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Essential Elements of National Drought Policy: Moving Toward Creating Drought Policy Guidelines

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Abstract

The development and implementation of a drought policy is intended to alter a nation's approach to drought management. A national drought policy should establish a clear set of principles or operating guidelines to govern the management of drought and its impacts. The policy should be consistent and equitable for all regions, population groups, and economic sectors and consistent with the goals of sustainable development. The overriding principle of drought policy should be an emphasis on risk management through the application of preparedness and mitigation measures. The policy must reflect regional differences in drought characteristics, vulnerability, and impacts. The goal of the policy is to reduce risk by developing better awareness and understanding of the drought hazard and the underlying causes of societal vulnerability.

Climate change and 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. 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. To provide guidance in 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. This paper presents an overview of drought planning and policy that can provide a model for nations to use to improve their level of preparedness for drought with the ultimate goal of reducing societal vulnerability to this pervasive natural hazard

Introduction

Drought results in significant economic, social, and environmental impacts throughout the world. These impacts vary significantly between developed and developing countries. However, a common thread between all countries is the almost total reliance on a reactive, crisis management philosophy for drought management. This approach has been demonstrated to be ineffective and untimely in previous drought response efforts and may actually increase vulnerability to future drought episodes by increasing reliance on governmental or donor assistance.

Associated with the crisis management approach is the lack of recognition that drought is a normal part of the climate. Climate change and 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. 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. To provide guidance in 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. The lessons learned by a few countries that have been experimenting with this approach will be helpful in identifying pathways to achieve more drought-resilient societies.

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, and the one most often 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 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. For example, livestock producers that do not maintain adequate on-farm storage of feed for livestock as a drought management strategy will be those that first experience the impacts of extended precipitation shortfalls. These producers will be the first that turn to the government or other organizations for assistance in order to maintain herds until the drought is over and feedstocks return to adequate levels. This reliance on the government for relief is contrary to the philosophy of encouraging self-reliance through producer investment in creating improved 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.

A second type of drought policy approach is the development of pre-impact government programs that are intended to reduce vulnerability and impacts. 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. These types of measures are numerous but appear to be less obvious to many when associated with drought since impacts are generally non-structural. These measures would include establishing comprehensive early warning systems, improving seasonal forecasts, increasing emphasis on water conservation (demand reduction), increasing or augmenting water supplies through greater utilization of ground water resources, constructing reservoirs, interconnecting water supplies between neighboring communities, drought planning, and awareness building and education. A more exhaustive list of these measures was compiled through a survey of states and other entities in the United States following several drought episodes in the late 1980s and early 1990s (Wilhite and Rhodes 1995). Insurance programs, currently available in many countries, would also fall into this category of policy types.

The final type of policy response is the development and implementation of preparedness plans and policies, which would include organizational frameworks and operational arrangements developed in advance of drought and maintained in 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 plethora of private organizations with a vested interest in drought management (i.e., communities, natural resource districts or managers, utilities, agribusiness, farm organizations, and others).

Principle Elements of a Drought Risk Reduction Policy Framework

Drought policy options should be provided in each of four principle areas: (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) policy governance,

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. It is critically important, 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.

Drought planning, as an integral part of drought policy, can take many forms and approaches. It is important to note that planning must occur on multiple government levels from local to national, and the objectives of these policies at the local, state, or regional levels must reflect the goals of national drought policies. Stakeholders must be engaged at all levels. Drought planning should also occur at the river basin scale, so the result may be overlapping authorities with political jurisdictions.

Drought planning can be defined as actions taken by individual citizens, industry, government, and others before drought occurs with the purpose of reducing or mitigating impacts and conflicts arising from drought. It can take the following forms: response planning or mitigation planning. In the United States, where drought planning at the state level has become widespread over the past 25 years, most state drought plans first began as response plans—i.e., reactive plans that implemented actions when drought emerged, often with the goal of formulating requests for assistance from the federal government, most often the U.S. Department of Agriculture. Over the past 10 years, there has been an impressive shift of emphasis toward mitigation planning by many states. Currently, 47 of the 50 U.S. states have drought plans, and 11 of these states are placing an ever-increasing emphasis on mitigation as a primary means of reducing societal vulnerability. Interestingly, a greater emphasis on mitigation planning has necessarily resulted in increased pressure for scientists to provide more timely information in the form of better seasonal forecasts, improved decision support tools, and higher resolution analysis for natural resource managers, government officials, and policy makers.

