined by the principles of integrated drought management. A stronger integration into existing frames might compromise the specific mandates under the function-driven committees.
Three pillars	X	X		Similar to the taskforce and subcommittee approach, this approach aligns the functions to the pillars of integrated drought management, thus requiring more independent frames to fulfil the specific mandates.
Drought phases		X	X	As functions are based on the cycle of a drought event, the operation of the function-driven working groups might be separated from each other. Therefore, strong supervision from existing institutions is required to harmonize the coordination.
Functions			X	The approach is built on the harmonization of existing functions, thus relying on the available institutional frameworks. Separating the coordination functions from these existing frameworks would essentially change the approach. Therefore, such an approach is suitable only if it is fully integrated into existing functions.

Source: Authors' own elaboration.

5.4. Case studies of the implementation of coordination approaches

5.4.1. Cluster approach

The cluster approach is often the model of choice for countries that must deal with various, sometimes simultaneous, natural hazards. The clusters and overseeing commission may already be established and iteratively developed for other disasters. Due to the overlap in preventing and alleviating the impacts of different hazards, applying the same approach to drought streamlines the process. The clusters, in most cases, relate to the sector affected by a natural hazard and each cluster has multiple contributing institutions and one lead institution. The overseeing commission delegates clusters' responsibilities of preparing, monitoring, communicating, responding and recovering from disasters as well as implementing risk reduction measures. Each cluster has a set of responsibilities and actions for each type of natural hazard. Clusters have ongoing responsibility for actions that reduce the risk of future droughts, as well as responsibilities during the various phases of a drought:

- monitoring, observing, and communicating drought as it arises;
- response activities during drought; and
- recovery as the drought abates.

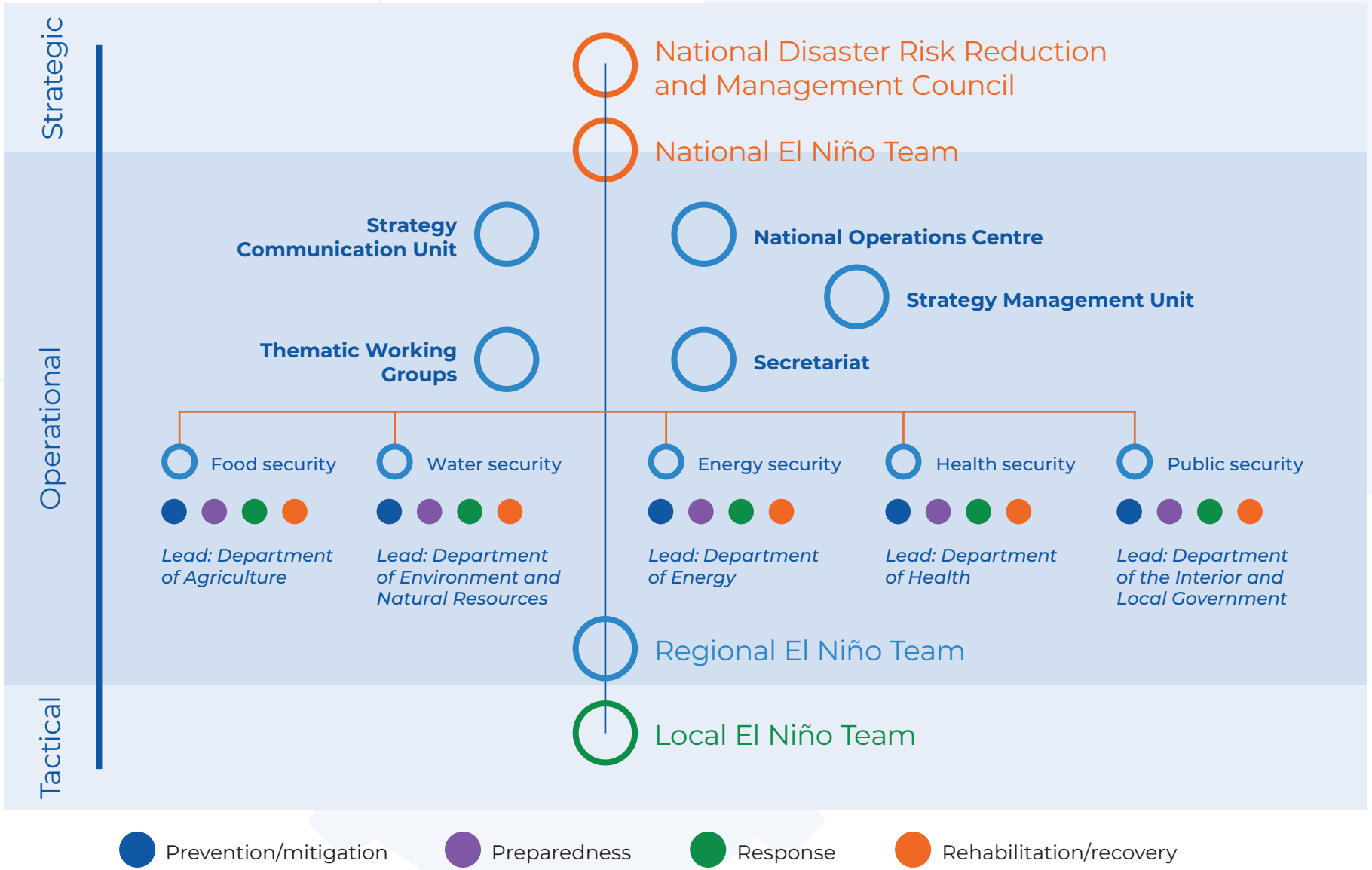
If it is to be newly established, the cluster approach involves reassembling institutions with sector-specific mandates to manage disaster risks. For example, all water institutions are pooled into one cluster to form a water security cluster. Even when clusters are based on sectors, some sectors, e.g. agriculture, are managed by many institutions, thus a new institutional architecture is needed that coordinates all these institutions towards the same objective. Therefore, if starting from zero, the cluster approach is demanding to establish.

The cluster approach is implemented in the Philippines to increase coordination among the Philippine government agencies when responding to natural hazards like cyclones, earthquakes and volcanic eruptions, in addition to droughts. Figure 15 shows the structure of the Philippines cluster approach and the composition of the National Disaster Risk Reduction and Management Council (NDRRMC), from which the clusters are formed.

Drought, along with other natural hazards, was previously managed by the Office of Civil Defense, the lead implementing arm of the NDRRMC with the primary mission of administering a comprehensive disaster risk reduction and management programme. The Office of Civil Defense is under the Secretary of National Defense or Department of National Defense. There is an ongoing transition into a new institutional structure, where the National El Niño Team becomes the operational arm of the NDRRMC. In addition, there are sectoral agencies that are accountable to the Vice-Chairperson and are tasked to lead the various phases of drought (prevention and mitigation, preparedness, response, and rehabilitation and recovery). Furthermore, several technical departments provide support based on their technical expertise. They include, among others, the National Water Resources Board, the Department of Agriculture, the National Irrigation Administration, the Bureau of Soils and Water Management, the Department of Environment and Natural Resources, and the Climate Change Commission.

The establishment of the National El Niño Team as an entity responsible for the translation of the policy into operation is a significant step towards the integrated management of disasters. The institutional structure is layered both vertically and horizontally. Regarding the horizontal layers, national coordination is decentralized into regional (subnational) and local coordination. The vertical clusters include the key sectors: food security, water security, energy security, health security and public security. The nationally conducted vulnerability and impact assessment confirmed that drought affects all key sectors in the Philippines; thus, integrating drought management measures into all sectors is important to mitigate the risks. Each key sector follows the same pillars of disaster management: prevention and mitigation, preparedness, response, and rehabilitation and recovery.

FIGURE 15. THE STRUCTURE OF THE CLUSTER APPROACH IN THE PHILIPPINES



Source: Authors' own 2023. based on Philippines. El Niño National Action Plan.

5.4.2. Standing committee approach

The standing committee approach is anchored on a high government level and vertically structured. This a model is adopted by countries that are regularly affected by drought, especially those with hierarchical centralized structures. However, the designated subnational committees operating at increasingly smaller scale makes this approach useful in large countries.

Ghana regularly experiences droughts that threaten agricultural production, water and food security, and hydropower generation. The same organizational structure has been used for many years to deal with drought, desertification, and sustainable land management. This avoids the situation of having various structures dealing with individual issues that may be related. The approach conforms to the national governance structure as there are four levels of control which involve committees at the national, regional, metropolitan, municipal, district and community levels. The Ghana Drought Commission has responsibility for the following:

- provision of full secretarial support;
- coordination and management of financial resources;
- collation and review of programmes and project proposals developed at the regional, district and community levels;
- preparation of progress and annual reports on implementation and dissemination to all relevant actors;
- coordination and participation in the development and implementation of national drought policies and programmes; and
- coordination of legal issues and links with other conventions, policies and development programmes.

The Ghana National Committee is technical in composition and has subcommittees with the following responsibilities:

- decision–making and coordination of activities at the national level;
- assignment and assessment of responsibilities to various institutions and stakeholders;
- approval of policies, budgets and interventions; and
- provision of technical support, monitoring, and evaluation of activities.

The Ghana Regional Committee is an interdisciplinary committee consisting of regional heads of several departments and organizations. The regional committee provides guidance and support to programmes developed at the metropolitan, municipal, district and community levels. The regional committee is responsible for developing and sourcing funds for regional programmes.

At the metropolitan, municipal and district levels, the authorities offer the best channel for involving people at the grassroots level. They form the level of government closest to the people and are best placed to reflect local concerns and priorities and develop and implement practical action programmes. Their main function is to assist in formulating local policies and programmes or enacting local bylaws to protect the environment.

The Ghana Community Committees are responsible for the identification of priority concerns that will help in the formulation of viable programmes on natural resource management and resilience building.

The coordination mechanism of Ghana is not yet fully in line with the concept of proactive drought management, as there is no planned and coordinated monitoring and management in place yet. The change can be implemented through the Drought Commission and the National Committee, but it should be mainstreamed through all levels.

Benin utilizes the standing committee approach for its National Platform for Disaster Risk Reduction and Adaptation to Climate Change. This institution, however, is not specific to drought. Below the national level, decentralized committees are chaired by prefects for departments or states and mayors for municipalities. They exist down to city district and village level, with local levels involving the local gendarmerie, International Federation of Red Cross and Red Crescent Societies, and NGOs. The committee at the department level is subdivided into functions as per the functions approach, covering agricultural production, communication, relief and assistance, care and prevention, and infrastructure.

FIGURE 16. ILLUSTRATION OF THE STANDING COMMITTEE APPROACH ADOPTED IN GHANA

Source: Authors' own elaboration based on Ghana. 2020. National Drought Plan.

It is reported that high-level multisectoral coordination is challenging, on the one hand, due to low motivation and the frequent change of appointment of focal points of sectoral ministries, and on the other hand, due to the lack of technical and financial capacities of the National Civil Protection Agency which acts as the permanent secretary. A noted difficulty of collaboration between the different ministries is due to their unwillingness to concede part of their power or work under the financial or technical dependence of other institutions.

Zimbabwe also applies the standing committee approach but in a much simpler framework. The vertical structure consists only of two entities. The Zimbabwe National Drought Council coordinates at the government level, develops policy and legislation, and accesses funding. It consists of the Civil Protection Unit, Ministry of Agriculture, Ministry of Environment, provincial officials, Agriculture Research and Extension Services, Meteorological Services Department, and the Zimbabwe Vulnerability Assessment Committee. The Provincial Level Drought Committee, at the local level, monitors, assesses and reports drought conditions and impacts. It also executes mitigation, preparedness and response actions while developing locally relevant strategies and projects. It comprises local representatives from the same institutions as the National Drought Council as well as other local stakeholders, such as from the private sector, NGOs and civil society groups.

5.4.3. Technical working group approach

The technical working group approach is commonly applied in smaller countries in terms of geographic area and available human resources where it is convenient to centralize governance. To avoid creating parallel structures, the drought planning process is implemented under the coordination and supervision of an existing national working group.

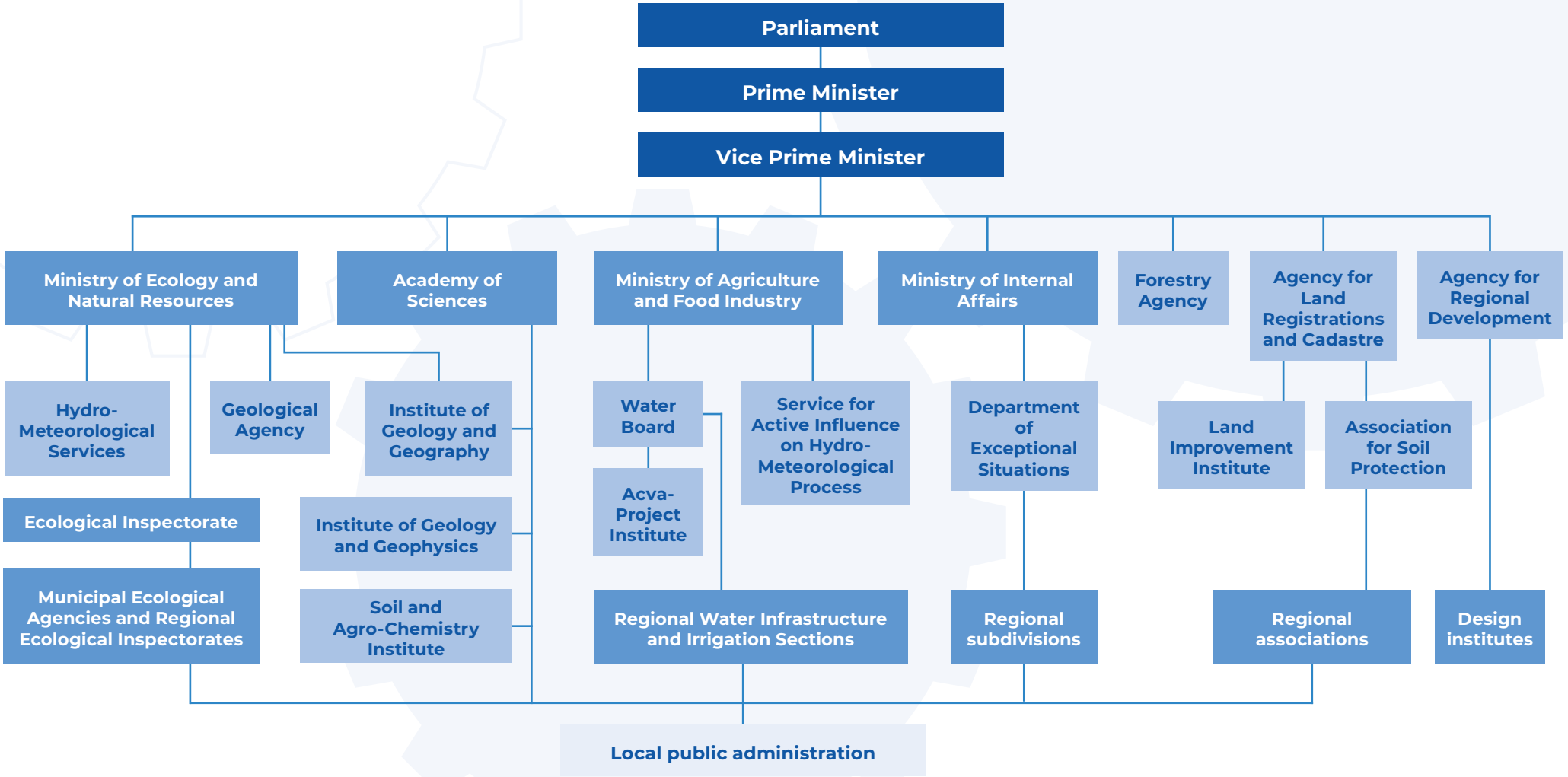
This model is utilized by the Republic of Moldova, which has a working group composed of multiple members delegated from various public and scientific institutions, and from economic and rural organizations. The working group carries out the overall coordination and monitoring of the National Drought Plan, as well as the preparation and presentation of reports to government agencies and the public. The involved institutions and their responsibilities are:

- A national commission headed by the prime minister and multiple local commissions headed by mayors act in emergencies. The emergency commissions create five-year preparedness and response plans and hold regular meetings to discuss, update and ratify these plans. District and local-level emergency planning is updated annually based on public consultations and data collected by the authorities. Coordinated emergency response exercises are carried out, on average, every five years. During emergencies, members of emergency commissions are notified immediately and meet to evaluate the level of threat to people, the economy and infrastructure, and agree on responses.
- The Ministry of Agriculture and Food Industry, the Ministry of the Environment, and the Ministry of Infrastructure and Regional Development with subdivisions concerned with water supply and use, soils, hydrometeorological monitoring and ecology act on preparedness actions. They develop water policy and action plans, monitor and manage water resources, promote agricultural practices to prevent land degradation, monitor weather and climate, and enforce ecological protection.
- The Ministry of Internal Affairs develops national legislation, policies and programmes in the area of emergency response and mitigation of natural and anthropogenic hazards.
- The State Forestry Agency develops forest management plans, policies, legislation and guidance materials, and designs afforestation and biodiversity improvement projects.
- The Academy of Sciences produces vulnerability assessments and maps.
- The Agency for Land Relations and Cadasters designs and implements soil conservation and improvement measures.
- The local public administration collects data and reports on hazards, plans and trains for emergencies, plans and coordinates recovery activities, raises drought awareness, and provides public warnings.

