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Drought management and policy: Changing the paradigm from crisis to risk management

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Abstract: There is increasing concern worldwide about the ineffectiveness of current drought management practices that are largely based on crisis management, i.e., managing disasters. These practices are reactive and, therefore, only treat the symptoms (impacts) of drought rather than the underlying causes for the vulnerabilities associated with impacts. Through the adoption of national drought policies that are focused on risk reduction and complemented by drought mitigation or preparedness plans at various levels of government, the coping capacity of nations to manage droughts can be improved. The time for adopting an approach that emphasizes drought risk reduction, i.e., managing risk, is now, given the spiraling impacts of drought in an ever-increasing number of sectors and the current and projected trends for the increased frequency, severity and duration of drought events in association with a changing climate. This presentation will discuss the principles and objectives of national drought policies and a template for the development of national drought policies for governments as a follow up to the High-level Meeting on National Drought Policies held in Geneva, Switzerland in March 2013. Other follow on activities including the launching of the Integrated Drought Management Programme by the World Meteorological Organization and the Global Water Partnership as well as a series of six regional capacity building workshops on national drought policies will illustrate the widespread adoption of a new paradigm for drought management.

Key words: drought policy; drought planning process; impacts of droughts; drought mitigation actions

1. INTRODUCTION

The implementation of a drought policy based on the philosophy of risk reduction can alter a nation's approach to drought management by reducing the associated impacts (risk). This concept helped motivate the World Meteorological Organization's (WMO) Congress, at its Sixteenth Session held in Geneva in 2011, to recommend the organization of a "High-level Meeting on National Drought Policy (HMNDP)." Accordingly, WMO, the Secretariat of the United Nations Convention to Combat Desertification (UNCCD), and the Food and Agriculture Organization of the United Nations (FAO), in collaboration with a number of UN agencies, international and regional organizations, and key national agencies, organized and held the HMNDP in Geneva from 11 to 15 March 2013. The theme of the HMNDP was "Reducing Societal Vulnerability – Helping Society (Communities and Sectors)."

Concerns about the spiraling impacts of drought on a growing number of sectors, the current and projected increase in the incidence of drought frequency and severity, and the outcomes and recommendations emanating from the HMNDP have drawn increased attention from governments, international and regional organizations, and non-governmental organizations. These impacts, regardless of the setting, can only be partially attributed to deficient or erratic rainfall. Drought is a complex natural hazard, and the impacts associated with it are the result of numerous climatic factors and a wide range of societal factors that define the level of societal resilience. Population growth and redistribution and changing consumption and production patterns are two of the factors that define the vulnerability of a region, economic sector, or population group. Some other factors include poverty and rural vulnerability; increasing water demand due to urbanization; poor soil and water management practices, climate variability and change; changes in land use; environmental degradation; and greater awareness of the need to preserve the integrity of ecosystems. Although

the development of drought policies and preparedness plans can be a challenging undertaking, the outcome of this process can significantly increase societal resilience to these climatic shocks.

2. NATIONAL DROUGHT POLICY: BACKGROUND

Simply stated, a national drought policy should establish a clear set of principles or operating guidelines to govern the management of drought and its impacts. The overriding principle of drought policy should be an emphasis on risk management through the application of preparedness and mitigation measures (HMNDP, 2013; Sivakumar et al., 2013; Wilhite et al., 2014). This policy should be directed toward reducing risk by developing better awareness and understanding of the drought hazard and the underlying causes of societal vulnerability along with developing a greater understanding of how being proactive and adopting a wide range of preparedness measures can increase societal resilience. Risk management can be promoted by encouraging the improvement and application of seasonal and shorter-term forecasts, developing integrated monitoring and drought early warning systems and associated information delivery systems, developing preparedness plans at various levels of government, adopting mitigation actions and programs, creating a safety net of emergency response programs that ensure timely and targeted relief, and providing an organizational structure that enhances coordination within and between levels of government and with stakeholders. The policy should be consistent and equitable for all regions, population groups, and economic sectors and consistent with the goals of sustainable development.