One of the tools that has been instrumental in providing guidance in the development of drought preparedness plans in the United States is a 10-step planning process originally proposed in 1991 (Wilhite 1991) and subsequently modified on numerous occasions to incorporate a greater emphasis on mitigation in the planning process (Wilhite et al. 2000; Wilhite et al. 2005a). These steps are listed in Figure 1.

- Step 1** *Appoint a drought task force*
- Step 2** *State the purpose and objectives of the drought preparedness plan*
- Step 3** *Seek stakeholder participation and resolve conflict*
- Step 4** *Inventory resources and identify groups at risk*
- Step 5** *Prepare/write the drought preparedness plan*
- Step 6** *Identify research needs and fill institutional gaps*
- Step 7** *Integrate science and policy*
- Step 8** *Publicize the drought preparedness plan and build public awareness*
- Step 9** *Develop education programs*
- Step 10** *Evaluate and revise drought preparedness plan*

Figure 1. The 10-Step Planning Process (Wilhite et al. 2005a)

In brief, Steps 1-4 of the 10-step planning process focus on making sure the right people are brought together, have a clear understanding of the process, know what the drought plan must accomplish, and are supplied with adequate data to make fair and equitable decisions when formulating and writing the actual drought plan. Step 5 describes the process of developing an organizational structure for completion of the tasks necessary to prepare the plan. The plan should be viewed as a process, rather than a discrete event that produces a static document. A risk assessment is undertaken in conjunction with this step in order to construct a vulnerability profile for key economic sectors, population groups, regions, and communities. Steps 6 and 7 detail the need for on-going research and coordination between scientists and policy makers. Steps 8 and 9 stress the importance of promoting and testing the plan before drought occurs. Finally, Step 10 emphasizes revising the plan to keep it current and making an evaluation of the plan's effectiveness in the post-drought period. Although the steps are sequential, many of these tasks are addressed simultaneously under the leadership of a drought task force and its complement of committees and working groups. These steps, and the tasks included in each, provide a "checklist" that should be considered and may be completed as part of the planning process.

The organizational structure proposed in support of this 10-step planning process is shown in Figure 2. This structure includes the formation of a drought task force to coordinate the drought planning process, both during the development stage and the implementation stage, and a monitoring committee and a risk assessment committee. This structure has worked effectively in most states, although it has been modified or adapted to the specific needs of each of the states with drought plans.

The description of the 10-step process below is summarized from Wilhite et al. (2005a), which is available on the NDMC's website (<http://drought.unl.edu/planning>).

Step 1: Appoint a Drought Task Force

A key political leader initiates the drought planning process through appointment of a drought task force. Depending on the level of government developing the plan, this could be the president or prime minister, a provincial or state governor, or a mayor. The task force has two purposes. First, the task force supervises and coordinates development of the plan. Second, after the plan is developed and during times of drought when the plan is activated, the task force coordinates actions, implements mitigation and response programs, and makes policy recommendations to the governor or other appropriate political leader.

The task force should reflect the multidisciplinary nature of drought and its impacts, and it should include appropriate representatives of government agencies (provincial, federal) and universities where appropriate expertise is available. For states, the governor's office should have a representative on the task force. Environmental and public interest groups and others from the private sector can be included on the task force (see Step 3), as appropriate. These groups would be involved to a considerable extent in the activities of the working groups associated with the Risk Assessment Committee discussed in Step 5. The actual makeup of this task force would vary considerably depending on the principal economic and other sectors affected, the political infrastructure, and other factors. The task force should include a public information official that is familiar with local media's needs and preferences, and a public participation practitioner who can help establish a process that includes and accommodates all stakeholders or interest groups.