For similar reasons of a shortage in human resources, Guyana also applies this model. The National Drought Committee liaises directly with the Ministry of the Presidency and is chaired by the Civil Defense Commission. The committee, or technical working group, includes representatives of the following institutions:

- the Hydrometeorological Service responsible for monitoring and warning;
- Government Information Agency responsible for communication;
- Civil Defense Commission responsible for dissemination, preparedness and response;
- Guyana Lands and Surveys Commission;
- National Drainage and Irrigation Authority;
- Sea and River Defense Department;
- Guyana Bureau of Statistics;
- International Federation of Red Cross and Red Crescent Societies;
- Environmental Protection Agency;
- water users association;
- National Toshaos Council representing indigenous peoples;
- Women Across Differences representing women's organizations; and
- youth organizations.

FIGURE 17. ILLUSTRATION OF THE TECHNICAL WORKING GROUP APPROACH ADOPTED IN THE REPUBLIC OF MOLDOVA



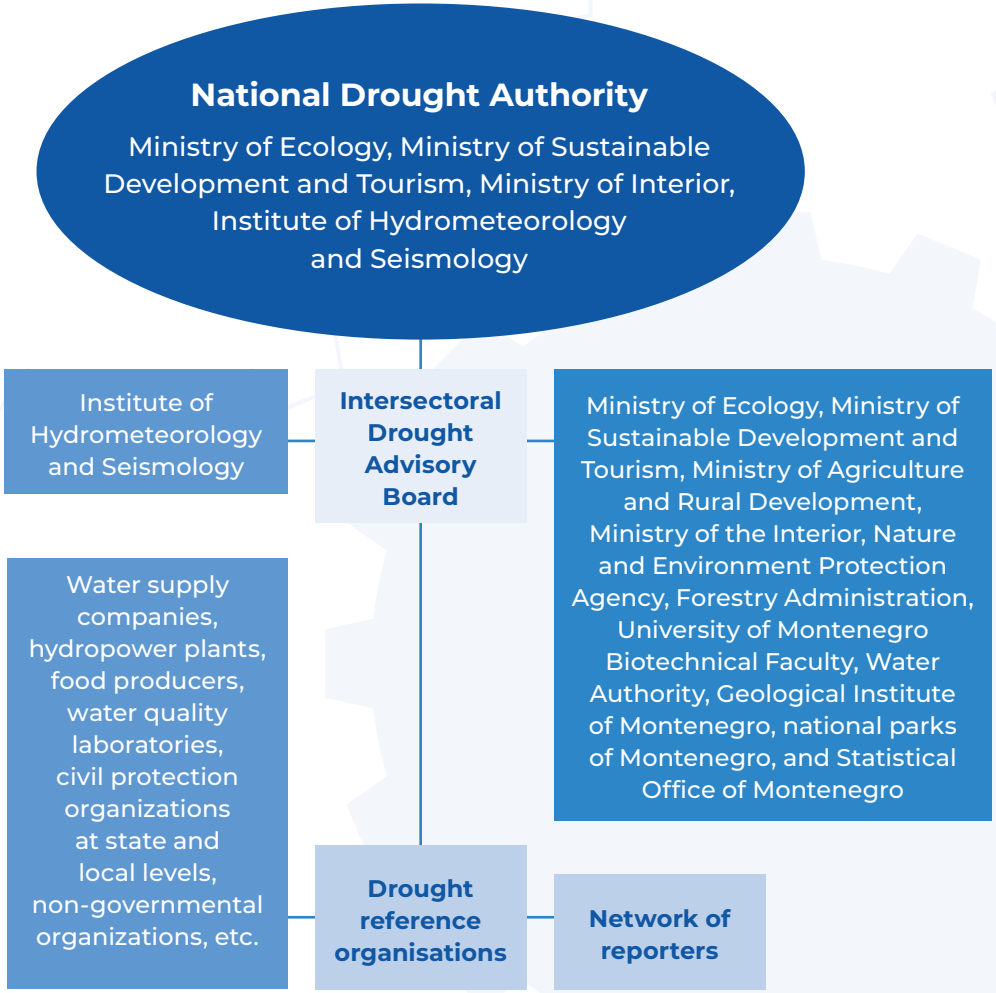
Source: Authors' own elaboration based on Republic of Moldova. 2020. National Drought Plan of the Republic of Moldova.

5.4.4. Interinstitutional approach

The interinstitutional approach is commonly applied by countries that already have good coordination and communication between institutions, especially those countries with established monitoring and data provision institutions and networks. This model is exemplified by Montenegro with its three levels:

- The National Drought Authority represents the leading authority for drought-related policies and overall supervision over issues related to drought management. As the leading authority, it enables political support and a coordinated legal approach to all necessary actions – recommended and agreed upon by the Inter-sectoral Drought Advisory Board – and provides necessary administrative support for funding of project implementation. It also serves as technical support for project preparation and enables smooth communication with international organizations as potential financiers. The National Drought Authority is legally empowered to declare drought alerts, based on proposals by the Inter-sectoral Drought Advisory Board and submitted information regarding drought severity, water shortage, and predicted drought conditions. Communication between the National Drought Authority and the Inter-sectoral Drought Advisory Board must be smooth, informative and regular.
- The Inter-sectoral Drought Advisory Board is responsible for the implementation of national operational drought-related tasks. It is coordinated by the Institute of Hydrometeorology and Seismology, which is the main institution for regular drought monitoring. The board is composed of sectoral experts from relevant institutions covering vulnerable sectors. Institutions involved in the Inter-sectoral Drought Advisory Board, including the Drought Reference Organizations, should monitor, assess and report drought conditions and impacts regularly; propose drought assistance projects; and implement agreed drought mitigation and response actions. If the defined drought alert thresholds are passed, the board prepares an announcement for the National Drought Authority about the overall situation and recommends the announcement of a drought warning. When drought conditions de-escalate, the Inter-sectoral Drought Advisory Board is involved in the drought recovery process and prepares a report on interventions conducted during the drought event.
- Drought Reference Organizations are competent institutions and organizations that are authorized to perform various drought-related monitoring and data provision. Civil society organizations, as intermediaries between state institutions and citizens, play a very important role in the process of information sharing and citizens' involvement in the decision-making process. They articulate and present concerns of local communities to national institutions and agencies. As they mediate between citizens and institutions in the process of adopting policies and laws, they also work to raise awareness. Civil society organizations and all other reference organizations prepare short reports summaries of monitored data, impacts or drought-related activities for submission to the Inter-sectoral Drought Advisory Board.

FIGURE 18. ILLUSTRATION OF THE INTERINSTITUTIONAL APPROACH ADOPTED IN MONTENEGRO



Source: Authors' own elaboration based on Montenegro. 2020. Montenegro National Drought Plan.

5.4.5. Taskforce and subcommittee approach

The taskforce and subcommittee approach directly aligns with the organizational structure proposed in the UNCCD Model National Drought Plan guidance document. Therefore, this simple model is useful for countries that may not have had, or have but have little implemented, previous drought or disaster management plans. The two subcommittees conform to all three pillars of IDM.

An example of this model is applied by Algeria, which created a specific Drought Group within its National Climate Committee. The Drought Group is a permanent high-level group capable of making rapid and immediately executable decisions, which is divided into two subgroups:

- The Preparedness, Mitigation, and Response Subgroup is composed of high-level decision–makers from government agencies and stakeholders. Those stakeholders comprise people on the ground who are affected by drought, called the Citizen Listening Unit. This subgroup's mission is to develop drought policy with the contribution of the Risk Assessment and Monitoring Subgroup and to develop proposals for actions at the national, regional and local levels.
- The Risk Assessment and Monitoring Subgroup is essentially composed of technical experts and includes a Technical Operational Unit. This subgroup, thus, integrates agrometeorology, urban water supply, agriculture and industries, socioeconomic changes, climate and environmental changes, and health. The responsibilities of this subgroup are the following:
  - → determine data needs;
  - → develop drought monitoring systems and connections with data providers;

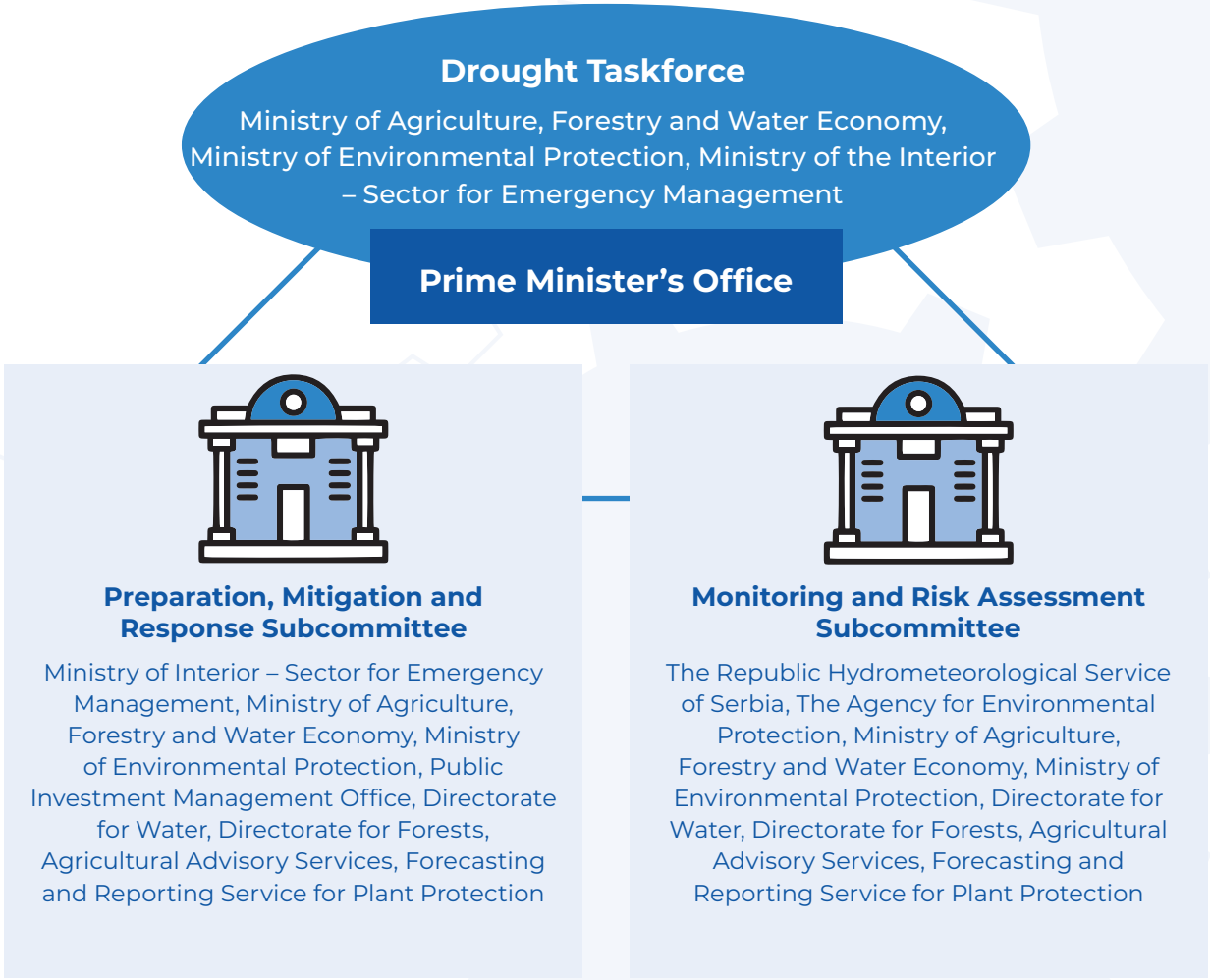
FIGURE 19. ILLUSTRATION OF THE TASKFORCE AND SUBCOMMITTEE APPROACH ADOPTED IN ALGERIA

Source: Authors' own elaboration based Algeria. 2019. Plan National Secheresse Algerie. Lignes Directrices En Vue De Son Operationalisation.

- collect data produced by data providers in relation to the agreed indicators and indices;
- assess and classify drought impacts and vulnerability;
- identify ways to reduce risks; and
- define data collection and distribution networks and systems.

Serbia also applies this model, which is overseen by the multisectoral Drought Taskforce. The Preparation, Mitigation, and Response Subcommittee, composed of senior policymakers from government, agencies, and key stakeholder groups, is responsible for drought planning. The Monitoring and Risk Assessment Subcommittee, comprising technical experts, is responsible for data needs assessments, data collection, drought monitoring system development, vulnerability and risk assessment, and risk reduction strategy development.

FIGURE 20. ILLUSTRATION OF THE TASKFORCE AND SUBCOMMITTEE APPROACH ADOPTED IN SERBIA



Source: Authors' own elaboration based on the Republic of Serbia. 2020. Recommendations for development of the National Drought Plan of the Republic of Serbia.

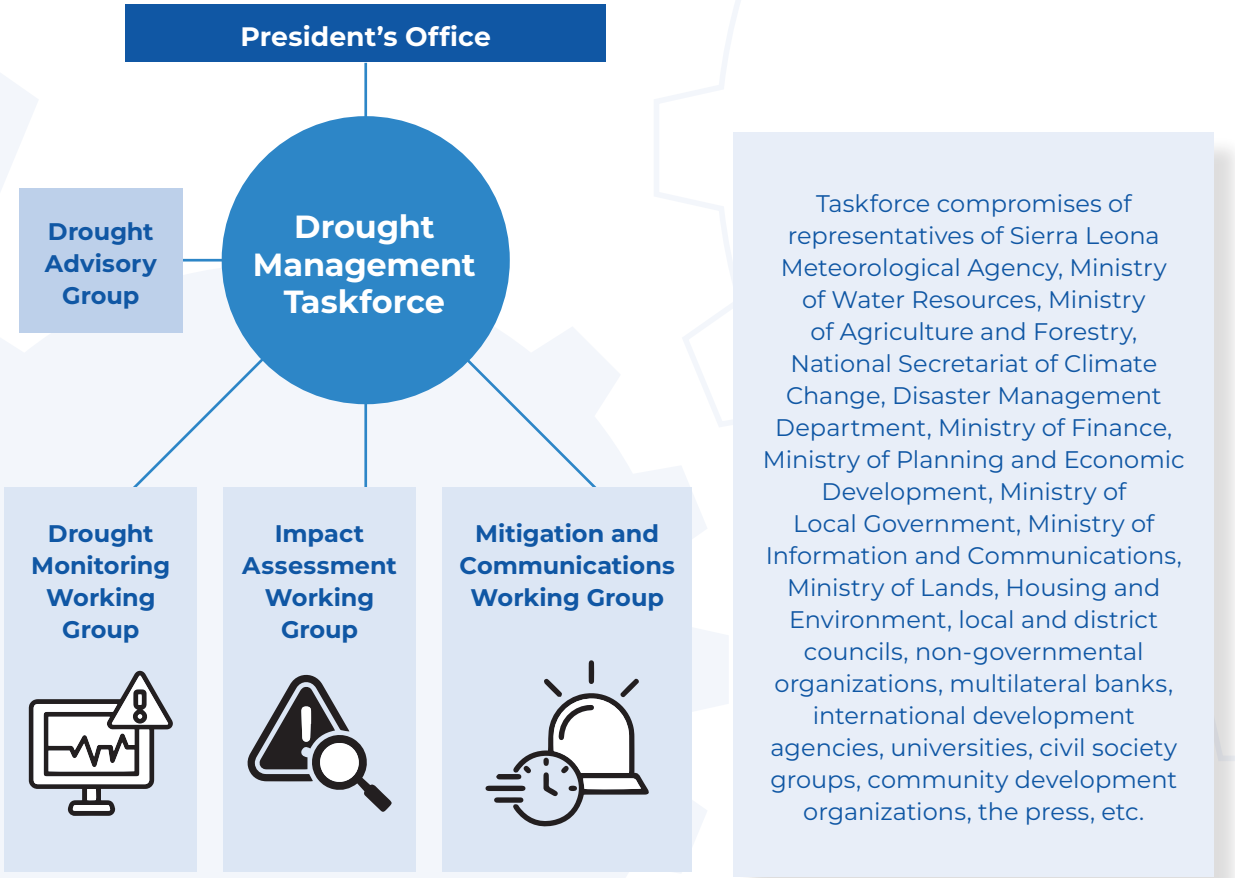
5.4.6. Three pillars approach

The three pillars approach assigns multisectoral representatives to working groups that align with each of the three pillars of integrated drought management. This model is useful for countries with little experience of drought at present because it is easily understandable and maps directly onto much available guidance about drought management.

Sierra Leone adopted this model with three working groups together forming a Drought Management Taskforce.

- The Sierra Leone Drought Management Taskforce serves as the nucleus of drought management operations. T is responsible for constituting the working groups and determining who should play a role in monitoring the development of drought conditions; implementing measures recommended in the National Drought Plan as drought develops and recedes; mapping and mitigating the risks and impacts of drought; and reporting on changes observed and recommending future steps.
- In the performance of these roles, the taskforce is supervised and advised by the Drought Advisory Group, which functions as a technical working group that includes actors with a keen interest in and specific roles for managing drought-related conditions across the country. The UNCCD focal person chairs the Drought Advisory Group and takes responsibility for coordinating the execution of all aspects of the drought management process, including the dissemination, implementation and update of the National Drought Plan through the Drought Management Taskforce's activities.