As vulnerability to and the incidence of drought has increased globally, greater attention has been directed to reducing risks associated with its occurrence through the introduction of planning to improve operational capabilities (i.e., climate and water supply monitoring, building institutional capacity) and mitigation measures that are aimed at reducing drought impacts. This change in emphasis is long overdue. Mitigating the effects of drought requires the use of all components of the cycle of disaster management, i.e. monitoring and prediction, planning and mitigation response, recovery, mitigation, and planning, rather than only the crisis management portion of this cycle (impact assessment, response and recovery). Typically, when drought occurs, governments and donors have followed with impact assessment, response, recovery, and reconstruction activities to return the region or locality to a pre-disaster state. Historically, little attention has been given to preparedness, mitigation, and prediction/early warning actions (i.e., risk management) and the development of risk-based national drought management policies that could reduce future impacts and lessen the need for government and donor interventions in the future. Crisis management only addresses the symptoms of drought, as they manifest themselves in the impacts that occur as a direct or indirect consequence of drought. Risk management, on the other hand, is focused on identifying where vulnerabilities exist (particular sectors, regions, communities, or population groups) and addresses these risks through systematically implementing mitigation and adaptation measures that will lessen the risk to future drought events. Because societies have emphasized crisis management in past attempts at drought management, countries have generally moved from one drought event to another with little, if any, reduction in risk. In addition, in many drought-prone regions, another drought event is likely to occur before the region fully recovers from the last event. If the frequency of drought increases in the future, as projected for many regions, there will be less recovery time between these events.

Progress on drought preparedness and policy development has been slow for a number of reasons. It is certainly related to the slow-onset characteristics of drought and the lack of a universal definition. Drought shares the distinction of being a creeping phenomenon with climate change in terms of getting people to recognize changes that occur slowly over a long period of time. These characteristics of drought make early warning, impact assessment, and response difficult for scientists, natural resource managers, and policy makers. The lack of a universal definition often leads to confusion and inaction on the part of decision makers since scientists may disagree on the existence and severity of drought conditions (i.e., the onset and recovery time differences between meteorological, agricultural and hydrological drought). Severity is also difficult to characterize

since it is best evaluated on the basis of multiple indicators and indices, rather than on the basis of a single variable or index. The impacts of drought are also largely non-structural and spatially pervasive. These features make it difficult to assess the effects of drought and to respond in a timely and effective manner. Drought impacts are not as visual as the impacts of other natural hazards, making it difficult for the media to communicate the significance of the event and its impacts to the public. Public sentiment to respond is often lacking in comparison to other natural hazards that result in loss of life and property.

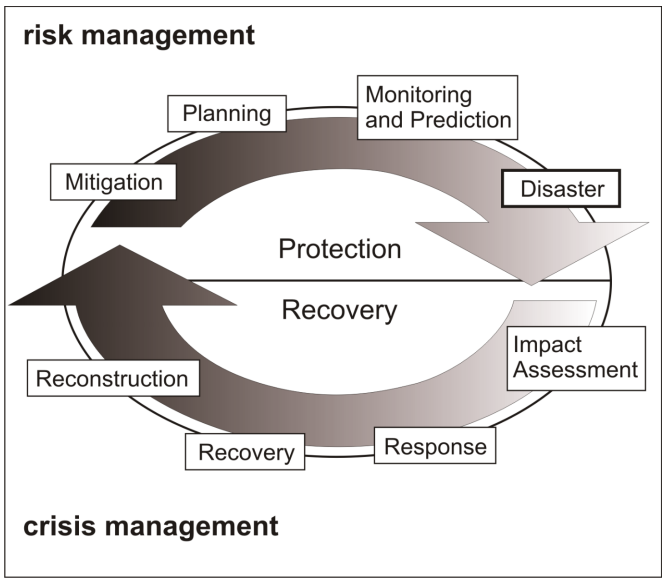

Figure 1. Cycle of Disaster Management. (Source: National Drought Mitigation Center)

Associated with the crisis management approach is the lack of recognition that drought is a normal part of the climate. Climate change and associated projected changes in climate variability will likely increase the frequency and severity of drought and other extreme climatic events. In the case of drought, the duration of these events may also increase and, thus, the period between severe drought episodes which leads to a reduction in recovery time. Therefore, it is imperative for all drought-prone nations to adopt a more risk-based approach to drought management in order to increase resilience to future episodes of drought.