Step 2: State the Purpose and Objectives of the Drought Plan

As its first official action, the drought task force should state the general purpose for the drought plan. Government officials should consider many questions as they define the purpose of the plan, such as the following:

- Purpose and role of government in drought mitigation and response efforts;
- Scope of the plan;
- Most drought-prone areas of the state/nation;
- Historical impacts of drought;
- Historical response to drought;
- Most vulnerable economic and social sectors;
- Role of the plan in resolving conflict between water users and other vulnerable groups during periods of shortage;
- Current trends (e.g., land and water use, population growth) that may increase/decrease vulnerability and conflicts in the future;
- Resources (human and economic) that the government is willing to commit to the planning process;
- Legal and social implications of the plan; and
- Principal environmental concerns caused by drought.

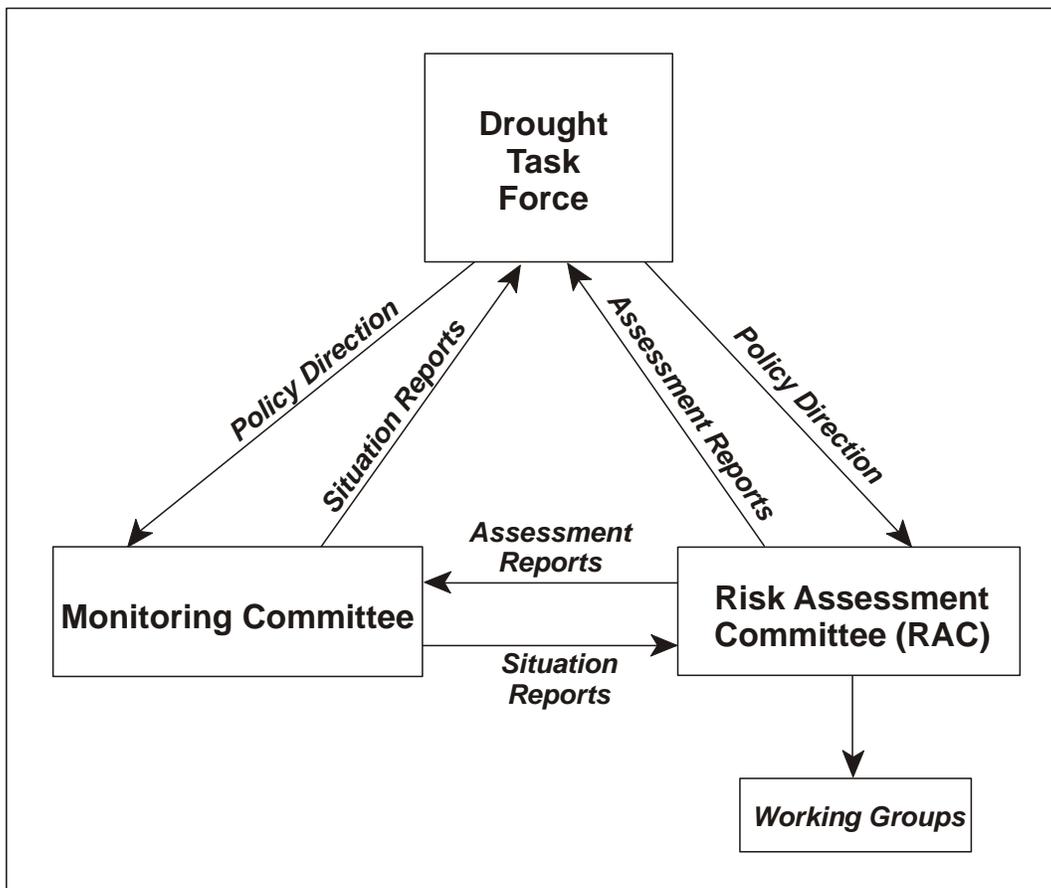


Figure 2. Drought Task Force Organizational Structure (Wilhite et al., 2005a)

A generic statement of purpose for a plan is to reduce the impacts of drought by identifying principal activities, groups, or regions most at risk and developing mitigation actions and programs that alter these vulnerabilities. The plan is directed at providing governments with an effective and systematic means of assessing drought conditions, developing mitigation actions and programs to reduce risk in advance of drought, and developing response options that minimize economic stress, environmental losses, and social hardships during drought.