FIGURE 21. ILLUSTRATION OF THE THREE PILLARS APPROACH ADOPTED IN SIERRA LEONE



Source: Authors' own elaboration based on Massaquoi, A. S. 2018. Drought Management Plan: A Contingency Plan for Sierra Leone. Bonn, United Nations Convention for Combating Desertification Global Support Mechanism.

The institutional representatives that form the taskforce are grouped into the following three working groups based on their functions and competencies:

- The Drought Monitoring Working Group primarily monitors current and future water availability and moisture conditions. The working group focuses mainly on developing inventories, determining primary users' needs, developing or modifying information delivery systems, defining drought and developing response strategies, developing early warning systems, and identifying drought management areas. The chairperson is a member of the Drought Advisory Group and a representative of the Sierra Leone Meteorological Agency, which is tasked with drought monitoring and early warning. Members of this working group are representatives from agencies with responsibilities for forecasting and monitoring relevant indicators and indices.
- The Impact Assessment Working Group includes those economic sectors most likely to be affected by drought such as agriculture, transportation, water, health, etc. It also includes university scientists and representatives of international organizations that have expertise in early estimations of drought risks and impacts. Key roles for the working group include developing programmes to lessen drought impacts; determining how to target drought relief to vulnerable population groups and sectors; and analysing and communicating drought data to alert concerned groups on potential risks and impacts.

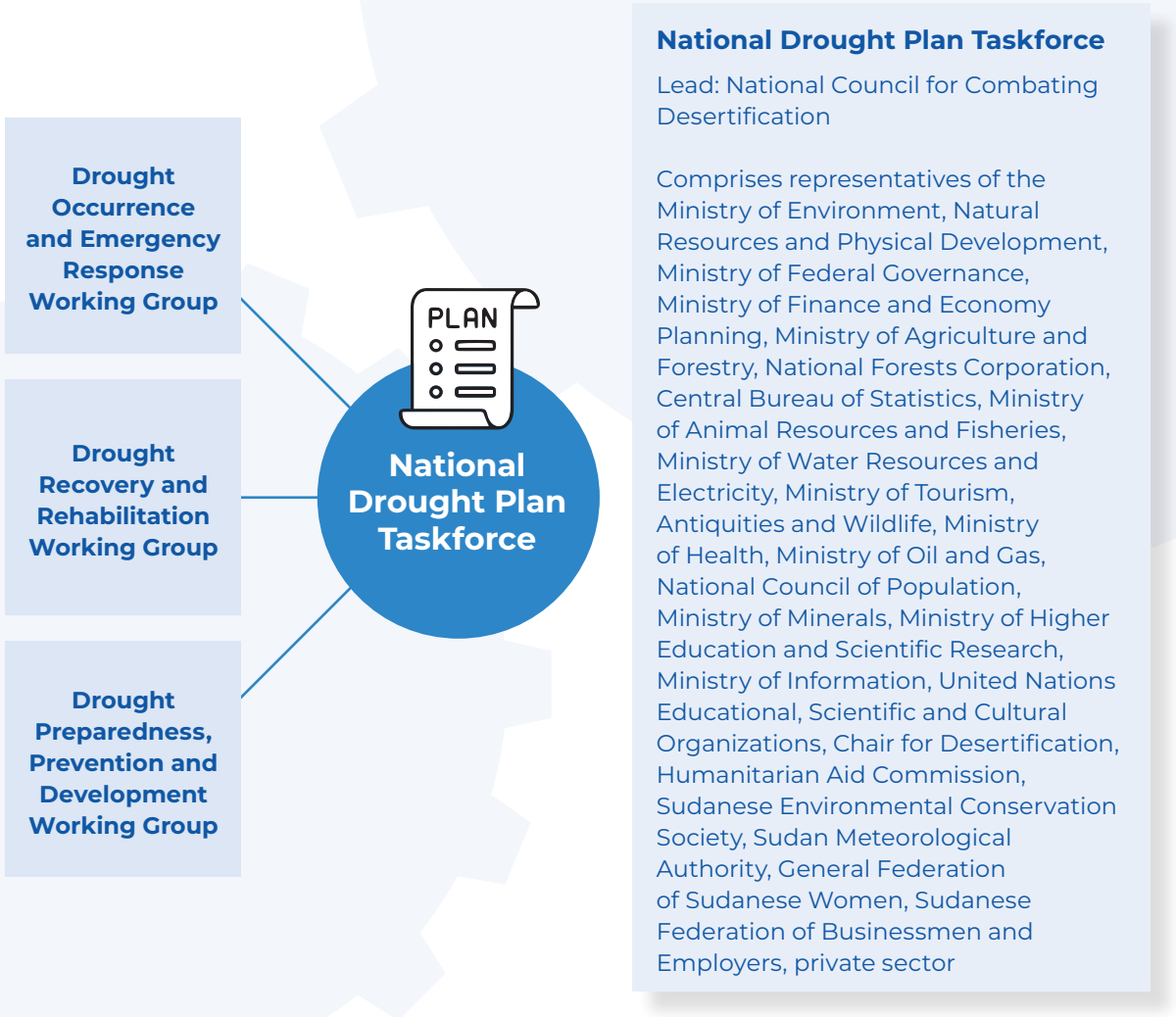
- The Mitigation and Communications Working Group principally leads the creation of long-range programmes to lessen vulnerability to drought while acting on the information and recommendations of the other working groups.

This model is also applied by Grenada, which has a Drought Management Committee that oversees working groups:

- Organizations responsible for the monitoring are the Water Resources Management Agency, Ministry of Agriculture, Ministry of Carriacou and Petite Martinique Affairs, Grenada Meteorological Services, Forestry Division, and Fire Department.
- Organizations responsible for risk assessment are the Water Resources Management Agency, Ministry of Agriculture, Ministry of Tourism, Ministry of Carriacou and Petite Martinique Affairs, Fire Department, and Inter Agency Group of Development Organizations.
- Organizations responsible for mitigation and response are the Fire Department, Water Resources Management Agency, Ministry of Agriculture, and Ministry of Works.

Grenada also utilizes clusters within these working groups, for example, the Monitoring Working Group includes a cluster related to communication and information, and another for education and awareness.

FIGURE 22. ILLUSTRATION OF THE DROUGHT PHASES APPROACH ADOPTED IN SUDAN



Source: Authors' own elaboration based on Republic of Sudan. 2018. Sudan National Drought Plan.

5.4.7. Drought phases approach

The drought phases approach, named for its working groups targeting the different phases of drought, differs from the cluster approach, which is based on the affected sector, and the three pillars approach, which has working groups based on the three pillars of integrated drought management. The phases approach typically has working groups aligned with:

- drought occurrence and emergency response,
- drought recovery and rehabilitation, and
- drought preparedness, prevention and development.

A drought commission is formed from representatives of drought-relevant ministries and agencies who are assigned to a working group depending on their mandate. Countries that have applied this model have stated that it is preferred to unite poorly coordinated ministries, departments and agencies with overlapping mandates and where financial resources are scarce.

This model is applied by Sudan with its National Drought Plan Task Force, led by the National Council for Combating Desertification, and comprising representatives of a range of governmental, civil society, and private sector institutions:

- The Occurrence and Emergency Response Working Group's members are representatives related to emergency and humanitarian assistance (Humanitarian Aid Commission, Civil Defense, United Nations agencies, NGOs, community-based organizations) and productive sectors (agriculture and livestock).
- The Recovery and Rehabilitation Working Group comprises actors involved in water, the environment, and natural resources.
- The Preparedness, Prevention and Development Working Group consists of actors involved in research, early warning, remote sensing, education and communication.

FIGURE 23. ILLUSTRATION OF THE DROUGHT PHASES APPROACH ADOPTED IN CÔTE D'IVOIRE

Source: Authors' own elaboration based on Côte d'Ivoire. 2020. Plan National Secheresse De Côte D'Ivoire 2021–2025.

This model, as applied by Côte d'Ivoire, differs in that there are only two sub-working groups: one is responsible for prevention and the other for response and recovery. The working groups are under a Permanent Executive Secretariat that monitors and evaluates all activities. The highest level is the Steering Committee, chaired by the representative of the Prime Minister's Office, with two vice-presidents: the representative of the minister responsible for the environment and the representative of the minister responsible for civil protection. Their roles are to define, orientate, approve and finance the working groups' activities. The Drought Working Group is responsible for:

- planning the implementation of the Steering Committee's decisions;
- proposing to the Steering Committee strategies for drought management;
- collecting, processing and analysing drought-related data;
- disseminating information;
- analysing community awareness and education actions;
- analysing response capabilities analysing recovery actions;
- proposing channels for mobilization of human and financial resources; and
- developing the communication plan.

These tasks are conducted by the appropriate sub-working group.

5.4.8. Functions approach

The functions approach separates drought management into different functions, some of which may consist of sector-specific committees, similar to the cluster approach. Generally, within a country, there are many institutions and stakeholders with different approaches to disaster management, including drought. They often have several responsibilities in common, and they all contribute to the implementation of national policies. Yet, the different structures and institutions regularly do not collaborate sufficiently on the ground. This results in an inconsistency in interventions, which often renders actions ineffective, leads to overlapping programmes, and wastes efforts and financial resources. The functions approach aims for harmonization between different actors by focusing them on particular functional needs. Additionally, or alternatively, the functional working groups can leverage existing relationships between institutions that have a history of working together.

In Tunisia, actors from drought-affected sectors outlined a functional disaster risk reduction mechanism and designation of responsibilities. Three principles were emphasized to achieve effective institutional coordination and drought risk reduction:

- consideration of the sectors significantly affected by drought, such as agriculture;
- use of existing structure through the adoption of effective coordination mechanisms that are easy to implement in the short term; and
- future reform of disaster risk management arrangements.

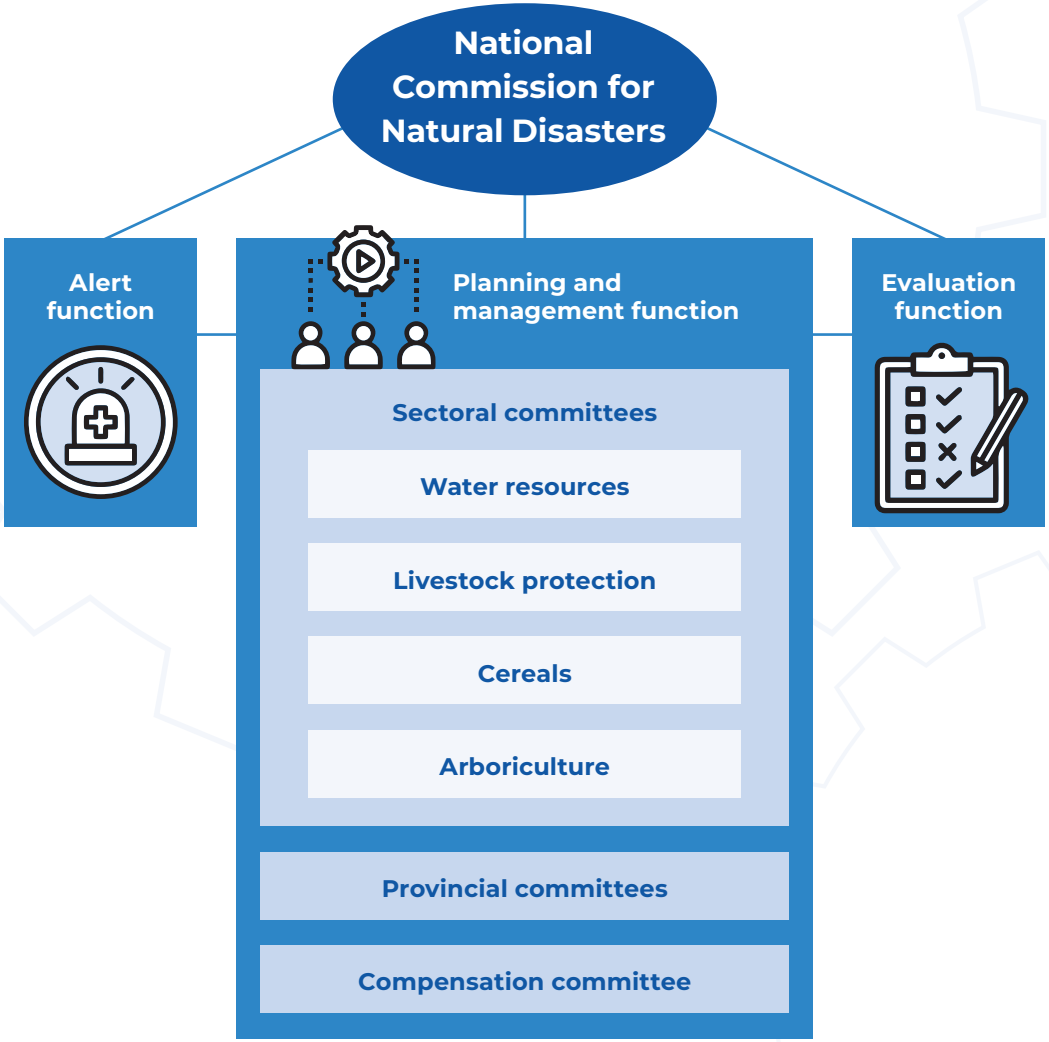
The newly proposed coordination approach is structured around three functions that cover the drought management cycle. Technical, sectoral and regional standing committees were established to carry out the mandated functions; hence, Tunisia's approach could be considered a combination of the standing committee, functions and cluster approaches:

- The alert function: This working group comprises a technical committee that collects data and processes information before dissemination in the form of periodic bulletins announcing the onset of a drought. The alert function working group also forecasts droughts.
- The planning and management function: This working group designs, recommends, and implements interventions to alleviate drought impacts. Impacts are divided into sector-specific clusters, each of which has its own committee, in addition to regional committees and a compensation committee:
  - → Water Resources Committee: Its main tasks include the establishment of regional plans for water security during summer and for managing water distribution.

- Livestock Committee: Its main task is to prepare a situational analysis and plan for stocks and fodder reserves, as well as monitor the state of health of herds. It is also responsible for developing a drought response programme and a post-drought recovery plan.
- Cereals Committee: Its main task is to prepare a situational analysis and plan for stocks, cereal production and cereal seed reserves. It is responsible for developing a drought-sensitive intervention programme and a post-drought recovery plan.
- Arboriculture Committee: Its main task is to prepare a situational analysis for the sector to assess the effects of drought and establish an intervention programme for forest conservation.
- Subnational Committees: These committees are responsible for assisting the sectoral committees in assessing the drought situation in each sector and for developing intervention programmes at the subnational level. They are also responsible for overseeing interventions at the subnational level.
- Compensation Committee: Its main tasks are to prepare estimates of drought-related damage; review the reports submitted by the insurance company of the Agricultural Disaster Compensation Fund; and prepare the decisions of the National Commission for Natural Disasters.

- The Evaluation Function: This working group comprises a Monitoring and Evaluation Committee, which is responsible for identifying possible inadequacies in the management of past droughts, estimating the costs of interventions, and formulating proposals to improve the measures undertaken.

FIGURE 24. ILLUSTRATION OF THE DROUGHT PHASES APPROACH ADOPTED IN TUNISIA



Source: Authors' own elaboration based on Tunisia. 2020. Plan National Secheresse Tunisie.

A secretariat is assigned to each function to facilitate the work of the working groups and the coordination between them. The General Directorate of Water Resources is the secretariat for the alert function while the General Directorate of Financing and Professional Organizations is the secretariat for the planning and management function and the evaluation function. The National Commission for Natural Disasters supervises the three functions and ensures consistency of their actions.

Another purveyor of this model is Burundi, which identified five functions to cover as many as possible of the different aspects of the prevention and management of drought crises in the country:

- production, which includes public and private organizations working in the environment, agriculture, livestock and fishing sectors;
- communication, which has the role of relaying information between and within the functions, and between actors on the ground and different civil society groups;
- rescue and assistance, which brings together national, international, public and private organizations likely to intervene to rescue and assist populations in the event of a crisis;
- care and prevention, which facilitates national, international, public and private efforts for adaptation and mitigation; and
- infrastructure, which includes all institutions involved in the establishment and maintenance of infrastructure that contribute directly or indirectly to the management of drought-related risks.

These functions are supervised by a national commission responsible for risk reduction and disaster management. This supervisory role's responsibilities include ensuring the integration of the functions, developing and implementing strategies, coordinating with the provinces, and collaborating with international partners.

Botswana also applies this model with four functions related to governance and institutional arrangements, drought risk knowledge, monitoring and early warning, and dissemination and communication. Each functional working group includes representatives of national and local government, research institutions, community groups, the private sector, resource users, and other partners. Botswana's National Drought Plan states that this collective approach is an essential and sustainable means of implementing the plan. Existing sustainable partnerships, which have evolved over time, are considered an ideal platform to support combined efforts towards mutual goals for drought response.

Nigeria, which also uses this model, works with three functions: monitoring and forecasting, management and coordination, and funding. The management function is subdivided into sectoral clusters with relevant institutions responsible for information and mobilization, education and awareness, population and mobility, energy and power, health, forest resources, food and livestock, research, rapid response, water security, advocacy, transport and logistics, immigration, security, and customs, respectively.