It is important to note that each occurrence of drought provides a window of opportunity to move toward a more proactive risk management policy. Immediately following a severe drought episode, policy makers, resource managers, and all affected sectors are aware of the impacts that have occurred and the deficiencies that existed in the government's response. This is the appropriate time to approach policy makers with the concept of developing a national drought policy and preparedness plans in order to increase societal resilience.

2.1 Drought policy development: A template for action

To provide guidance on the preparation of national drought policies and planning techniques, it is important to define the key components of drought policy, its objectives, and steps in the implementation process. An important component of national drought policy is increased attention to drought preparedness in order to build institutional capacity to deal more effectively with this pervasive natural hazard.

A constraint to drought preparedness has been the dearth of methodologies available to policy makers and planners to guide them through the planning process. Drought differs in its characteristics between climate regimes, and impacts are locally defined by unique economic, social, and environmental characteristics. A methodology developed by Wilhite (1991) and revised to incorporate greater emphasis on risk management (Wilhite et al., 2000, 2005) has provided a set

of generic steps that can be adapted to any level of government (i.e., local, state or provincial, or national) or geographical setting for the development of a drought mitigation plan.

The Integrated Drought Management Program (IDMP) recognizes the urgent need to provide nations with guidelines for the development of national drought management policies (http://www.droughtmanagement.info). To achieve this goal, the drought preparedness planning methodology referred to above has been modified to define a generic process by which governments can develop a national drought policy and drought preparedness plans at various levels of government that support the principles of that policy. A detailed version of this policy development process is provided in IDMP (2014) and, thus, is not described in this paper. The goal of this 10-step process is to provide a template for governments and organizations to follow to reduce societal vulnerability to drought. A national drought policy can be a stand-alone policy or a subset of a natural disaster risk reduction, sustainable development, integrated water resources or climate change adaptation plan that may already exist.

2.2 Drought policy: Characteristics and the way forward

As a beginning point in the discussion of drought policy, it is important to identify the various types of drought policies that are available and have been utilized for drought management. The most common approach followed by both developing and developed nations is post-impact government (or nongovernment) interventions. These interventions are normally relief measures in the form of emergency assistance programs aimed at providing money or other specific types of assistance (e.g., livestock feed, water, food) to the victims (or those experiencing the most severe impacts) of the drought. This reactive approach, characterized by the hydro-illogical cycle, Figure 2, is seriously flawed from the perspective of vulnerability reduction since the recipients of this assistance are not expected to change behaviors or resource management practices as a condition of the assistance. Although drought assistance provided through emergency response interventions may address a short-term need, it may in the longer term actually decrease the coping capacity of individuals and communities by fostering greater reliance on these interventions rather than increasing self-reliance. This reliance on the government for relief is contrary to the philosophy of encouraging self-reliance through an investment in appropriate mitigation actions that can improve drought coping capacity. Government assistance or incentives that encourage these investments would be a philosophical change in how governments respond and would promote a change in the expectations of livestock producers as to the role of government in these response efforts. The more traditional approach of providing relief is also flawed in terms of the timing of assistance being provided. It often takes weeks or months for assistance to be received, at times well beyond the window of when the relief would be of greatest value in addressing the impacts of drought. In addition, those livestock producers who previously employed appropriate risk reduction techniques are likely ineligible for assistance since the impacts they experienced were reduced and therefore do not meet the eligibility requirements. This approach rewards those that have not adopted appropriate resource management practices.

Although there is at times a need to provide emergency response to various sectors (i.e., post-impact assessment interventions), it is critically important for the purpose of moving toward a more proactive risk management approach that the two drought policy approaches described below become the cornerstone of the policy process.

The second type of drought policy approach is the development and implementation of policies and preparedness plans, which would include organizational frameworks and operational arrangements developed in advance of drought and maintained between drought episodes by government or other entities. This approach represents an attempt to create greater institutional capacity focused on improved coordination and collaboration within and between levels of government and with stakeholders in the primary impact sectors and with the plethora of private organizations with a vested interest in drought management (i.e., communities, natural resource or irrigation districts or managers, utilities, agribusiness, farm organizations, and others).