The task force should then identify the specific objectives that support the purpose of the plan. Drought plan objectives will vary within and between countries and should reflect the unique physical, environmental, socioeconomic, and political characteristics of the region in question. For a provincial, state, or regional plan, objectives that should be considered include the following:

- Collect and analyze drought-related information in a timely and systematic manner.
- Establish criteria for declaring drought emergencies and triggering various mitigation and response activities.
- Provide an organizational structure and delivery system that assures information flow between and within levels of government.
- Define the duties and responsibilities of all agencies with respect to drought.
- Maintain a current inventory of government programs used in assessing and responding to drought emergencies.
- Identify drought-prone areas of the state/region/nation and vulnerable economic sectors, individuals, or environments.
- Identify mitigation actions that can be taken to address vulnerabilities and reduce drought impacts.
- Provide a mechanism to ensure timely and accurate assessment of drought's impacts on agriculture, industry, municipalities, wildlife, tourism and recreation, health, and other areas.
- Keep the public informed of current conditions and response actions by providing accurate, timely information to media in print and electronic form (e.g., via TV, radio, and the World Wide Web).
- Establish and pursue a strategy to remove obstacles to the equitable allocation of water during shortages and establish requirements or provide incentives to encourage water conservation.
- Establish a set of procedures to continually evaluate and exercise the plan and periodically revise the plan so it will stay responsive to the needs of the state or region.

Step 3: Seek Stakeholder Participation and Resolve Conflict

Social, economic, and environmental values often clash as competition for scarce water resources intensifies. Therefore, task force members must identify all citizen groups (stakeholders) that have a stake in drought planning and their interests. These groups must be involved early and continuously for fair representation and effective drought management and planning. Discussing concerns early in the process gives participants a chance to develop an understanding of each other's viewpoints, and to generate collaborative solutions. Although the level of involvement of these groups will vary notably from location to location, the power of public interest groups in policy making is considerable. In fact, these groups are likely to impede progress in the development of plans if they are not included in the process. The task force should also protect the interests of stakeholders who may lack the financial resources to serve as their own advocates. One way to facilitate public participation is to establish a citizen's advisory council as a permanent feature of the drought plan, to help the task force keep information flowing and resolve conflicts between stakeholders.

State or provincial governments need to consider if district or regional advisory councils need to be established. These councils could bring neighbors together to discuss their water use issues and problems and seek collaborative solutions. At the provincial level, representatives of each district council should be included in the membership of the provincial citizens' advisory council to represent the interests and values of their constituencies. The provincial citizens' advisory council can then offer recommendations and express concerns to the task force as well as respond to requests for situation reports and updates.

Step 4: Inventory Resources and Identify Groups at Risk

An inventory of natural, biological, and human resources, including the identification of constraints that may impede the planning process, may need to be initiated by the task force. In many cases, much information already exists about natural and biological resources through various provincial and federal agencies. It is important to determine the vulnerability of these resources to periods of water shortage that result from drought. The most obvious *natural* resource of importance is water; where it is located, how accessible is it, and of what quality is it? *Biological resources* refer to the quantity and quality of grasslands/rangelands, forests, wildlife, and so forth. *Human resources* include the labor needed to develop water resources, lay pipeline, haul water and livestock feed, process citizen complaints, provide technical assistance, and direct citizens to available services.

The task force must also identify constraints to the planning process and to the activation of the various elements of the plan as drought conditions develop. These constraints may be physical, financial, legal, or political. The costs associated with plan development must be weighed against the losses that will likely result if no plan is in place. The purpose of a drought plan is to reduce risk and, therefore, economic, social, and environmental impacts. Legal constraints can include water rights, existing public trust laws, requirements for public water suppliers, liability issues, and so forth.