5.5. Guidance on institutional coordination model selection

When selecting an institutional coordination model to apply in a national drought plan, there are numerous criteria to be assessed:

The first set of criteria is related to resource efficiency:

- Does the country have a strong mechanism to coordinate stakeholder institutions, including the existence of information-sharing infrastructure and open communication channels? If yes, it would be more suitable to select an approach that can be integrated into existing institutions, such as the technical working group or functions approaches.
- Does the country have strong research institutes with the capacity to transfer knowledge to public agencies? If yes, it would be appropriate to select an approach that internalizes stakeholder knowledge, such as the interinstitutional or technical working group approaches.

- Does the geographical scale and the decentralization level of the country enable direct coordination with grassroots organizations? If yes, it would be good to choose an approach relying on vertical actors such as the functions or interinstitutional approaches.
- Conversely, is the country small and centralized with fewer available human resources? If yes, the technical working group approach would be appropriate with its single working group operating at all scales and sectors.
- Does the country have limited experience and accumulated knowledge of drought management? If that is the case, a straightforward model that starts from the basic foundations of integrated drought management would work best, such as the taskforce and subcommittee approach or the three pillars approach.
- Does the country already have established data collection services and institutions that are well connected and coordinated? If so, the interinstitutional approach may be most applicable, with its on-the-ground, advisory and decision-making levels.

The second set of criteria is related to the drought risk and its financial materiality:

- Do the scale of drought risk and the materiality of losses and damages exceed the availability and accessibility of existing institutions? If yes, an independent coordination mechanism that addresses drought in a cross-cutting and multidisciplinary manner is more appropriate, such as the cluster, taskforce and subcommittee, and three pillars approaches.
- Does the country frequently experience drought? Does it have significant arid or semi-arid regions? In this case, the best choice could be the standing committee approach that is anchored in high-level government.
- Is the country large with heterogeneous drought risk and a decentralized governance structure? If yes, approaches with designated provincial, district and local level committees would be advantageous.
- Does drought occur only sporadically and in localized areas in the country? In these cases, a temporary mechanism relying on existing resources, such as the interinstitutional and technical working group approaches, would work.

The third set of criteria is related to the alignment to the governance structure:

- Is the default governance structure of the country more centralized and composed of a limited number of authorities? Vertically structured approaches such as the standing committee and interinstitutional approaches are easier to accommodate.
- If the country has experience dealing with drought, but institutional coordination has not always worked well, the drought phases approach or functions approach may be a solution to uniting the different actors and harmonizing their actions, even where they have different or overlapping mandates.
- Alternatively, where institutions have a history of working well together, the functions approach can leverage these established good relationships towards drought management.
- Does the country already have an institutional coordination model in place for other natural hazards? If the answer is yes, and if it is successful, it would be a good idea to follow that same approach. This may mean incorporating drought into an existing cluster or functions approach with established clusters and functions to deal with particular affected sectors.

This information is for guidance only. The variety of example countries that apply the different models shows that there are not necessarily particular models that work for particular types of countries; it is possible to adapt a model to a country's resources and needs. Some models require higher financial and human resources, and some models require particular institutions. Countries with similar drought histories and economies may not be able to apply the same model due to governance or cultural differences. Whereas countries that are different socioeconomically and climatically may find that a particular model works well for both of them. The following section illustrates a case study to highlight how specific contexts and features influence the choice of the model.

5.5.1. Case study of the establishment of functional coordination mechanism in Sri Lanka

Sri Lanka is a tropical island with diverse geography and agroclimatic conditions. The rainfall regime divides the country into three zones: the wet zone, the intermediate zone, and the dry zone. While the southwestern zone of the country receives up to 5 000 mm mean annual rainfall, the dry zone in the rest of the country receives around 1 750 mm rainfall. Despite the sufficient amount of rainfall, the country is at risk of all types of droughts, as there is a prolonged dry period of about 5 months per year. Therefore, rainfall deficiency and uneven distribution of rainfall can easily turn into agricultural drought, leading to a reduction in crop production. On the other hand, the energy sector mainly relies on hydropower generation. Hydrological drought has severe consequences on the energy supply, which has a knock-on effect on all economic sectors. Managing drought risk in Sri Lanka is complicated due to the country's diverse geography and susceptibility to multiple simultaneous disasters. The dry and intermediate zones are prone to recurring droughts, and the southern and southwestern parts of the country are prone to frequent floods. The districts with the highest prevalence of affected people in the past decade are Kurunegala, Puttalam, Batticaloa, Jaffna and Trincomalee. Sri Lanka has registered three major drought events since the 2000s: 300 000 families were affected by the drought in 2001, 1.2 million people in 2017–2018, and 150 000 people in 2023 (Disaster Management Centre of Sri Lanka et al., 2009; United Nations Office for the Coordination of Humanitarian Affairs, 2017; Disaster Management Centre of Sri Lanka, 2023).

The intensification of severe drought events prompted Sri Lanka to introduce new and sector-specific drought mitigation measures and innovations, including technological instruments such as sensor-based monitoring systems to assess meteorological droughts or new crop varieties to mitigate agricultural drought; financial instruments such as parametric insurance products to prefinance early actions; and policy instruments such as water allocation plans to distribute water based on a priority order. Often, these measures are implemented in isolation due to the specific mandate of the responsible organization and the lack of continuous real-time communication among stakeholders.

The institutional architecture of Sri Lanka reflects the geographic and climatic diversity, and the natural resources endowment, which require different layers of managing institutions. Drought management is inherently a complex issue due to the involvement of many stakeholder institutions. As a result of this unique institutional structure, over 25 authorities and types of authorities are required to be involved in drought management, grouped into the six categories of stakeholder organization.

Sri Lanka is working on a coordination mechanism to harmonize institutional responsibilities. The Ministry of Environment, as the focal point of the UNCCD, spearheads the process, with the objective of enacting a legally established mechanism for coordinating drought management based on an agreed modus operandi. The identification of coordination mechanisms must consider various factors, including the existing governance type, scale of drought risk, financial requirements, and other common factors found in all countries. Furthermore, the following two country-specific issues restrict the selection of the coordination mechanism:

- The efficacy of institutional frameworks depends on the condition of the water infrastructure. Sri Lanka has one of the most ancient but active irrigation infrastructures, a part of which is recognized as a Globally Important Agricultural Heritage System. The tank cascade system is a gravity-fed network of about 16 000 rainwater storage and conveyance structures with multiple functions such as groundwater recharge, biodiversity conservation, community management and climate change adaptation. The hydraulic design of tank systems allows for efficient water storage, which plays a critical and major role in mitigating the impact of drought in Sri Lanka. As much as they bring multiple benefits, the tank systems are sensitive to maintenance flaws. In addition to the regular maintenance and rehabilitation required for all tanks, the sheer number of over 10 000 active tanks makes their management immensely demanding.

These tanks are managed by various institutions like the Department of Agrarian Development, farmers' organizations, provincial-level authorities, or departments of different ministries, thus exacerbating the situation. The physical health of these infrastructures does influence the performance of the managing institutions that are responsible for covering the associated costs. Nevertheless, these institutions usually have distinct fiscal spaces. Unless a central fund is allocated for the maintenance of tanks, the condition of the infrastructure will affect the ability of the institutions to manage drought risk through the high-performing water sector.

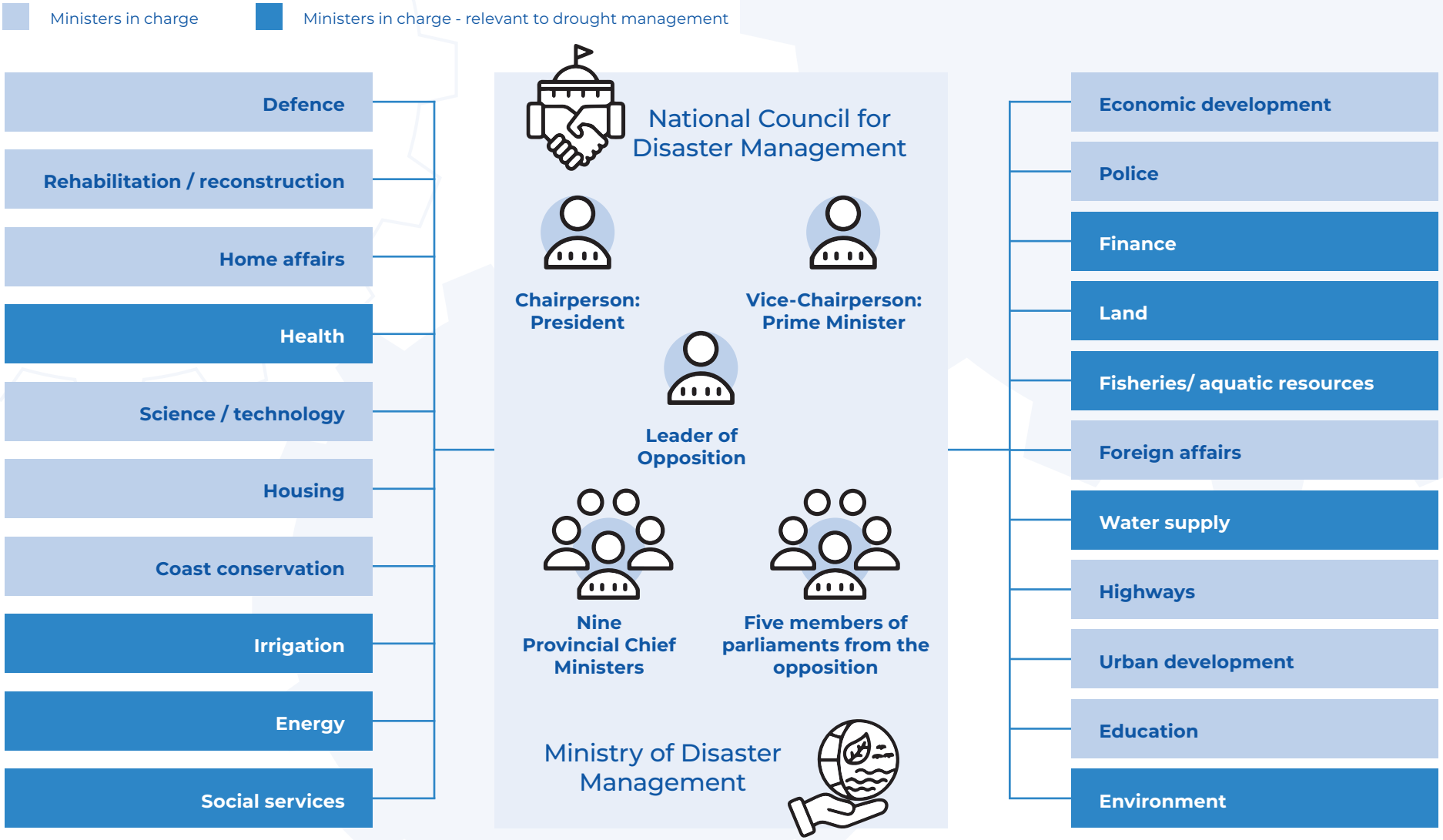
- There is a lack of an interinstitutional data-sharing system that could act as a digital link among the stakeholder institutions. Sri Lanka has numerous technologies deployed for data management, among them the newly launched DroughtWatch application, the Platform for Real-Time Impact and Situation Monitoring system developed by the World Food Programme (WFP), sensor networks for water resources monitoring, etc. Although the data is available, there is no unequivocal access to it. The root cause of the compromised accessibility is the lack of an umbrella platform that could collect, synthesize and display data to all stakeholders. The development of the umbrella platform is key to establishing any type of coordination mechanism.

FIGURE 25. INSTITUTIONAL ARCHITECTURE OF STAKEHOLDERS RESPONSIBLE FOR DROUGHT MANAGEMENT IN SRI LANKA

Core institutions	→ Natural Resources Management Division / Ministry of Environment (UNCCD focal point) → Department of Meteorology/ Ministry of Disaster Management → Department of Agriculture / Ministry of Agriculture and Plantation Industries → Department of Agrarian Development / Ministry of Agriculture and Plantation Industries → Irrigation Department / Ministry of Irrigation → Mahaweli Authority of Sri Lanka / Ministry of Irrigation → Ministry of Finance and Planning → National Water Supply and Drainage Board / Ministry of Water Supply and Drainage → Disaster Management Center and National Disaster Relief Service Centre / Ministry of Defence
Affected sectors	→ Department of Wildlife Conservation / Ministry of Wildlife and Forest Resources Conservation → Department of Forest Conservation / Ministry of Wildlife and Forest Resources Conservation → Lanka Rain Water Harvesting Forum → Climate Change Secretariat / Ministry of Environment → Ministry of Health → Ministry of Power and Energy → Ministry of National Policies and Economic Affairs → National Aquaculture Development Authority / Ministry of Fishery and Aquatic Resources Development → Water Resources Board / Ministry of Water Supply and Drainage
Vulnerable populations	→ District Secretariats → Provincial Councils
High-risk natural hazards	→ National Disaster Relief Services Centre and National Disaster Relief Service Centre / Ministry of Defence
Research, innovation and collaboration	→ Agriculture and Agrarian Insurance Board / Ministry of Agriculture and Plantation Industries → National Aquatic Resources Research and Development Agency → International Water Management Institute → Universities

Source: Authors' own elaboration.

FIGURE 26. ORGANIZATIONAL STRUCTURE OF THE NATIONAL COUNCIL FOR DISASTER MANAGEMENT IN SRI LANKA



Source: Authors' own elaboration based on the work of Silva, S. 2024. Participatory session. Workshop summary at 2nd National Workshop on Establishing Institutional Coordination Mechanism for Integrated Drought Management in Sri Lanka, 5 March 2025. Colombo, Ministry of Environment.

The density of existing institutions offers a great deal of potential institutional frames. This implies that any coordination mechanism can be embedded into a selected institution without the need to establish a new and independent institution. The wide array of potential leads of coordination includes horizontal actors such as sector-specific councils, and vertical actors such as provincial and district-specific councils. For example, the Disaster Management Act No. 13. (2005) created two institutions under the Ministry of Defence. The Disaster Management Centre is mandated to prepare and implement a national policy on disaster management, national disaster management plans, national emergency operation plans, and institutional disaster management plans. It is also responsible for providing support to all public sector agencies and for mobilizing resources for the implementation of policies and plans. The National Council for Disaster Management is the primary agency tasked to implement directives. The Council can provide a readily available institutional frame to integrate a drought-specific coordination mechanism, as it already pools the key actors.

The existence of a legally established host institution is a practical advantage in Sri Lanka as resources can be leveraged to operate the coordination mechanism, such as human expertise, physical infrastructure, institutional memory, etc. As in most cases when a coordination mechanism is integrated into an existing institution, the emphasis should be given to the development of a proper communication strategy that links the stakeholder institutions to the lead coordinator. The lack of data-sharing infrastructure is a major impediment to communication, but there are further gaps to be filled, such as the need for a regular stakeholder platform to share experiences and communication with direct stakeholders. Given the above baseline, Sri Lanka conducted a rigorous analysis through a multistakeholder consultation. The analysis included a stocktaking and a review of some coordination mechanism approaches as shown in Table 3.

The analysis highlighted some key challenges while composing the coordination mechanisms. For example, some approaches might escalate the inequalities among institutions with different financial backgrounds, leading to an imbalanced implementation of sector-specific measures. Others might downplay the role and share of a stakeholder group. In some cases, the coordination mechanism may become dependent on the performance of specific members. However, understanding the strengths and weaknesses of different approaches can guide the solutions, and hybrid coordination mechanisms can be engineered by combining different approach segments. For example, a hybrid mechanism can borrow the expertise-sharing modality of the technical working group approach, whereas the diversity and the number of acting institutions in Sri Lanka can be a lever. Such an approach can integrate the level of involvement of the highest authorities, proposed by the standing committee approach. Also, the streamlined communication method of the cluster approach can be added to the hybrid mechanism.

In summary, Sri Lanka has a myriad of high-performing policy and legal instruments, technological solutions and institutional frames, which can be utilized. The purpose of establishing a coordination mechanism is to organize and manage these resources effectively and to avoid redundancy in institutional functions. ■

TABLE 3. SUMMARY OF THE REVIEW OF THE APPLICABILITY OF APPROACHES IN SRI LANKA

Approaches	Strengths	Weaknesses	Resources	Potential challenges
Cluster 	→ Improved collaboration → Streamlined communication → Specialized focus area → Resource optimization → Local engagement	→ Dependency on stakeholder engagement → Communication gaps → Exposure to administrative delays → No integrated data-sharing or decision-making system	→ Human resources → Financial resources → Technical resources → Logistical support	→ Limited awareness and understanding → Inadequate infrastructure → Further and unexpected disaster impacts → Resource inequality among the clusters → Community resistance
Standing committee 	→ Continuous engagement → Expertise and specialized knowledge → Consistent decision-making process → Resource optimization → Holistic approach	→ Exposure to administrative delays → Limited flexibility → Dependency on the composition of the committee → Periodicity of technical involvement	→ Human resources → Technology-related resources → Financial resources → Infrastructure	→ Limited public involvement → Data availability and accuracy → Coordination with local institutions → Limited adaptability
Technical working group 	→ Technical expertise and specialized knowledge → Involvement in research and innovation → Efficient problem-solving mechanism → Flexibility and adaptability	→ Limited holistic perspective → Dependency on technical capacities	→ Human resources → Data and technology-related resources → Research infrastructure → Capacity-building instrument	→ Interdisciplinary coordination difficulties → Engagement of high-level authority → Translation of technical advice into policy measures
Taskforce and subcommittee 	→ Comprehensive expertise → Flexibility and adaptability → Effective coordination → Resource optimization → Local strategies → Full compatibility with the concept of the United Nations Convention to Combat Desertification	→ Exposure to administrative delays → Resource allocation inequalities	→ Human resources → Data and technology-related resources → Infrastructure → Capacity-building instrument	→ Coordination difficulties → Communication gaps → Policy integration and compatibility with pre-existing national frameworks → Community engagement

Source: Authors own elaboration based on Silva, S. 2024. Participatory session. Workshop summary at 2nd National Workshop on Establishing Institutional Coordination Mechanism for Integrated Drought Management in Sri Lanka, 5 March 2025. Colombo, Ministry of Environment.