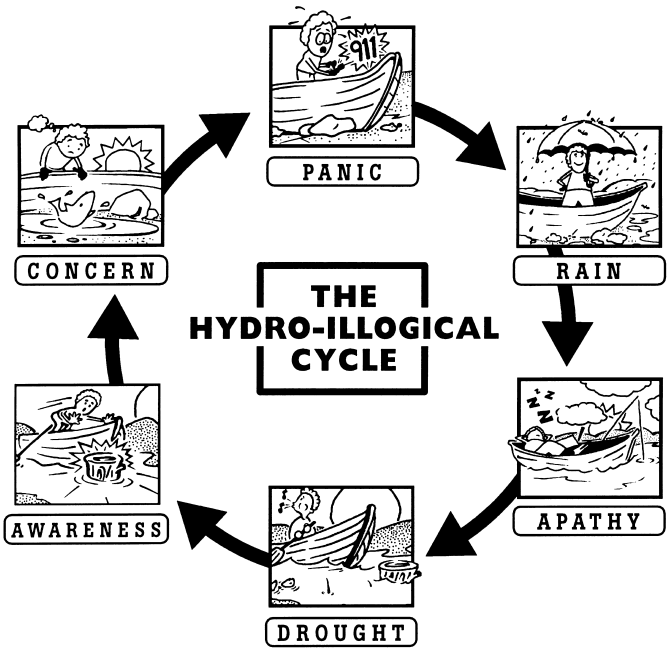

Figure 2. The Hydro-illogical Cycle expressing the typical crisis management approach to drought management. (Source: National Drought Mitigation Center)

The third type of policy approach emphasizes the development of pre-impact government programs or measures that are intended to reduce vulnerability and impacts. This approach could be considered a subset of the approach listed above. In the natural hazards field, these types of programs or measures are commonly referred to as mitigation measures. Mitigation in the context of natural hazards is different from mitigation in the context of climate change, where the focus is on reducing greenhouse gas (GHG) emissions. Mitigation in the context of natural hazards refers to actions taken in advance of drought to reduce impacts in the future. Drought mitigation measures are numerous, but they may be more confusing to the general public in comparison to mitigation measures for earthquakes, floods and other natural hazards where the impacts are largely structural. Impacts associated with drought are generally non-structural, and thus the impacts are less visible, more difficult to assess in a timely fashion (e.g., reductions in crop yield), and do not require reconstruction as part of the recovery process. Drought mitigation measures would include establishing comprehensive early warning and delivery systems, improved seasonal forecasts, increased emphasis on water conservation (demand reduction), increased or augmented water supplies through greater utilization of ground water resources, water reutilization and recycling, construction of reservoirs, interconnecting water supplies between neighboring communities, drought preparedness planning to build greater institutional capacity, and awareness building and education. In some cases, such water resource augmentation measures are best developed jointly with a neighboring state (or country), or at least such measures should be coordinated if they might have an impact on the other riparian state (or downstream use in general). Insurance programs, currently available in many countries, would also fall into this category of policy types.

2.3 Principal elements of a drought risk reduction policy framework

Drought policy should emphasize four principle components during the development process: (1) risk and early warning, including vulnerability analysis, impact assessment, and communication; (2) mitigation and preparedness, including the application of effective and affordable practices; (3) awareness and education, including a well-informed public and a participatory process; and (4) good governance and an effective policy framework, including political commitment and responsibilities (UNISDR, 2009). Another important component of this framework is the inclusion of policy options for emergency response and relief. In all cases, when severe drought occurs,

governments and other organizations must provide some form of emergency relief to those sectors most affected. However, it is crucial, as a part of a drought risk reduction policy, for this assistance to be provided in a form that does not run counter to the goals and objectives of the national drought policy, which would include a strong emphasis on the sustainability of the natural resource base.

3. NATIONAL DROUGHT MANAGEMENT POLICY: A PROCESS

The challenge that nations face in the development of a risk-based national drought management policy is complex. It requires political will at the highest level possible and a coordinated approach within and between levels of government and with the diversity of stakeholders that must be engaged in the policy development process. A national drought policy could be a stand-alone policy. Alternatively, as noted previously, it could contribute to or be a part of a national policy for disaster risk reduction with holistic and multi-hazard approaches that is centered on the principles of risk management.