In drought planning, making the transition from crisis to risk management is difficult because, historically, little has been done to understand and address the risks associated with drought. To solve this problem, areas of high risk should be identified, as should actions that can be taken before a drought occurs to reduce those risks. Risk is defined by both the exposure of a location to the drought hazard and the vulnerability of that location to periods of drought-induced water shortages (Blaikie et al. 1994). Drought is a natural event; it is important to define the exposure (i.e., frequency of drought of various intensities and durations) of various parts of the region to the drought hazard. Some areas are likely to be more at risk than others. Vulnerability, on the other hand, is affected by social factors such as population growth and migration trends, urbanization, changes in land use, government policies, water use trends, diversity of economic base, cultural composition, and so forth. The drought task force should address these issues early in the planning process so they can provide more direction to the committees and working groups that will be developed under Step 5 of the planning process.

Step 5: Establish and Write Drought Plan

This step describes the process of establishing relevant committees to develop and write the drought plan. The drought plan should have three primary components: monitoring, early warning, and prediction; risk and impact assessment; and mitigation and response. It is recommended that a committee be established to focus on the first two of these needs; the drought task force can in most instances carry out the mitigation and response function. The suggested organizational structure for the plan is illustrated in Figure 2.

These committees will have their own tasks and goals, but well-established communication and information flow between committees and the task force is a necessity to ensure effective planning.

More detail on the composition of these committees and their focus is included in Wilhite et al. (2005a) and on the NDMC's website (<http://drought.unl.edu/planning>).

The purpose of the risk assessment process is to identify those sectors, population groups, or regions most at risk from drought, the most likely impacts, and appropriate mitigation actions that will reduce those impacts. The final outcome of this risk assessment process is the development of a vulnerability profile that establishes who and what is at risk and why. The steps in this process are

1. Identify impacts of recent and historical droughts.
2. Identify drought impact trends.
3. Prioritize impacts.
4. Identify mitigation actions that could reduce short- and long-term impacts.
5. Identify triggers to phase in and phase out actions during drought onset and termination.
6. Identify agencies and organizations to develop and implement actions.

A checklist of historical, current, and potential drought impacts is available as a guide to government entities involved in this plan development process (<http://drought.unl.edu/planning>).

Step 6: Identify Research Needs and Fill Institutional Gaps

As research needs and gaps in institutional responsibility become apparent during drought planning, the drought task force should compile a list of those deficiencies and recommend possible remedies to the appropriate person or government body. Step 6 should be carried out concurrently with Steps 4 and 5. For example, the Monitoring Committee may recommend establishing an automated weather station network. Another recommendation may be to initiate research on the development of a climate or water supply index to help monitor water supplies and trigger specific actions by government.

Step 7: Integrate Science and Policy

An essential aspect of the planning process is integrating the science and policy of drought management. The policy maker's understanding of the scientific issues and technical constraints involved in addressing problems associated with drought is often limited. Likewise, scientists generally have a poor understanding of existing policy constraints for responding to the impacts of drought. In many cases, communication and understanding between the science and policy communities must be enhanced if the planning process is to be successful.

Good communication is required between the two groups in order to distinguish what is feasible from what is not achievable for a broad range of science and policy issues. Integration of science and policy during the planning process will also be useful in setting research priorities and synthesizing current understanding. The drought task force should consider various alternatives to bring these groups together and maintain a strong working relationship.

Step 8: Publicize the Drought Plan, Build Public Awareness and Consensus

If there has been good communication with the public throughout the process of establishing a drought plan, citizens may already have better-than-normal awareness of drought and drought planning by the time the plan is actually written. Themes to emphasize in writing news stories during and after the drought planning process could include:

- How the drought plan is expected to relieve impacts of drought in both the short- and long-term. Stories can focus on the human dimensions of drought, such as how it affects a farm family; on its environmental consequences, such as reduced wildlife habitat; and on its economic effects, such as the costs to a particular industry or to the overall economy.

- What changes people might be asked to make in response to different degrees of drought, such as restricted lawn watering and car washing, or not irrigating certain crops at certain times.

In subsequent years, it may be useful to do “drought plan refresher” news releases at the beginning of the most drought-sensitive season, letting people know whether there is pressure on water supplies and reminding them of the plan’s existence, history, and any associated success stories. It may be useful to refresh people’s memories ahead of time on circumstances that would lead to water use restrictions.