6 Stakeholder engagement in national drought management

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For a national drought plan to be effective, all relevant stakeholders and sectors of a country need to be engaged. For confirmation, in the context of stakeholder engagement or participation, "stakeholder" here refers to actors on the ground, i.e. those who experience drought impacts such as farmers, water users, local businesses, and local communities. The taxonomy of models for institutional coordination inherently incorporates elements of stakeholder engagement, which are elaborated in this section. Following a description of the stakeholder engagement approach of each institutional coordination model, an example is provided of a country that uses that model, who it engages with, and how (Box 1). It is important to note that many of these stakeholder engagement approaches and examples, or aspects of them, are similar and applicable to multiple institutional coordination models.

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BOX 1. Stakeholder engagement in various planning templates

Step 3 in the National Drought Plan of the United Nations Convention to Combat Desertification

Step 3 – Seek stakeholder participation: It is essential to identify all citizen groups and solicit input from stakeholders who have a vested interest in drought planning. For example, community focus groups or citizens' advisory councils that are included in the taskforce's organizational structure can facilitate communication and implementation of the plan. The process of stakeholder involvement should assess the dimensions of gender and age, as well as the interests of indigenous peoples, migrants, and other segments of the population already affected by water scarcity to identify the high-risk stakeholders whose adequate access to water for personal and domestic use is most likely to be compromised.

Step 3 in the ten-step template for action of the Integrated Drought Management Programme

Step 3 – Seek stakeholder participation; define and resolve conflicts between key water use sectors, considering also any transboundary implications: Drought intensification increases competition for scarce water resources, leading to conflicts. Addressing conflicts during non-drought periods is crucial. Early identification and involvement of all citizen groups, including the private sector, are essential for fair representation in the national and subnational drought plan development process. In the case of transboundary rivers, international obligations under agreements should be considered. Inclusive discussions early in the process promote understanding and collaborative solutions. Public interest groups significantly influence policymaking and should be included to avoid hindering progress. Establishing a permanent citizen's advisory council in the national drought commission's organizational structure facilitates public participation and conflict resolution.

A national drought plan development process must adopt a multilevel, multidimensional approach. Aligning basin plans with national plan goals is crucial. State or provincial governments should consider establishing district or regional advisory councils to bring stakeholders together, discussing water use issues and seeking collaborative solutions ahead of drought events.

Sources: **United Nations Convention to Combat Desertification**. 2018. *Model National Drought Plan*. Bonn, United Nations Convention to Combat Desertification https://www.unccd.int/sites/default/files/2021-12/Model%20National%20Drought%20 Plan%20Guidelines.pdf; **World Meteorological Organization** and **Global Water Partnership** 2014. *National Drought Management Policy Guidelines: A Template for Action* (D.A. Wilhite). Integrated Drought Management Programme (IDMP) Tools and Guidelines Series 1. World Meteorological Organization (WMO), Geneva, Switzerland, and Global Water Partnership (GWP), Stockholm, Sweden. https://www.droughtmanagement.info/literature/IDMP_NDMPG_en.pdf.

The cluster approach tasks its sector-based clusters with identifying and incorporating all relevant institutions and stakeholders, which should include the appropriate government departments, NGOs, community-based organizations, and the private sector. In Eswatini, these additional stakeholders include parastatals, farmers, clinics, schools, international cooperating partners, and local government authorities, who are self-evidently relevant for their clusters relating to, for example, health, food and agriculture, and education.

Due to its vertical structure, the standing committee approach naturally connects with people on the ground at its lowest levels. District-level committees and community-level committees below them, are well-placed to gather and convey stakeholder concerns to higher levels of governance. In addition, these committees assist in developing locally relevant policies and raising awareness of national strategies. In Ghana, district-level committees consist of representatives of decentralized departments, NGOs, community-based organizations, traditional chiefs and women's organizations. Their supervision of community-level committees ensures that local stakeholders, particularly farmers with their wealth of experience in local conditions and customs and their invaluable indigenous knowledge, are involved in the formulation, decision processes, and implementation of all activities that are planned to solve their problems.

The technical working group approach incorporates stakeholders of all levels within the single committee. Rather than being consulted in lower-level committees and their input passed up the institution coordination model, stakeholders are automatically involved in policy, strategy, and intervention development and implementation. In Guyana, the Technical Working Group comprises, alongside government agencies, the International Federation of Red Cross and Red Crescent Societies, water user associations, the National Toshaos Council, Women Across Differences, and youth organizations.

The interinstitutional approach, with its drought reference organizations, utilizes community-based organizations as intermediaries between state institutions and citizens. As a designated step in the coordination model, the important role of these community-based organizations is highlighted and facilitated. Their role is in information-sharing and involving citizens in decision–making. The information flow and consulting work in both directions, as the organizations articulate and present concerns of local communities to national institutions and agencies, and mediate between citizens and institutions in the process of adopting policies and laws.

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The taskforce and subcommittee approach typically places key stakeholder group representatives within the preparation, mitigation, and response subcommittee. The organization of these subcommittees must be in a way that encourages citizen participation in decision-making. Algeria established a Citizen Listening Unit, which is national, but its focus is mainly local, under the responsibility of its Preparation, Mitigation, and Response Subgroup. It is composed of representatives of civil society, with equal proportions of men and women with environmental, professional, artisan, and rural women's associations' backgrounds. This unit is tasked with identifying early natural signs of drought in support of technical units and producing qualitative indicators for monitoring the effects of drought. The unit reports to the subgroup the negative social impacts of drought on livelihoods, health, employment, and population migration.

The three pillars approach requires the overseeing committee to identify and assign relevant stakeholders to the working groups associated with each pillar. This may include farmers' associations in the monitoring subgroup to contribute to drought early warning, health and women's organizations to characterize and assess drought impacts, and local-level governments to deal with mitigation, preparedness and response. Sierra Leone leverages the Ministry of Local Government and Rural Development in its Drought Management Task Force to facilitate the involvement of traditional leaders and council representations in each pillar's working group. These leaders and council representations are in a position to involve other locally relevant stakeholders, including NGOs like the International Federation of Red Cross and Red Crescent Societies, whose expertise and experience is useful in planning for relief support, as well as in seeing drought management efforts through a human development and security lens.

The drought phases approach is similar to the taskforce and subcommittee approach and the three pillar approach in that relevant stakeholder groups are identified, and their representatives are assigned to a particular working group according to their experience. Again, it is the role of the overseeing committee to cultivate stakeholder participation with special emphasis on a bottom-up approach that includes communities in decision making and implementation. In Sudan, members of its Drought Occurrence and Emergency Response Working Group are United Nations agencies, NGOs, and community-based organizations involved in emergency and humanitarian assistance and productive sectors. Its Drought Recovery and Rehabilitation Working Group comprises actors involved in water, the environment, and natural resources, such as research institutes and government agencies. The Drought Preparedness, Prevention and Development Working Group consists of actors involved in research, early warning, remote sensing, education and communication, which includes academic and research institutions as well as actors involved in community-level capacity-building and empowerment.

The functions approach, which separates drought management into different functions, tasks the lead institution of each functional working group with identifying and incorporating all relevant stakeholder groups. Because functions are often technical, such as drought forecasting, funding or evaluation of governance procedures, lower-level stakeholders are generally incorporated in functions relating to drought preparedness, mitigation and response. Where the functional working groups are subdivided into clusters, e.g. agricultural production, water resources, the environment, etc., stakeholder engagement follows as per the cluster approach. In Burundi, the Production Working Group includes the Provincial Offices for the Environment, Agriculture and Livestock, which collaborate with agricultural, zootechnical and technological research institutions and agricultural producers. In addition to transferring technologies and training farmers, they produce and transmit environmental, agricultural, livestock and fisheries statistics for the province. The Communication Working Group plays an important role in awareness building, mitigation, prevention, risk management, and information dissemination from bottom to top and top to bottom via workshops with women's associations and agricultural cooperatives, local radio, leaflets, posters, television, and newspapers. The Rescue and Assistance and the Care and Prevention Working Groups, respectively, involve women's groups, overseas technical and financial partners, and NGOs working in

health and humanitarian interventions. Finally, the Infrastructure Working Group is predominantly made up of technical institutions, such as those involved in hydrometeorological monitoring, and hydraulic, sanitation and energy infrastructure.

6.1. Case study of community-based drought monitoring in Montenegro

Stakeholder engagement, in general, is limited to activities related to the second and third pillars of IDM. This is because monitoring and early warning are often device-based and require sophisticated scientific approaches to produce information. An innovative approach for community engagement in drought monitoring was developed by the DriDanube programme, financed by the European Union and implemented in the Danube region. Montenegro is one of participants in the programme that included a component on the establishment of national reporting networks. The networks are considered a key input for monitoring and early warning through the provision of ground-truth data. The National Drought Plan of Montenegro reinforces the aspirations to engage communities as an integral part of IDM. According to the plan, civil society organizations must play an intermediary role between the communities and the state. They not only represent communities but participate in the adoption of policies and laws, and they contribute to awareness-raising.

The reporting network draws on the involvement of communities to monitor the early signs of drought impacts weekly. Observations are recorded in an online survey that is sent to the Institute of Hydrometeorology and Seismology for further processing and modelling. The reported data are integrated with remote sensing products to calculate parameters and indices, eventually to be visualized and distributed on a map. This information serves as a basis for agricultural and water resources planning. The online survey is a fundamental instrument for understanding the situation on the ground. While it is designed be user-friendly, the questions cover a range of impacts, from soil moisture to yield losses. In turn, the National Drought Plan of Montenegro lists over 80 examples of potential impacts, most of them falling under the economic impact category. Future expansion of the complexity of the survey can provide further input for an extended analysis. Nevertheless, this requires a more intensified collaboration from the reporters.

Stakeholder engagement is a critical foundation for operating the drought monitoring network in Montenegro. Nevertheless, the observation of impacts requires experience and understanding of drought events. Therefore, becoming a reporter requires knowledge of agriculture or forestry. Another important requirement is to directly involve members of the communities instead of assigning staff from local public institutions. These two requirements help align the mitigation actions to the needs of communities. To this end, empowering communities and civil society organizations is a key strategy for fulfilling their roles in IDM. ■

7 Communication as an instrument for institutional coordination

In drought management, effective communication serves dual purposes: it facilitates institutional coordination and conveys pertinent information to stakeholders. While communication for institutional coordination focuses on streamlining efforts among various agencies and stakeholders involved in drought response, drought communication generally encompasses a broader scope, addressing public awareness, risk communication, and dissemination of drought-related information. It involves educating the public about drought conditions, potential impacts and necessary actions, as well as fostering community engagement and resilience-building initiatives. By clarifying this distinction, it is ensured that these guidelines address both the strategic coordination needs within institutions and the broader communication strategies essential for effective drought management at large.

Efficient communication between the different institutions working together on drought in a country is key to success. The commissions, committees and working groups that constitute the different models for institutional coordination all have their own tasks and goals, but well-established communication and information flow between them and up and down the command chain is a necessity to ensure effective drought planning and management. Good communication is especially critical between groups who may not often come into contact, such as those focused on policy, those focused on science, and those conducting actions or experiencing impacts on the ground.

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It is critical to have the communication protocols established before a drought occurs. When a drought is declared, just as there is a response plan that is followed by different actors according to the drought severity level, the communication plan must also be followed. In addition, the communication plan is also in place for preparatory and recovery periods.

In order to develop communication protocols, specific information is needed, including the content to be communicated. As a result, the communication strategy should only be prepared when there is general information available about drought risk and impacts, trigger threshold levels, affected and involved stakeholders, and mitigation actions. In other words, a communication strategy is one of the final steps in preparing a national drought plan.

7.1. A communication strategy for all times, not only during drought

The purpose of a drought communication strategy is to provide a context within which a structured communication plan on drought can be developed. This will guide the development of cost-efficient and effective communications about drought at subnational, national and international levels.

Step 8 of the IDMP ten-step template for action recommends as a starting point the publicization of national drought management and preparedness plans to build public awareness and consensus. If there is good communication with the public throughout the process of establishing the drought legislation and plans, there may already be improved awareness of the goals of the drought legislation, the rationale for policy implementation, and the drought planning process by the time the plan is ready to be implemented. Public information specialists such as national news services, broadcasting companies, ministries of information or communication, and private media houses are vital in this regard. Throughout the plan development process, it is imperative for local and national media to be used effectively in the dissemination of information about the process as a first step to implementation.

During non-drought periods, specific events are excellent opportunities to raise awareness of drought among government ministries and agencies and the public.

Some of the national drought plans have well-developed communication strategies with aspects that are transferable to other countries.

7.1.1. Case study of drought communication strategy: Zambia

Zambia's drought communication protocol is based on the strategies for communication protocols stipulated for Southern African Development Community (SADC) member states for climate change impacts and water-related disasters such as droughts and floods (SADC, 2008).

Zambia's drought communication protocol lists target audiences for drought communication, explaining why they should be reached:

- The public: to ensure they are aware of developing and current drought conditions, as well as the institutions dealing with drought issues.
- Senior government officials, ministers, politicians and district commissioners: It is important for communication messages to reach them because their institutions formulate drought mitigation and management efforts, in addition to initiating, directing and approving actions, and are therefore essential in the management of drought. This can only be done efficiently when these officials have an in-depth knowledge and appreciation of drought.
- Governmental and quasi-governmental technical experts: These include engineers, hydrologists and climatologists as well as economists, sociologists, and government extension workers who have direct contact with other target audiences such as water users and farmers. The extension workers are in a prime position to reach out to farmers and other water users, with whom they are in close contact and are, in most cases, respected and accepted by communities.

FIGURE 27. OBJECTIVES OF THE DROUGHT COMMUNICATION STRATEGY OF ZAMBIA

Source: Authors' own elaboration based on Republic of Zambia. National Drought Plan. 2020.

- Private sector, civil society, NGOs and water service providers: They should be reached because they play a pivotal role in regional and local cooperation. NGOs are important especially at the grassroots level; hence, their involvement and empowerment are vital. The service providers include government agencies involved in water supply, sanitation and hygiene, NGOs, and water utility companies who generally implement water supply schemes and thus have a role in ensuring equitable access and utilization.
- Schools and training institutions, youth, school clubs, academics, and curriculum developers: School is the best avenue for reaching the youth and influencing future leaders. Communication should employ both formal and non-formal types of education. The formal type targets the curriculum while the informal targets extramural or extracurricular activities. Entertainment, publications and education should be carefully developed for this target group.
- Water users: Recipient communities and users such as farmers, irrigators, water committees, and other sectoral water users such as industries and commercial enterprises, should be empowered because they are central to issues of sustainability and immediately suffer from reduced water supply.
- Funding agencies, cooperating partners, donors, and other partners that provide technical assistance: They should be reached to increase their understanding of priority capacity gaps regarding drought.
- The media: Regional media institutions should be equipped to be effective communication intermediaries on drought issues. With adequate capacity, the media can reach wider audiences and shape positive opinions. They also have the potential to propel non-performing decision-makers or service providers into action.

7.1.2. Case study of drought communication strategy: Ghana

Ghana's communication policy has a key concept in all core written and visual messages: "Preparedness for living with drought". This concept acknowledges that drought is an integral part of daily life in Ghana. It also recognizes that drought and its associated ecological, economic and social consequences impede the welfare of individual rural households, rural economies, and the social stability of the country. Finally, it expresses that improving and protecting rural livelihoods and promoting food security will not deliver long-term benefits if these efforts are not embedded in sound, integrated and sustainable drought management.