The policy would provide a framework for shifting the paradigm from one traditionally focused on a reactive crisis management to one that is focused on a proactive risk-based approach that is intended to increase the coping capacity of the country and thus create greater resilience to future episodes of drought.

The formulation of a national drought policy, while providing the framework for a paradigm shift, is only the first step in vulnerability reduction. The development of a national drought policy must be intrinsically linked to the development and implementation of preparedness and mitigation plans at the sub-national level (provincial/state and local). These plans will be the instruments through which a national drought policy is executed.

The 10-step process that is provided below is intended to provide a template or roadmap that countries can follow in the development of a national drought management policy and drought preparedness/mitigation plans at the sub-national level. In other words, the process is not intended to be prescriptive, but rather to be adapted by countries to reflect their institutional infrastructure, legal framework, etc. This process has been modified from a 10-step drought planning process or methodology developed in the United States for application at the state level. Currently, 47 of the 50 U.S. states have developed drought plans, and the vast majority of these states have followed the guidelines provided by the 10-step process in the preparation or revision of drought plans (http://drought.unl.edu/Planning/PlanningInfobyState.aspx). This drought planning methodology has also been followed in other countries in the development of national drought strategies. The process, originally developed in the early 1990s, has been revised numerous times, placing greater emphasis on mitigation planning with each revision. Now, this original methodology has been modified once again to reflect an emphasis on capacity development for a national drought management policy, including the development of drought preparedness plans that are necessary in support of a national policy.

The 10 steps below provide an outline of the process for policy and preparedness planning. As indicated above, the process is intended to be generic, i.e., applying this methodology in each country setting would require adapting it to the current institutional capacity, political infrastructure, legal frameworks, and technical capacity. The reader is referred to a more complete description of this policy development process recently published by the IDMP (2014).

The 10 steps in the drought policy and preparedness process are:

Step 1: *Appoint* a national drought management policy commission

Step 2: *State* or *define* the goals and objectives of a risk-based national drought management policy

Step 3: *Seek* stakeholder participation; *define* and *resolve* conflicts between key water use sectors, considering also transboundary implications

Step 4: *Inventory* data and financial resources available and *identify* groups at risk

Step 5: *Prepare/write* the key tenets of a national drought management policy and preparedness plans, which would include the following elements:

- Monitoring, early warning and prediction
- Risk and impact assessment
- Mitigation and response

Step 6: *Identify* research needs and *fill* institutional gaps
Step 7: *Integrate* science and policy aspects of drought management
Step 8: *Publicize* the national drought management policy and preparedness plans and *build* public awareness
Step 9: *Develop* educational programs for all age and stakeholder groups
Step 10: *Evaluate* and *revise* national drought management policy and supporting preparedness plans

4. SUMMARY AND CONCLUSION

For the most part, previous responses to drought in all parts of the world have been reactive, reflecting what is commonly referred to as the crisis management approach. This approach has been ineffective (i.e., assistance poorly targeted to specific impacts or population groups), poorly coordinated, and untimely; more importantly, it has done little to reduce the risks associated with drought. In fact, the economic, social, and environmental impacts of drought have increased significantly in recent decades. A similar trend exists for all natural hazards.

The intent of the drought policy development and planning process included in this report and referenced (IDMP, 2014) is to provide a set of generic steps or guidelines that nations can use to develop the overarching principles of a national drought policy aimed at risk reduction through a national drought policy commission. This policy would be implemented at the sub-national (i.e., provincial, state or local) level through the development and implementation of drought mitigation and preparedness plans that follow the framework or principles of the national drought policy. Following these guidelines, a nation can significantly change the way they prepare for and respond to drought by placing greater emphasis on proactively addressing the risks associated with drought through the adoption of appropriate mitigation actions. These guidelines are generic in order to enable governments to choose those steps and components that are most applicable to their situation. The risk assessment methodology embedded in this process is designed to guide governments through the process of evaluating and prioritizing impacts and identifying mitigation actions and tools that can be used to reduce the impacts of future drought episodes. Both the policy development process and the planning process must be viewed as ongoing, continuously evaluating the nation's changing exposure and vulnerabilities and how governments and stakeholders can work in partnership to lessen risk.

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