During drought, the task force should work with public information professionals to keep the public well informed of the current status of water supplies, whether conditions are approaching “trigger points” that will lead to requests for voluntary or mandatory use restrictions, and how victims of drought can access assistance. All pertinent information should also be available on the drought task force’s website so that the public can get information directly from the task force without having to rely on mass media.

Step 9: Develop Education Programs

A broad-based education program to raise awareness of short- and long-term water supply issues will help ensure that people know how to respond to drought when it occurs and that drought planning does not lose ground during non-drought years. It would be useful to tailor information to the needs of specific groups (e.g., elementary and secondary education, small business, industry, homeowners, and utilities). The drought task force or participating agencies should consider developing presentations and educational materials for events such as a water awareness week, community observations of Earth Day, relevant trade shows, specialized workshops, and other gatherings that focus on natural resource stewardship or management.

Step 10: Evaluate and Revise Drought Plan

The final step in the planning process is to create a detailed set of procedures to ensure adequate plan evaluation. Periodic testing, evaluation, and updating of the drought plan are essential to keep the plan responsive to the needs of the state and its citizens. To maximize the effectiveness of the system, two modes of evaluation must be in place:

Ongoing Evaluation

An ongoing or operational evaluation keeps track of how societal changes such as new technology, new research, new laws, and changes in political leadership may affect drought risk and the operational aspects of the drought plan. Drought risk may be evaluated quite frequently while the overall drought plan may be evaluated less often. An evaluation under simulated drought conditions (i.e., drought exercise) is recommended before the drought plan is implemented and periodically thereafter. Drought planning is a process, not a discrete event.

Post-drought Evaluation

A post-drought evaluation or audit documents and analyzes the assessment and response actions of government, nongovernmental organizations, and others, and provides for a mechanism to implement recommendations for improving the system. Without post-drought evaluations, it is difficult to learn from past successes and mistakes, as institutional memory fades.

Post-drought evaluations should include an analysis of the climatic and environmental aspects of the drought; its economic and social consequences; the extent to which pre-drought planning was useful in mitigating impacts, in facilitating relief or assistance to stricken areas, and in post-recovery; and any other weaknesses or problems caused by or not covered by the plan. Attention must also be directed

to situations in which drought-coping mechanisms worked and where societies exhibited resilience; evaluations should not focus only on those situations in which coping mechanisms failed. Evaluations of previous responses to severe drought are also a good planning aid.

To ensure an unbiased appraisal, governments may wish to place the responsibility for evaluating drought and societal response to it in the hands of nongovernmental organizations such as universities and/or specialized research institutes.

Drought Policy

The development and implementation of a drought policy is intended to alter a nation's approach to drought management. Over the past decade, drought policy and preparedness has received increasing attention from governments, international and regional organizations, and nongovernmental organizations. 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 policy should be consistent and equitable for all regions, population groups, and economic sectors and consistent with the goals of sustainable development. The overriding principle of drought policy should be an emphasis on risk management through the application of preparedness and mitigation measures (Wilhite et al. 2005b). The policy must reflect regional differences in drought characteristics, vulnerability, and impacts. The goal of the policy is to reduce risk by developing better awareness and understanding of the drought hazard and the underlying causes of societal vulnerability. As stated previously, the principles of 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. As vulnerability to 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. Typically, when a natural hazard event and resultant disaster has occurred, 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) that could reduce future impacts and lessen the need for government intervention in the future. Because of this emphasis on crisis management, society has generally moved from one disaster to another with little, if any, reduction in risk. In addition, in drought-prone regions, another drought event is likely to occur before the region fully recovers from the last event.

Drought Policy Objectives

The objectives associated with a national drought policy will, of course, vary from nation to nation but, in principle, will likely reflect some common themes. These objectives would likely

- Encourage vulnerable economic sectors and population groups to adopt self-reliant measures that promote risk management;
- Promote sustainable use of the agricultural and natural resource base; and
- Facilitate early recovery from drought through actions consistent with national drought policy objectives.