Ghana's communication strategy has five objectives: promote environmental governance, create coalitions, share knowledge, remove barriers, and generate investment. Different communication tools are proposed to reach the different target audiences:

- TV broadcasts: monthly educational TV programmes broadcast on national channels with two to five repeat screenings per month. These aim to promote the concept of multisectoral drought management and inform the broader public of methods and technologies to address the consequences of drought on poverty and livelihoods.
- Drought news (radio, print, online): independent communication on drought management on existing multi-stakeholder platforms. The approach is multimedia and multilingual, considers the Ghanaian context, and draws on and strengthens local capacities. It draws on the experience and capacities of government ministries and departments, civil society and private organizations, and other relevant media and communication partners. Independent news reporting is distributed through print media, radio, a dedicated news website, and targeted newsletters for decision-makers with links to the drought commission's website and knowledge management system.
- Journalist training: workshops to strengthen the capacity of local journalists to contribute to drought management through their own media outlets. The drought commission conducts training workshops at major events related to drought management, laws, procedures, regulations, norms and standards. The training and practical advice aim to increase reporting on drought issues and improve the quality of reporting. In addition to the formal training sessions, the journalists receive hands-on guidance and enjoy the opportunity to meet policymakers and heads of ministries, departments, agencies and donor organizations, and other delegations present at these events. This activity also supports TV broadcasts, dialogues, roundtables, and other major events by issuing announcements, invitations, coverage and reports.
- Regular updates to partners (e-newsletter): to keep partners updated on new developments and changes to the National Drought Plan. These quarterly newsletters have a more internal orientation to ensure that all partner organizations are kept abreast of strategic developments, policy processes, upcoming meetings, and required input. Quarterly newsletters should respond to the information needs of partner organizations, provide succinct information with more details available than on the drought website, provide opportunities for input by partner organizations, and be produced regularly.
- The drought commission website: the main source of information to the wider public in Ghana and abroad. The website should be updated at least monthly and on the occasion of any major event concerning drought activities, initiatives, press communications, newsletters, etc. This requires the recruitment of professional permanent staff responsible for the maintenance of the website and management of general internal information communication technologies. The following considerations should be given to the website:
  - → design of a new at-a-glance homepage that gives an overview of drought, its occurrence, frequency, and impact;

- profile of the partners involved in drought management and their interests and roles;
- provision of space for administration or process-related information;
- provision of space and content for technical know–how, solutions, and success stories;
- provision of dedicated space for policy work and advocacy;
- networking, discussion, and interaction enabled through the website; and
- provision of a contact management service, where individuals can register interest and obtain details of relevant focal points.

The drought website should be linked to agencies, events related to drought management, and news websites, which will provide more general updates, trends, and reports of approaches to drought around the world.

- Joint publications with government, ministries, departments, agencies and civil society organizations: The purpose of joint technical publications is threefold:
  - to disseminate technical knowledge about implementing drought management approaches, using the publication production process to synthesize knowledge;
  - to foster interdepartmental and multipartner collaboration through joint publishing; and
  - to produce literature for dissemination by partners for their own promotional and/or advocacy purposes.

  It is essential that the content of technical publications responds to the needs of stakeholders and is probably more practical or field-oriented, than an exhaustive or academic analysis of the issue. Preference should be given to producing these technical publications in flexible digital publishing formats while summaries could be produced in hardcopy.
- Dialogues and roundtables: High-level dialogues and roundtables are political and advocacy events used to obtain buy-in, commitment, and leadership from organizations and the government. By nature of the logistics involved in organizing these events, they are best implemented during the high-level segments of major events. The content design of the dialogues and roundtables should support key objectives of the drought management plan at the particular event or have a frank problem-solving type of debate, which could also include discussing funding issues. It would be prudent to design a series of dialogues in support of drought fundraising. It is essential to hand-pick participants, design the agenda with care, and choreograph the whole event meticulously, as any political blunders at these dialogues and roundtables could create impediments to drought management.
- Event planning: This requires a concerted effort to advocate the same message in as many different opportunities as possible for the duration of the event. For example, the following could be organized:
  - policy briefs circulated to all the delegations to influence the formal negotiation process;
  - one or two technical side events to reinforce the advocated drought plan perspectives, one of which could include the screening of a promotional video;
  - a poster session or exhibition that provides an overview of drought initiatives, the latest science, opportunities for partnerships, and
  - a political roundtable event with high-level participants to debate options on reforming legislation and policy, and set funding priorities.

AII of these should be supported by drought literature which could include audiovisual materials, posters and brochures, policy briefs or statements, and technical publications.

- Human resources: people involved in drought management should be trained in communication on drought matters. Financial resources and time of drought staff for communication must be considered.

7.2. Declaration of drought

In most cases, the declaration of drought is a political event that indicates the acknowledgement of drought by governments and high-level political actors. The declaration is usually based on a legal instrument such as a legal act that can be revoked by political decision once the drought is over. This necessarily implies close communication between the technical agencies responsible for drought monitoring and the political actors, most often a minister, the prime minister, or the president. Each proposed coordination mechanism gives a platform to maintain communication, but it is the task of the agency responsible for monitoring to translate the scientific information into a decision–support process. The declaration is not only a political acknowledgment but a commitment to responding to the conditions. Therefore, there must be a solid technical analysis considering all perspectives of drought.

Several critical factors influence the designation of the authority responsible for advising and triggering the drought declaration by high-level authorities. First, the authority must possess expertise and access to reliable data and scientific assessments regarding meteorological, hydrological, agricultural and socioeconomic conditions. This ensures that drought declarations are based on accurate and comprehensive information. Second, transparency and accountability are paramount, necessitating clear criteria and protocols for declaring a drought. Collaboration and consultation with relevant stakeholders, including government agencies, local communities, and scientific experts, can enhance the legitimacy and acceptance of drought declarations. Ultimately, striking a balance between scientific rigor and stakeholder engagement is essential to ensure that triggered responses lead to equitable distribution of resources such as drought subsidies and insurance benefits.

The task of advising on the declaration of a drought is typically assigned to a technical hydrometeorological agency or the drought commission. During the development of a national drought plan, a set of indicators must be decided upon, which are then continually monitored, and thresholds must be specified that correspond to a particular drought severity and alert level. The choice of indicators must make it possible to identify all types of drought: meteorological, agricultural, hydrological, socioeconomic, ecological and flash drought. The definition of triggering thresholds is region-specific, according to climatic zones, types of predominating vegetation and agriculture, and variations in population vulnerability. Effective drought monitoring and early warning should combine precipitation and other climatic parameters with water-related data, encompassing streamflow, snowpack, groundwater levels, reservoir and lake levels, and soil moisture. This holistic evaluation is crucial for understanding both present and prospective drought and water supply situations. Monitoring the on-the-ground impacts, including socioeconomic indicators, as a drought evolves assists in refining severity assessments in different regions. The definition of drought configured to the specific context of the country must be clearly established in order to enable the declaration.

Those involved in monitoring should convene regularly, especially prior to the peak demand season and/or the onset of the rainy season. Subsequent to each meeting, comprehensive reports must be compiled and distributed to the drought commission, relevant sectors, and the media. If circumstances necessitate, the drought commission leadership should provide a briefing to high-level government regarding the report's contents, including any recommendations for specific actions. Public dissemination of information should undergo scrutiny by a public information specialist to prevent the proliferation of confusing or contradictory reports on current or approaching conditions.

7.2.1. A case study of the declaration of drought and the drought response action plan for Serbia

The European Union recommends the inclusion of a set of indicators and indices into each specific national drought monitoring system for a harmonized approach:

- Meteorological drought: standardized precipitation index (SPI), standardized snowpack index.
- Agricultural drought: fraction of absorbed photosynthetically active radiation, soil moisture anomaly.
- Hydrological drought: groundwater level, standardized runoff index.
- Water scarcity: water exploitation index plus.

These should be supplemented by country-specific indicators and indices considering the variability of climate and geographic conditions. The European Union recommends using different levels of drought intensity and impact severity for drought classification, with four stages:

- Normal status: when there is no observed significant deviation in relation to average values.
- Pre-alert status: when monitoring shows the initial stage of drought development.
- Alert status: when monitoring shows that drought is occurring and will probably have impacts in the future if measures are not taken immediately.
- Emergency status: when drought indicators show that impacts have occurred, and water supply is not guaranteed.

The current drought monitoring system in Serbia strives to follow the European Union recommendations. It is based on SPI, Palmer Drought Severity Index (PDSI), Palmer Z Index, and soil moisture anomaly, with acknowledgement and intentions that integration of additionally available data would provide a better definition of different drought stages and different drought types across the country. The dekadal bulletin by the Republic Hydrometeorological Service of Serbia is used to assign the drought category. The threshold values that determine drought categories and the associated phase of the warning system are continually re-evaluated, especially after significant drought events. Predetermined drought response actions are undertaken when the defined drought stages are declared. The regular revision is intended to identify weaknesses in the classification system to remove any inconsistencies. In addition to the four phases, the fifth phase is a declaration of a drought ending when selected indicators return to normal conditions.

Serbia utilizes the taskforce and subcommittee approach for institutional coordination. As each successive alert phase is declared, the Monitoring and Risk Assessment Subcommittee increases monitoring and the frequency of preparation of reports on current conditions for the drought taskforce. Actions by the Mitigation and Response Subcommittee transition from recommendations for voluntary action to restrictions and finally, to legal requirements (Table 4). The drought taskforce likewise increases the frequency of meetings, consultations and communication between its members, including considerations of possible future scenarios based on drought forecasts. Predetermined actions can be continually evaluated after every drought, following lessons learned during and after the drought, in order to optimize the actions.

Linking the communication strategy with drought indicators and trigger thresholds is a global good practice that facilitates the execution of mitigation actions. This can be done by linking the declaration and actions to the evolution of the drought event, such as in the case of Serbia. A more detailed approach involves establishing links between monitoring indicators for different types of drought and specific actions for each sector. For example, arid countries typically utilize hydrological drought indicators, such as water levels in reservoirs, to trigger actions in the water sector and to inform stakeholders about the mitigation strategy. Developing communication pathways supports this targeted approach to convey relevant and targeted information to specific sectors and stakeholders.

TABLE 4. MONITORING, THRESHOLD VALUES, AND THE TRIGGERED ACTIONS ALONG THE DROUGHT PHASES IN SERBIA

Phase	Category	Standardized Precipitation Index	Z index	Palmer Drought Severity Index	Action
Normal	Normal	from -0.93 to 0.93	from -1.24 to 0.99	from -1.9 to 1.9	–
Pre-alert	Moderate drought	from -1.2 to -0.93	from -1.25 to -1.0	from -2.0 to -2.9	Voluntary actions; increased monitoring; more active communication among the actors of the coordination mechanism, etc.
Alert	Severe drought	from -1.6 to -1.3	from 2 to -2.74	from -3.0 to -3.9	Actions to minimize risk; water-saving and preventive actions to protect water; intensified monitoring; more frequent communication among actors of the coordination mechanism, etc.
Emergency	Extreme drought	below -1.7	less than -2.75	less than -4.0	Declaration of emergency; actions to supply water for priority purposes; enacting relevant national laws and legal mechanisms; intensive monitoring and communication.
End of drought					Declaration of the end of drought; revocation of implemented measures: preparation of special report including the analysis of the drought and its impacts; review of the effectiveness of the National Drought Plan.

Source: Authors' own elaboration based on the Republic of Serbia. 2020. Recommendations for development of the National Drought Plan of the Republic of Serbia.

7.3. Communication pathways during drought

Regarding communication with those who experience drought impacts, as stated by the Eswatini National Drought Plan (2020): "There is a need for effective communication and collaboration between data and information producers and users in order to empower communities under threat from natural and other hazards to take effective and timely decision-making to protect lives, property and the environment from the effects of disasters." Acknowledgement has grown regarding the significance of information and communication as crucial forms of assistance, alongside conventional humanitarian aid like provision of food, water and shelter. The absence of adequate information and communication impedes affected individuals from reaching essential services and making informed decisions for themselves and their communities. Allowing people to express their opinions and offer feedback not only improves their overall well-being but also aids them in adapting to the challenges they confront, empowering them to play a more active part in their recovery.

During a drought event, various communication channels and tools can be used to disseminate information about drought management, including:

- print media: newspapers, magazines, newsletters, leaflets, brochures, posters, billboards;
- electronic media and broadcast: radio, television, documentary, interactive websites, social media;

TABLE 5. SUMMARY TABLE OF COMMUNICATION APPROACHES

Target audience	Communication approach	Advantages	Disadvantages
Rural communities	Radios, television, mobile phones, posters, leaflets, meetings, workshops, extension service, grassroots organization	Radio and television to reach a mass audience	Not everyone has access to radio and television, and it requires electricity.
		Mobile phones to convey messages fast	Not everyone has access to mobile phones or network coverage, and it requires electricity to charge.
		Posters and leaflets to easily distribute information	Posters are prone to vandalism, and leaflets are often considered junk mail.
		Meetings and workshops to provide training	It can be time-consuming, expensive, and can induce workshop fatigue.
		Extension service and grassroots organization to convey targeted and trusted information	It has a limited capacity to cover all stakeholders.
Urban communities	Radios, television, mobile phones, posters, leaflets, newspapers, meetings, workshops, social media	Radio, television, mobile phones, posters, leaflets, meetings, and workshops have the same advantages as under the previous target audience.	Radio, television, mobile phones, posters, leaflets, meetings and workshops have the same disadvantages as under the previous target audience.
		Newspapers to be easily accessed	The readership of print newspapers is declining.
		Social media to cover a wide range of stakeholders	Social media requires internet access or data bundles and modern technologies which may exclude older generations.
Government	Meetings, workshops, policy briefs, reports	Meetings and workshops to maintain two-way discussions	It is difficult to achieve broad attendance and full attention.
		Policy briefs and reports to provide a concise presentation of information	There is competition with other sectors and issues for limited attention.
International community, private sector, donors	Websites and social media, events (press conferences, meetings, workshops, dialogues and roundtables), policy briefs, reports	Websites and social media to reach out to professional communities	It requires a high workload to keep websites and social media up to date.
		Events to be targeted and successful for collaborations and funding	It is expensive and requires a high workload to organize.
		Policy briefs and reports to provide a concise presentation of information	There is competition with other sectors and issues for limited attention.

Source: Authors' own elaboration based on Philippines. 2019. National Drought Plan for the Philippines; Kingdom of Eswatini. 2020. Eswatini National Drought Plan.

- direct stakeholder engagement: interactive engagements such as meetings, workshops, symposia, exhibits and displays, road shows, school clubs; and
- social media platforms: drought commission or hydrometeorological agency website and accounts on social media.

It is important to consider translation into all necessary languages, including consideration of different skills, competencies and levels of understanding, as well as clear and simple communication protocols in any messages distributed to people vulnerable to drought. The advantages and disadvantages of different communication approaches are presented in Table 5.

7.4. Communication pathways of the different institutional coordination models

Most aspects of the communication strategies described so far in Section 7 are applicable to the whole taxonomy of institutional coordination approaches. However, the models sometimes have specific communication pathways, which are detailed in this subsection with examples. Depending on the country's context, many of these communication pathways have wider applicability.

The cluster approach requires its sector-based clusters to provide the drought commission with relevant data, e.g. available and forecasted water volumes, water access in different areas, and water quality indicators. Similar data would be provided from other clusters regarding, for example, energy and food supply, crop production, and public health indicators. These datasets are analysed by the drought commission and reported to the highest levels of government. The successful implementation of sectoral and regional actions then depends on the dissemination of clear and timely information for the periods before, during and following a drought. The effective functioning of the cluster approach depends on the fluidity of communication and the speed of exchange of information between clusters, the drought commission, top-level ministers, and the public.

In Somalia, when a drought is declared, an emergency planning meeting is held to trigger assessment missions by the different clusters. Needs assessment reports are produced that consider the local-, state- and national-level capacity to respond. The drought commission then mobilizes resources for the cluster and ensures the relevant authorities and stakeholders are engaged. Responses are monitored and cluster coordination meetings are held frequently with minutes and reports passed to the drought commission. Once conditions improve, impact assessments, situational reviews, and lessons learned are reported to the drought commission and higher levels of government to aid the improvement of drought planning and management.

The vertical structure of the standing committee approach facilitates information flow from the highest to the lowest levels and back again. District and community-level committees are well-placed to raise awareness of national strategies, gather and convey stakeholder concerns to higher levels of governance, and enable the co-development of locally relevant policies. Good communication within the committees is vital to motivate partners to collaborate for the mainstreaming of drought issues. The district and community-level committees must collaborate in order to transcend sectoral interests, pool resources, and scale up interventions for greater impact. This collaboration and sharing of knowledge promote replication, build capacity, and empower people.

In recognition of the need for official procedures of drought communication and systems between actors involved in monitoring, the state, local governments, and the public, Zimbabwe established a communication protocol that describes the drought communication role of each actor involved in drought management (Table 6).

The technical working group approach should be straightforward in terms of communication because actors of all levels and from all sectors are present within a single committee. Consequently, all involved actors are automatically included in plan, strategy and intervention development, implementation, monitoring, and feedback.