In the United States, there has been considerable discussion of drought policy over the past decade, beginning with passage of the National Drought Policy Act of 1998 (Public Law 105-199). This bill

was introduced in Congress as a direct result of the 1996 drought and the initiatives referred to previously. This bill created the National Drought Policy Commission (NDPC) to “provide advice and recommendations on creation of an integrated, coordinated Federal policy designed to prepare for and respond to serious drought emergencies.” The NDPC’s report, submitted to Congress and the president in May 2000, recommended that the United States establish a national drought policy emphasizing preparedness (NDPC, 2000). The goals of this policy would be to

1. incorporate planning, implementation of plans and proactive mitigation measures, risk management, resource stewardship, environmental considerations, and public education as key elements of an effective national drought policy;
2. improve collaboration among scientists and managers to enhance observation networks, monitoring, prediction, information delivery, and applied research and to foster public understanding of and preparedness for drought;
3. develop and incorporate comprehensive insurance and financial strategies into drought preparedness plans;
4. maintain a safety net of emergency relief that emphasizes sound stewardship of natural resources and self-help; and
5. coordinate drought programs and resources effectively, efficiently, and in a customer-oriented manner.

The NDPC further recommended creation of a long-term, continuing National Drought Council composed of federal and nonfederal members to implement the recommendations of the NDPC. The NDPC further recommended that Congress designate the secretary of agriculture as the co-chair of the Council with a nonfederal co-chair to be elected by the nonfederal Council members. An interim National Drought Council was established by the secretary of agriculture following submission of the NDPC report, pending action on a permanent council by the U.S. Congress.

In July 2003, the National Drought Preparedness Act was introduced in the U.S. Congress. The purpose of this bill was “to improve national drought preparedness, mitigation, and response efforts” (National Drought Preparedness Act of 2003 [S. 1454]). The bill authorized creation of a National Drought Council within the Office of the Secretary of Agriculture. Membership on the council was to be composed of both federal and nonfederal persons. The Council would assist in coordinating drought preparedness activities between the federal government and state, local, and tribal governments. A National Office of Drought Preparedness was proposed within the U.S. Department of Agriculture to provide assistance to the Council. The Council was to be directed by the bill to develop a “comprehensive National Drought Policy Action Plan” that:

- delineates and integrates responsibilities for activities relating to drought (including drought preparedness, mitigation, research, risk management, training, and emergency relief) among federal agencies;
- ensures that those activities are coordinated with the activities of the states, local governments, Indian tribes, and neighboring countries;
- is integrated with drought management programs of the states, Indian tribes, local governments, watershed groups, and private entities; and
- avoids duplicating federal, state, tribal, local, watershed, and private drought preparedness and monitoring programs in existence.

Another area of emphasis of this bill is to improve the national integrated drought monitoring system by enhancing monitoring and climate and water supply forecasting efforts, funding specific research activities, and developing an effective drought information delivery system to improve the flow of information to decision makers at all levels of government and to the private sector. A bill to establish a National Integrated Drought Information System (NIDIS) was passed by the U.S. Congress in 2006 (Public law 109-430), and its implementation is continuing under the leadership of the National

Oceanic and Atmospheric Administration (NOAA) in collaboration with other federal partners, national and regional organizations, and states (<http://drought.gov>).

Summary and Conclusion

For the most part, previous responses to drought in all parts of the world have been reactive, representing 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.

This paper presents an overview of drought planning and policy that can provide a model for nations to use to improve their level of preparedness for drought with the ultimate goal of reducing societal vulnerability to this pervasive natural hazard. A 10-step planning process is presented that has been used at all levels of government in the United States and in other countries to guide the development of a drought mitigation plan. The goal of this planning process is to change significantly the way we prepare for and respond to drought by placing greater emphasis on risk management and the adoption of appropriate mitigation actions. The 10 steps included in this process are considered generic in order to enable governments to choose those steps and components that are most applicable to their situation. The risk assessment methodology 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 impacts for future drought episodes. Drought planning must be viewed as an ongoing process, continuously evaluating our changing vulnerabilities and how governments and stakeholders can work in partnership to lessen risk.

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