TABLE 6. STAKEHOLDER AND DROUGHT COMMUNICATION PROTOCOL FROM ZIMBABWE'S NATIONAL DROUGHT PLAN

Actor	Communication
President	→ Declares state of disaster, declares drought
Civil Protection Unit, Ministry of Agriculture, humanitarian organizations, Zimbabwe Vulnerability Assessment Committee	→ Advise on the declaration of drought conditions → Recommend drought declaration → Initiate mitigation and preparedness actions
Regional Drought and Weather Forecast Forum, National Early Warning Unit, Meteorological Services Department	→ Conduct climate and drought monitoring for the region → Provide national long-term and seasonal drought forecasts for member states
Ministry of Environment, tourism and hospitality industry, Meteorological Services Department, Zimbabwe Vulnerability Assessment Committee, National Early Warning Unit, Drought Monitoring Centre	→ Continuously monitor intraseasonal droughts and provide early warning → Monitor drought and advise the government on the country's drought status
Meteorological Services Department	→ Provides drought early warnings → Informs stakeholders on drought progress
Agriculture Research and Extension Service, Food and Agriculture Organization of the United Nations (FAO), Zimbabwe National Water Authority, Ministry of Public Service, Labour and Social Welfare, NGOs	→ Take drought mitigation measures and practices → Develop preparedness strategies
Media	→ Support public awareness and education → Communicate mitigation and preparedness strategies
District officers, International Federation of Red Cross and Red Crescent Societies, local authorities	→ Collate weather and environmental data from stakeholders → Advise relevant authorities
Farmers, Agriculture Research and Extension Service	→ Report on drought status to local authorities → Assess crop, livestock, and natural environment status and condition
Local authorities, education institutions, civil society groups	→ Implement water conservation measures → Introduce sustainable livelihood strategies

Source: Authors' own elaboration based on Zimbabwe. 2020. National Drought Plan for Zimbabwe.

Within the technical working group in the Republic of Moldova, certain actors have predefined key communication responsibilities according to the drought alert level. The State Hydrometeorological Service issues drought warnings, and the State Service for Civil Protection and Exceptional Situations as part of the Ministry of the Interior assists with the dissemination of these warnings, which may be via television, radio, print, and online media. The National Federation of Farmers, with its network of 15 regional organizations, disseminates drought information to agencies, agricultural producers, and the public. Government agencies communicate by telephone, fax, mobile phone, and via limited use of radio communications. Each response organization has its own internal radio frequency, and interagency communication among medical units, police and fire brigades can be established over a standard frequency, to be activated during emergencies. In practice, mobile phones dominate communication among disaster response units.

The interinstitutional approach inherently acknowledges the importance of good communication by utilizing civil society organizations as intermediaries between state institutions and citizens. Their role is in information-sharing and involving citizens in the decision-making process. The information flow and consultation work in both directions with the intermediary organizations presenting the concerns of local communities to national institutions and mediating between citizens and institutions in the process of adopting policies and strategies.

In Colombia, the Multi-Sectoral Advisory Group transmits information to the Drought Commission and community organizations by issuing official letters and specific circulars, and holding technical meetings to promote the design and implementation of risk reduction measures and to formulate or adjust contingency plans. For the public, special messages are designed and distributed for dissemination via the drought commission website, social media, television and radio. The education and communications sectors collaborate to produce messages for the public aimed at the rational use of water and energy, along with measures to prevent wildfires, disease and other health issues.

The taskforce and subcommittee approach, as per all the approaches that involve a drought commission, places representatives of key institutions in its taskforce and subcommittees to facilitate communication. That includes a representative from the premier's office for the rapid transmission of information and decision-making. A public information specialist advises on communication strategies, including the formulation of effective messages for the media. Institutional capacity may need to be created in the subcommittees to expedite the formal communication and reporting to the taskforce. This is especially important for the integration of science and policy and the conversion of objectives into actionable interventions.

Serbia's National Drought Plan emphasizes the importance of two-way communication between the three bodies – Drought Taskforce, Preparation, Mitigation and Response Subcommittee, and Monitoring and Risk Assessment Subcommittee – because it is common that feedback from institutions responsible for response to institutions responsible for monitoring and risk assessment is lacking. Such feedback is crucial for the optimization and improvement of the alert system that triggers actions and responses.

During non-drought conditions, Serbia's Monitoring and Risk Assessment Subcommittee assembles quarterly to prepare synthesis reports for the previous three months, which include both standard monitoring products from the hydrometeorological service and additional relevant information from other agencies in the subcommittee. These reports are sent to the Drought Taskforce and the Preparation, Mitigation and Response Subcommittee, and are released to the public via a dedicated website established by the Drought Taskforce to provide drought-relevant information.

If products derived from weather, subseasonal or seasonal forecasts indicate drought development in the future, special notes about this development are prepared by the Monitoring and Risk Assessment Subcommittee and sent to the Drought Taskforce and the Preparation, Mitigation and Response Subcommittee. This note means both bodies are aware that potential acceleration in activities can be expected in the near future.

When drought indicator thresholds are passed, special notes are prepared and sent by Serbia's Monitoring and Risk Assessment Subcommittee, and the frequency of communication between the three bodies increases. Quarterly reporting becomes monthly reporting, then weekly at high alert levels, containing additional information on impacts. In parallel, the Preparation, Mitigation and Response Subcommittee prepares monthly, then weekly, reports about measures that are activated, which are predefined according to the alert stage. The Drought Taskforce is responsible for appropriate communications to the public and all relevant stakeholders who do not directly participate in any of the three bodies. After the end of the drought event, a joint report by the two subcommittees is prepared with information on the physical, social and economic aspects of the drought event, together with an assessment of applied measures. Such a synthesis report is important in updating and improving the drought management plan.

The three pillars approach requires the monitoring working group to prepare and pass on situation reports to the other working groups and the overseeing drought commission, while the risk and impacts assessment working group prepares and passes on assessment reports, and the mitigation and response working group prepare and pass on implementation reports. The drought commission prepares and transmits policy documents.

To facilitate the smooth functioning of the National Drought Plan, Grenada established an Early Warning and Information Systems Committee with the overall responsibility for coordinating the communication aspects. This committee is led by the Ministry of Agriculture and also comprises the Meteorological Service, National Water and Sewerage Authority, National Disaster Management Agency, farmers' representative, Fire Department of the Royal Grenada Police Force, Media Workers Association of Grenada, Government Information Systems, and Grenada Chamber of Commerce. Another committee, or cluster, the Awareness, Education and Outreach Committee has the responsibility to develop and implement a drought education and awareness plan for schools and community groups. This committee consists of the National Disaster Management Agency, Meteorological Service, National Water and Sewerage Authority, Ministry of Agriculture, farmers' representative, Media Workers Association of Grenada, Government Information System, Ministry of Education, Chief Education Officer, and Friends of the Earth Grenada. This committee's aim is to reduce water users' vulnerability to drought impacts and make them more aware of response measures, thus enabling them to better appreciate drought communications, especially the different alert levels.

For the drought phases approach, the occurrence and emergency response working group is responsible for communicating an approaching drought and drought alert levels. The preparedness, prevention and development working group develops and communicates strategies to reduce vulnerability during non-drought periods. The recovery and rehabilitation working group assesses drought impacts and evaluates responses, which are reported to the other working groups and the drought commission for improvement of the national drought plan.

Côte d'Ivoire learned from its experience of communication strategies during efforts to combat desertification. Subsequently, Côte d'Ivoire's drought communication strategy involves empowering the relevant working groups to ensure that:

- Early warning notifications are not too technical and detailed to be understood and acted upon.
- Society is educated about drought and its consequences so it can equip communities and individuals with the essential skills and values to anticipate disruptions, adapt to them, and mitigate drought impacts.
- The media have adequate drought knowledge to provide informed, verified, understandable, and useful coverage of drought.
- Gender and youth experts are involved so that capacity building is equally provided and adapted to the specific needs and social behavior of different target groups.
- Officials are adequately trained in data collection, analysis and use.

Regarding the first point, Côte d'Ivoire recommends continuously reviewing the usability of drought outputs at the level of different users in order to improve communication and feedback between producers and users of information. Climate monitoring and early warning products must be adapted to the specific needs of users so these can be effectively incorporated into operational decision-making. For example, the agriculture and livestock sectors might require data regarding the start and end of the rainy season or the dry season, as well as the distribution of rainfall, to determine the best time to plant, to reduce or increase the quantity of livestock, to provide additional fodder, and to decide the rotation of pastures. On the other hand, the hydrological sector may be more interested in variations in river flow and reservoir levels to enable the planning of water resource allocation for hydroelectric power production, irrigation, and domestic and industrial uses.

In the functions approach, information flow and fluid communication between the functions are essential for the optimal operation of the model. The functions involve actors at both national and regional levels, providing the necessary connections for the involvement of society in each function. It also establishes links with existing consultative bodies to guarantee consistency in government action. Some countries that utilize this approach, such as Botswana, Burundi and Nigeria, have designated communication and coordination functions that take on the role of relaying information between and within the functions, to and from higher levels of government, as well as to and between actors on the ground.

In Tunisia, during normal conditions, the Alert Function Working Group meets at least four times per year or season and produces monthly bulletins that are shared on the online Drought Platform. During drought conditions, this Alert Function Working Group meets at higher frequency providing a continuous exchange of information with other working groups and the Drought Commission. The Drought Commission forms when alerted of drought by the Alert Function Working Group, and if deemed necessary at other times. The action plans the Drought Commission prepares are then communicated to the Planning and Management Function Working Group, which orders the respective clusters to implement the interventions. The clusters directly liaise with all stakeholders affected by the intervention measures prescribed in the action plans. They also collect data on drought impacts and their geographical distribution to transmit to the Evaluation Function Working Group. This Evaluation Function Working Group liaises with insurance companies and provides advice to the National Drought Commission regarding compensation for affected sectors and populations. Post-drought, assessment reports are passed to the Drought Commission by the working groups, following consultation with stakeholders regarding the effectiveness of interventions. The Drought Commission's subsequent recommendations for improved drought management are then publicly shared.

To facilitate information exchange between institutions and to make information available to all, the establishment of an online platform is recommended, as exemplified by Tunisia's Drought Platform. Differentiated levels of access are granted to users based on their needs. For example, the raw data are reserved for the Alert Function Working Group who declare drought alerts; the indicators and their cartographic presentation are accessible to the clusters within the Planning and Management Function Working Group; and the periodic bulletins are accessible to the public and the media. The digital platform serves as a space for sharing relevant documents, like drought management assessment reports. A space in the platform is dedicated to interacting with all stakeholders and receiving their feedback regarding drought management. The online platform constitutes the main tool to facilitate coordination between different stakeholders and communication about drought. It also contributes significantly to strengthening transparency. Management of the platform is the responsibility of the Alert Function Working Group. ■

8 Monitoring and evaluation mechanisms for national drought plans

8.1. The need for monitoring and evaluation

It is vital that all institutions in the coordination mechanism are mutually aware of each other's actions when those actions pertain to drought management. For example, if a particular ministry implements a project in a certain area that boosts water supply, increases agricultural resilience or diversifies income, how this project affects drought management must be evaluated for inclusion in national drought plans. To give more concrete examples:

- It is increasingly common in some areas of the world, such as the Near East and many islands, to install desalination plants to increase potable water availability. This would most likely reduce the drought risk, but would the high energy demand be affected by drought? Would the high cost of the water mean unequal distribution? Would the desalination plant provide sufficient water for all uses if other sources are depleted?

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- Efforts were made to increase public water supply in Grenada following severe dry seasons that led to high consumer dissatisfaction and economic losses, especially considering the economically important tourism sector. New water supply infrastructure was developed, including rainwater harvesting, boreholes and desalination. In addition to drought management plans being updated with new projects and strategies, how this new infrastructure supports disaster risk reduction must be monitored and evaluated.
- Argentina has many monitoring products and early warning systems, which are primarily aimed at agriculture. Not all of the data or systems are openly available. Therefore, other sectors and the public may not be aware of their existence, which means actions do not result from the early warnings. For improved drought management, there is a need to monitor and evaluate these products and systems, including how they could be used, by whom, and how effective they are.

Unlike specialized plans, such as irrigation master plans, agriculture modernization plans, etc., the drought plans largely build on an integrated concept, whereas the action plans comprise a sum of measures implemented by different sectors. Some actions will be executed directly by the responsible drought commission or institution, but these are mostly related to strategic and coordination-level decisions. Majority of the actions are implemented by sector-specific institutions. The compilation of an all-encompassing action plan, therefore, requires the stocktaking and screening of ongoing and pipeline projects. Against this background, the screening of the drought-related actions per stakeholder is the first step in establishing the monitoring and evaluation mechanism. This can help eliminate the redundancy in the country programming and leverage the resources used by stakeholder institutions.

A common issue is that stakeholder institutions do not acknowledge their actions or projects as contributing to drought resilience-building, despite them doing so. For example, a programme to rehabilitate irrigation canals to improve water use efficiency is often considered a water conservation measure that supports the reliable and equal distribution of water. Nevertheless, water conservation and more predictable access to water contribute clearly to drought preparedness. To understand the importance of the categorization of programmes and projects, the dataset collected by the Development Assistance Committee of the Organization for Economic Co-operation and Development (OECD-DAC) was analysed. OECD-DAC collects information about the official development assistance allocated to meeting the objectives of the Rio Conventions (OECD, 2022). The Rio marker methodology classifies the project through five markers: environment, desertification, biodiversity, climate change mitigation, and climate change adaptation. The analysis included the climate change- and desertification-marked projects between 2000 and 2020. Although a large share of them supports drought resilience-building in various ways, only a small fraction includes reference to drought in the title or description. Therefore, the stocktaking and screening for the compilation of action plans in the drought plans should investigate the projects and programmes tagged with various subjects:

- Water resource management and examples of actions contributing to drought resilience: strategies to optimize water usage, enhance water efficiency, and develop alternative water sources such as rainwater harvesting or groundwater replenishment. These may include implementing water conservation measures, improving irrigation systems, and promoting sustainable water practices to mitigate the impacts of droughts.
- Resilient agriculture and examples of actions contributing to drought resilience: promoting drought-resistant crops, implementing sustainable farming practices, and improving irrigation efficiency. These may involve providing farmers with access to drought-tolerant seeds, training in climate-smart agriculture techniques, and diversifying livelihood options to minimize agricultural losses during periods of drought.

- Climate change and disaster risk reduction, and examples of actions contributing to drought resilience: enhancing community resilience to drought-related disasters by implementing early warning systems, developing risk assessment tools, and promoting climate-adaptive practices.
- Environmental protection and examples of actions contributing to drought resilience: protecting and restoring ecosystems affected by droughts, such as wetlands, forests and watersheds. This may involve reforestation efforts, soil conservation measures, and restoration of degraded landscapes to enhance water retention and biodiversity. Additionally, these projects may focus on preserving critical habitats for wildlife and promoting sustainable land management practices to mitigate the environmental impacts of drought.
- Community empowerment: building the resilience of vulnerable communities by strengthening their capacity to cope with drought impacts. This may include providing training in livelihood diversification, improving access to social safety nets, and fostering community-based natural resource management initiatives. Additionally, these projects may empower communities to participate in decision-making processes related to drought preparedness, response and recovery efforts.
- Conflict mitigation and gender-responsive interventions: promoting conflict resolution mechanisms and ensuring gender-responsive approaches to drought management. This may involve addressing conflicts over water resources, promoting gender-equitable access to resources and decision-making processes, and addressing the specific vulnerabilities of women and marginalized groups affected by drought. Additionally, these projects may support initiatives that promote social cohesion, inclusivity and gender equality in drought-affected communities.
- Capacity building, policy advocacy, institutional support and research: strengthening the resilience of institutions and stakeholders involved in drought management. These may involve raising awareness; providing training and technical assistance to government agencies, NGOs and community-based organizations; advocating policy reforms to enhance drought preparedness and response; and conducting research to improve understanding of drought dynamics and effective mitigation strategies. Additionally, these projects may support the development of drought monitoring and early warning systems, as well as knowledge-sharing platforms to facilitate learning and exchange of best practices in drought management.

The stocktaking and screening of projects and programmes may include a set of synonyms to identify drought projects, thus guiding policymakers in the compilation of action plans. Nevertheless, some terms can be used as direct wildcards of drought, while others must be used in conjunction. For example, community resilience can refer to drought management if it is in the context of climate resilience, integrated land and water management, or water management. Also, there are words that are often used interchangeably with drought, though, this is scientifically incorrect. For example, heatwave is a different climate phenomenon, yet it is often used to describe drought conditions.

To expedite the process of the stocktaking and screening, these terms (Table 7) must be discussed with the stakeholder institutions of the coordination mechanism. This might help identify the most possible actions that can be integrated into the national drought plans. It can also help detect the gaps or missing actions that are crucial for the implementation of the plan but not yet initiated by any stakeholders.

TABLE 7. SYNONYMS OF DROUGHT IN PROJECTS, PROGRAMMES AND PLANS

Categories	Mitigation action		Drought hazard	
Water resource management	→ Water conservation → Water security → Water management	→ Water supply → Water infrastructure → Soil moisture conservation	→ Rainwater harvesting and catchment → Water planning and governance → Hydrological cycle → Rainfall deficiency → Water stress	→ Groundwater depletion → Water shortage → Loss of wetlands → Decrease of or low water level → Water scarcity
Resilient agriculture	→ Crop tolerance → Irrigation efficiency → Climate-smart agriculture		→ Crop or yield failure → Crop damage → Loss in agricultural production	→ Crop or forage loss → Livestock loss
Climate change and disaster risk reduction	→ Climate resilience → Climate adaptation → Early warning	→ Climate risk management → Hazard mitigation → Response and recovery	→ Dry spell → Heatwave → Wildfire	→ El Niño–Southern Oscillation
Environmental protection	→ Integrated land and water management → Natural resource management	→ Sustainable land management → Ecosystem restoration	→ Ecosystem degradation → Land degradation	
Community empowerment	→ Community resilience → Food security		→ Food insecurity → Food shortage → Malnutrition	
Conflict mitigation and gender-responsive interventions	→ Gender mainstreaming and equality	→ Women's empowerment → Gender-sensitive	→ Migration	
Capacity building, policy advocacy, institutional support and research	→ Resilience → Capacity building	→ Climate research → Climate awareness-raising		

Source: Authors' own elaboration.

8.2. The specific goals of monitoring and evaluation

Essentially, there is a need for all institutions involved in drought management to know what the other institutions are doing, and what institutions beyond their borders are doing in relation to drought. This means conducting monitoring and evaluation of institutional coordination and communication in national drought plans, which is crucial for numerous reasons:

- Assignment of responsibilities: Monitoring and evaluation provide a clear roadmap of responsibility allocation. Action plans of the national drought plans should clearly identify the responsible institutions, implementation milestones, timeframes, indicators, and verification means. As action plans, in general, are implemented by several institutions, the progress can be tracked only if a monitoring and evaluation instrument is operated by the central authority of drought management, in most cases the drought commission.
- Effectiveness assessment: Monitoring and evaluation help assess the effectiveness of institutional coordination and communication strategies within national drought plans. This involves examining whether the planned activities are achieving their intended goals and objectives.
- Identifying weaknesses and gaps: Through monitoring and evaluation, weaknesses and gaps in institutional coordination and communication can be identified. This process allows for a more targeted and informed approach to improving the overall effectiveness of drought response and management.
- Resource allocation: By assessing the performance of coordination and communication mechanisms, decision-makers can better allocate resources. This ensures that resources are directed towards activities and strategies that have proven to be effective, maximizing the impact of interventions.
- Complimentary activities: It is vital to stay abreast of in-country actions, projects and strategies that relate to drought, such as water supply, disaster risk reduction for other hazards, irrigation, agricultural and livelihood resilience, monitoring products, involvement in international projects, etc.
- International developments: Monitoring and evaluation of developments in other countries that could be adopted are useful to improve drought management, such as new technologies, monitoring methods and indices, seed or crop types, policies, legislation, etc.
- Adaptation and learning: Monitoring and evaluation provide opportunities for learning and adaptation. If certain coordination or communication approaches are not yielding the desired outcomes, adjustments can be made in real time, leading to more responsive and dynamic drought management.
- Stakeholder engagement: Understanding how different institutions communicate and coordinate during drought events is essential for effective stakeholder engagement. This knowledge can help in fostering collaboration and partnerships among various stakeholders. The monitoring and evaluation process ensures that the voices and contributions of various actors, including government agencies, NGOs, international actors, and local communities, are considered and integrated. By assessing stakeholder engagement, decision–makers can identify areas for improvement, enhance transparency, build trust, and foster more inclusive and resilient strategies for drought preparedness and response. This iterative feedback loop contributes to the adaptive and responsive nature of national drought plans, ultimately promoting more effective and sustainable drought management.

- International cooperation: Participation in regional collaboration platforms, such as regional organizations, river basin commissions or transboundary water management initiatives, should be monitored and evaluated to improve the effectiveness of sharing information, data, best practices, and lessons learned on drought management. Cross-border collaboration can be enhanced with joint vulnerability assessments, capacity-building activities, and transboundary early warning systems. These would foster cooperation, dialogue, and collective action among countries to address shared drought risks and promote sustainable development in drought-prone regions.
- Plan and policy improvement: Evaluation findings can inform the revision and improvement of national drought plans and policies. This iterative process ensures that policies remain relevant and adaptive to changing conditions (including the development of new infrastructure), technological advancements, and emerging best practices in drought management.
- Accountability and transparency: Monitoring and evaluation contribute to accountability by providing a basis for assessing whether institutions are fulfilling their roles and responsibilities outlined in national drought plans. Transparency is enhanced when the results of monitoring and evaluation are shared with the public and stakeholders, promoting trust and accountability.
- Early warning and response: Effective coordination and communication are crucial for timely drought warnings and responses. Monitoring and evaluation help identify bottlenecks or delays in the communication and coordination processes, allowing for improvements that can enhance the speed and efficiency of responses to drought events.

Clearly, monitoring and evaluation play a crucial role in ensuring the continuous improvement of institutional coordination and communication in national drought plans. By regularly assessing and adjusting strategies based on real-world performance, countries can enhance their resilience and responsiveness to drought events.

8.3. Possible monitoring and evaluation mechanisms

A national drought plan must have a framework or a designated committee to conduct monitoring and evaluation of institutional coordination and communication. Many of the national drought plans involve a subcommittee that is designated to evaluate various aspects of drought management and planning. Examples include the Permanent Executive Secretariat in Côte d'Ivoire which monitors and evaluates all activities; an Evaluation Subcommittee within Ghana's National-Level Committee; and the Evaluation Function Working Group in Tunisia. If it is not already an assigned task, these subcommittees should evaluate institutional coordination and communication. Similarly, if monitoring and evaluation is just one of the responsibilities of a working group, or a team effort with several working groups, this task should extend to institutional coordination and communication.

It is often self-evident which institution should be responsible for which aspects of monitoring and evaluation, though this will vary depending on the country's context. For example, the national meteorological and hydrological services should stay abreast of the latest drought monitoring techniques, technologies, and indices used around the world as well as of the monitoring products produced in-country by other institutions. The UNCCD focal point should monitor and evaluate the transferability of drought management policies and strategies from elsewhere in the world. While regional or local level governments are usually best placed to monitor and evaluate whether coordination and communication are adequate between national-level institutions and people or institutions on the ground. The monitoring and evaluation framework should indicate the responsible institution for the particular monitoring and evaluation roles. Mechanisms and frameworks applied by selected countries are provided here to illustrate the various institutions and working groups involved, the particular monitoring and evaluation actions, and their stated purpose and frequency:

- A responsibility of Côte d'Ivoire's Permanent Executive Secretariat is to monitor and evaluate all activities. One of their roles is to create a detailed set of procedures and gender-sensitive indicators to ensure adequate evaluation of the plan including continuous evaluation, post-drought evaluation, and periodic updating of the plan. Evaluation of the drought plan involves identifying data gaps as well as insufficiencies in adaptation strategies and institutional arrangements. Actions will then be proposed to fill these gaps and insufficiencies. These steps are carried out synergistically with all relevant stakeholders to incorporate feedback and programme ideas from the various stakeholders. To ensure an impartial evaluation, responsibility for the evaluation of the drought plan and the societal response is entrusted to non-profit or non-governmental institutions such as universities or specialized research institutes.
- Tunisia's Evaluation Function Working Group, in addition to carrying out assessments of the damage caused by drought and the cost of the interventions undertaken, is called upon to conduct evaluations of the effectiveness of drought management. The working group then proposes recommendations for improvement which are brought to the overseeing drought commission. This monitoring and evaluation involves liaison with existing consultative bodies such as the National Commission for Sustainable Development, National Council for the Fight against Desertification, National Water Council, National Commission for the Fight against Disasters, and regional councils. The evaluation function working group comprises the General Directorate of Financing, Investments and Professional Organizations, General Directorate of Agricultural Production, Livestock and Pasture Office, General Directorate of Veterinary Services, Cereals Office, National Oil Office, National Institute of Meteorology, National Center for Cartography and Remote Sensing, Regional Commission for Agricultural Development, Directorate of Rural Women within the Ministry of Agriculture, Water Resources and Fisheries, Ministry of Commerce, Ministry of the Environment, Ministry of Health, Ministry of Finance, and Tunisian Union of Agriculture and Fisheries. In addition to post-drought evaluations, an evaluation is conducted at the end of each five–year drought plan cycle. This evaluation examines the possibility of involving new actors and strengthening the institutional organization. The National Drought Plan is then updated by the drought commission for the next five years.

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- Algeria's National Drought Plan prescribes reviewing and revising the plan every five years, or as necessary allowing for sociopolitical and technological developments. This is the responsibility of the risk assessment and monitoring subgroup. The review incorporates an evaluation of the standardization and frequency of communication and information exchange, the content of the exchanges, and the communication protocols. The aim is to identify coordination and communication deficiencies, improve data collection systems, and initiate actions for improvement.
- In Montenegro, the National Drought Plan is periodically reviewed and updated to keep up with environmental trends and to integrate new and more efficient solutions. Even though the timeframe for plan revision is every five years, preparation for the revision is a permanent activity of the Intersectoral Drought Advisory Board, which can give recommendations at any time for approval by the National Drought Authority.

- The Philippines' National Drought Plan includes a summary table of actions to reduce the risk of, better prepare for, and better respond to drought. The actions are grouped according to major themes or challenges, and the relevant clusters and authorities are identified. A monitoring and evaluation system was established through a consultative process with all institutions and sectors involved in the planning and implementation of the drought plan. The activities to be monitored are those listed in the summary table of actions. The National Disaster Risk Reduction and Management Council prepares and guides standardized data collection and analysis tools and approaches for the monitoring and evaluation of these activities, subsequently producing and sharing periodic progress reports with all actors. These progress reports highlight successes and challenges in the implementation of the National Drought Plan and assist in reviewing and updating the plan. The Philippines' National Drought Plan states that regular updates and revisions ensure increased agricultural productivity and sustainability through sustainable agricultural practices; strengthened resilience of water resource management and supply; improved food security, nutrition and delivery of health services; and enhanced drought resilience and preparedness by strengthening the capacity of institutions and drought-affected communities to reduce their risks and vulnerability.
- Monitoring and evaluation of institutional coordination and communication in the Dominican Republic is conducted for management of all hazards with valuable findings that are relevant to drought management, including slowness in the transfer of data and late response by some institutions, receipt of outdated or non-continuous information, ignoring of emails and written requests by some key actors, lack of information flow between governmental and local institutions, and suspension of activities due to extreme events (hurricanes Irma and María). With findings such as these, it is imperative that actions are implemented to correct any communication and coordination shortfalls prior to onset of the next drought.

Establishing a robust monitoring and evaluation framework, ideally with a designated committee, is crucial to assess institutional coordination, communication effectiveness and stakeholder engagement. The monitoring and evaluation process extends beyond in-country actions and projects to international developments that could enhance drought management. Examples from different countries highlight diverse approaches to evaluation, involving research institutions, working groups and advisory boards. Regular evaluations are emphasized, examining coordination deficiencies, updating plans, and incorporating feedback from stakeholders, which all ensure a dynamic and adaptive approach to drought management. ■

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9 Conclusions

Institutional coordination and communication play a pivotal role in effective drought management by facilitating collaboration among government agencies, stakeholders and communities. These guidelines provide comprehensive insights and practical guidance on establishing and sustaining institutional coordination among relevant actors at all levels, drawing from diverse country experiences.

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The guidelines provide a clear direction for establishing a minimum institutional framework. This is crucial because managing drought relies on data and technology and involves coordinating multiple sectors and stakeholders. Some institutions, therefore, are indispensable building blocks of the coordination mechanism. Additional institutions vary based on drought impacts, sectors, location, stakeholder and other context-specific factors. Some well-established coordination models exist to provide best practices and inspire the development of institutional frameworks. Nevertheless, it is crucial to customize these models for the specific country context, considering factors such as the severity of drought risk, type of government, available resources, country size, level of decentralization, affected sectors, and cultural considerations. Another important decision while establishing a framework is the temporal consideration and the required financial resources. These two will define whether a permanent or temporary coordination mechanism is required and its level of integration into existing institutions. To support the decision-making process, the guidelines include a comprehensive list of questions related to the above considerations and categorized into three sets of criteria: resource efficiency, the scale of drought risk and its financial impact, and existing governance structure.

Communication is an essential instrument of the coordination mechanism. Based on this assumption, the guidelines complement the institutional mechanism with communication strategies. Effective drought management requires communication at different levels, from the declaration of drought to the delivery of mass information in non-drought periods. Communication approaches must make use of all potential channels and provide targeted information to different stakeholder groups. Different institutional models have distinct strategies. Once the final setup of the coordination mechanism is selected, corresponding schemes on communication flow must be constructed. The guidelines present the objective and essential ingredients of communication approaches to facilitate the work.

The monitoring and evaluation protocol is an essential tool for a coordination mechanism. Above all, it can assist institutions in coordinating their actions related to drought management, and the development of a protocol can facilitate joint interventions for more efficient operation. These guidelines list possible monitoring and evaluation methods and analyse their desirable functions.

By implementing these guidelines and regularly monitoring and evaluating institutional coordination, countries can enhance their capacities to develop, implement, and review drought plans in line with international standards, ultimately strengthening their resilience to drought events. ■

References

Algeria. *Plan National Secheresse Algerie. Lignes Directrices En Vue De Son Operationalisation,* 2019.

Côte d'Ivoire. *Plan National Secheresse De Côte D'Ivoire 2021–2025.,* 2020.

Disaster Management Centre of Sri Lanka, United Nations Development Programme in Sri Lanka, United Nations Development Programme Regional Centre in Bangkok. 2009. *Sri Lanka National Report on Disaster Risk, Poverty and Human Development Relationship*. Colombo, Disaster Risk Management Centre.

Disaster Management Centre of Sri Lanka. 2023. *Situation report – Sri Lanka, 21st August 2023*. Colombo, Disaster Management Centre. https://www.dmc.gov.lk/images/dmcreports/Situation_Report_on_2023__1692631905.pdf

Ghana. *National Drought Plan*. 2020.

Integrated Drought Management Programme. 2024. The Three Pillars. In: *Integrated Drought Management Programme*. Geneva. [Cited 15 March 2024]. https://www.droughtmanagement.info/pillars/

Kingdom of Eswatini. 2020. *Eswatini National Drought Plan*.

Massaquoi, A. S. 2018. Drought Management Plan: A Contingency Plan for Sierra Leone. Bonn, *UNCCD Global Support Mechanism*.

Montenegro. 2020. *Montenegro National Drought Plan*.

Organization for Economic Co-operation and Development. 2022b. *OECD DAC Rio Markers for Climate. Handbook. The Development Assistance Committee: Enabling effective development*. Paris, Organization for Economic Co-operation and Development. https://www.oecd.org/dac/environment-development/Revised%20climate%20marker%20handbook_FINAL.pdf

Philippines. 2023. *El Niño National Action Plan*.

Philippines. 2019. *National Drought Plan for the Philippines*.

Republic of Moldova. 2020. *National Drought Plan of the Republic of Moldova*.

Republic of Serbia. 2020. *Recommendations for development of the National Drought Plan of the Republic of Serbia*.

Republic of Sudan. 2018. *Sudan National Drought Plan*.

Republic of Zambia. 2020. *National Drought Plan*.

Silva, S. 2024. *Participatory session. Workshop summary at 2nd National Workshop on Establishing Institutional Coordination Mechanism for Integrated Drought Management in Sri Lanka, 5 March 2024*. Colombo, Ministry of Environment.

Southern African Development Community. 2008. *Regional Awareness and Communication Strategy for the Water Sector*. Gaborone, Southern African Development Community (SADC). https://www.sadc.int/sites/default/files/2021-08/SADC_Communication_Strategy_for_Water_Sector_2008.pdf

The Disaster Management Centre of the Ministry of Defense of Sri Lanka. 2024. National Council. Colombo. In: *Disaster Management Centre of the Ministry of Defense of Sri Lanka*, Sri Lanka. [Cited 28 February 2024]. http://www.dmc.gov.lk/index.php?option=com_content&view=article&id=29&Itemid=189&lang=en

Tunisia. 2020. *Plan National Secheresse Tunisie*.

United Nations Convention to Combat Desertification (UNCCD). 2023. *Global Drought Snapshot 2023: The Need for Proactive Action*. Bonn, UNCCD. https://www.unccd.int/sites/default/files/2023-12/Global%20drought%20snapshot%202023.pdf

UNCCD. 2018. *Model National Drought Plan*. Bonn, United Nations Convention to Combat Desertification https://www.unccd.int/sites/default/files/2021-12/Model%20National%20Drought%20 Plan%20Guidelines.pdf

United Nations Geospatial. 2020. *Map geodata [shapefiles]*. New York, USA, United Nations.

United Nations Office for the Coordination of Humanitarian Affairs (OCHA). 2017. *Asia and the Pacific: Weekly Regional Humanitarian Snapshot (16-21 August 2027)*. New York, OCHA.

Wilhite, D. A., Hayes, M. J., Knutson, C., & Smith, K. H. 1999. *The basics of drought planning: a 10-step process*. Nebraska, National Drought Mitigation Center. https://www.droughtmanagement.info/literature/NDMC_basics_drought_planning_10_step_process_1999.pdf

World Meteorological Organization (WMO) and Global Water Partnership (GWP). 2014. *National Drought Management Policy Guidelines: A Template for Action* (D.A. Wilhite). Integrated Drought Management Programme (IDMP) Tools and Guidelines Series 1. Geneva, Switzerland, WMO and Stockholm, GWP. https://www.droughtmanagement.info/literature/IDMP_NDMPG_en.pdf

Zimbabwe. 2020. *National Drought Plan for Zimbabwe*.

Drought has direct or indirect impacts on all aspects of society, the environment and the economy. This multifaceted nature has implications for managing drought events, particularly in coordinating mitigation efforts.

Institutional coordination and communication are vital for drought management as they enable effective collaboration among government agencies, stakeholders and communities. Coordinated efforts facilitate the sharing of information, expertise and resources, leading to more robust risk assessments and drought management plans, improved community engagement, more timely response, and better preparedness for drought events.

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