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INFERENCES OF A DROUGHT MITIGATION ACTION PLAN

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I. Introduction

Drought is a normal phenomenon in all types of climates, but it is more pronounced in dry regions like that of the Near East where its recurrence is even likely to increase in the future, in terms of both frequency and severity. Despite the long time existence of drought, its management is still not optimal because of the way it is generally perceived and misunderstood by policy makers and technicians. During recent years however, a lot of progress has been made, with a major shift from the perception of considering drought as an emergency phenomenon, to long term planning for efficient management. But a lot of efforts are still needed to elaborate and implement drought mitigation plans, for which most countries are still in the need for great help to reduce their vulnerability and build their capacity to combat drought effects in an efficient manner.

When drought hits a country, all or most sectors of its economy are affected, but farmers, herders and the rural population often suffer more than the rest. Generally speaking, the more the economy of a country relies on agriculture, the more its economy is vulnerable to drought. Drought preparedness and mitigation is therefore the concern of all sectors. This paper deals only the perspective of Agriculture in view of its high vulnerability and importance in most countries of the Near East Region. However, comprehensive drought mitigation would also integrate actions other than the ones indicated here, such as the constitution of food reserves, the development of activities that are not affected by drought, etc.

II. What is a drought mitigation action plan

Because of the uncertainty regarding when and where drought will occur, there usually is no preparedness to this phenomenon. As a result, countries have no long-term plans to cope with the issue to which they can only react by providing a crisis management. The decisions taken usually consist of implementing hastily prepared assessments and responses that are ineffective and poorly coordinated within and between institutions and organizations.

Mitigation can be defined as *"a set of programs, measures and actions to be undertaken prior, during and after drought, to reduce its impact and speed up recovery from it."* Wilhite (1999) defined it as *"short- and long-term actions, programs, or policies implemented in advance that reduce the degree of risk to people, property, and productive capacity.*" "*Mitigating the effects of drought means activities related to the prediction of drought and intended to reduce the vulnerability of society and natural systems to drought as it relates to combating desertification* (UNCD; Part I, Article 1.)

In the past, mitigation often meant actions that were taken during or after drought to rehabilitate or remedy the damage made. In the context of this paper, the term is used to refer to the actions taken prior to, during and after drought to minimize its effects and the cost incurred. In this dimension, mitigation includes both proactive elements of drought preparedness and retroactive remedy actions.

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III. Why a Drought Mitigation Action Plan

At the Near East regional level, records show that drought exists somewhere in the region almost every year. On extreme situations, large portions or even the entire region are affected during the same year. Drought is therefore a normal feature of the climate of the Region and will undoubtedly recur with greater frequency in the future, as a result of overall and local climate change, resources degradation, and anthropic activities. As natural resources have degraded substantially over the past thirty years, including substantial reduction in water resources, and with the substantial increase in population, the effects of drought will also become more pronounced. The Intergovernmental Panel on Climate Change (IPCC), in its report on "Climate Change 2001: Impacts, Adaptation and Vulnerability "states that, among the effects of climate change, there will be "rising levels of drought and the spread of deserts, such as the Sahara." The report, which represents nearly three years of work by more that 400 authors from around the world, also says that climate change is expected to increase the number of undernourished people in the developing world.

As a result of the climate change and decreasing water resources per capita, water shortage will continue to recur with greater frequency in the future and drought will become more pronounced. In addition, the conventional solution of building large storage dams is no longer valid in view of the fact that most waters have already been mobilized and the cost of mobilizing the remaining resources is both cost prohibitive and time demanding.

The traditional approach of responding to drought, through the provision of assistance to alleviate the impacts, has proved to have several limitations including the development of a mentality contrary to the spirit of long term, sustainable development. It is now well recognized that the reactive policy of assistance, as a response to any disaster, is a disincentive to long term development and should lead the way to more planned risk management. A more crucial problem is that response to drought often deviates Governments from their regular development programs to provide emergency answers to immediate problems such as food and water shortages. The major issue in putting such emergency programs into place is that no one knows how long the drought will continue. Another risk associated with this way of doing is that such emergency actions do not set priorities for the often limited resources, which in turn impedes the production capacity of land resources upon the off-set of the drought period (no sustainability.)

From the economic standpoint, several studies have shown that preparedness to drought is much more cost-effective than the conventional way of responding to drought as a crisis, following its onset. The management of drought as an emergency after its establishment usually results in spending large capitals only to provide relief to the affected population, with often no impact on long term development. This approach is not only extremely costly but also not effective in reaching equitably the needy areas and people. Planning can reverse the situation whereby drought effects are limited, the needs for assistance are low and the investment profits development as well. Without mitigation measures, drought is often devastating to national economies as it can affect several sectors. Economic losses touch agriculture, natural resources, energy, transportation, tourism, etc. Other important losses that cannot be quantified are incurred through degradation of the environment and social hardship. Societal vulnerability to drought is also increasing with time (See Box 1.)

Technically speaking, the opportunity for a large number of measures exists only prior to drought. This is the case for instance of increasing water storage and supply which effect on reducing drought impact is high, but which can be implemented only prior to the occurrence of drought.

The environment usually suffers great damage as a result of drought, with severe degradation of the natural resource base, necessitating many years for recovery afterwards. With planning, the effects are often minimized and recovery more rapid.

Planning is the key to drought mitigation. Among the key features of planning is that it gives an opportunity for all stakeholders to discuss and reach agreements on what to do and how to do it, before the time of crisis brought about by a drought. Constraints that would otherwise delay implementation of the plan would be addressed and resolved during the contingency planning process. Among the constraints for instance is the absence of an adapted legal framework for implementing drought plans. All such constraints and limitations would be identified during the planning process and lifted in time, prior to the crisis.

IV. Major Ingredients of Drought Mitigation

IV. 1. Policy and Legal Framework

The pre-requisites to successful drought management planning for reduced societal vulnerability, is the development and adoption of a policy on drought. Such a policy, which should have the support of all decision-making levels (national, local, etc.), should also be the pivotal element of national development strategies, particularly the aspects related to water and other natural resources development and management. But its initial step is to recognize drought as a normal, recurrent and inevitable feature of the climate rather than an unusual event.

As in almost all countries of the world, those of the Near East Region have no policy directly related to drought. Countries have often reacted to drought by providing assistance, essentially on an ad hoc basis, as it is the case for other natural disasters. However, such assistance is not considered as a right of the affected population on one hand, and there exists no clear and explicit regulations on the issue on the other. The activities are also often fragmented between several institutions, with no or limited coordination. With time, this way of doing has become a de facto policy on crisis management, with all its limitations and drawbacks.

Box 1

[…] the economic, social, and environmental impacts of drought are the product of both the natural event (i.e., meteorological drought or precipitation deficiencies over an extended period of time) and the vulnerability of society to these periods of precipitation deficiencies. Expressed another way, the impacts of drought are determined not only by the frequency and intensity of meteorological drought but also by the number of people at risk and their degree of risk. Increasing and shifting population, changing trends and patterns of water use, institutional fragmentation, non-sustainable natural resources management policies, and growing environmental awareness and concern all define a future where water will continue to be a primary source of conflict and controversy. Demand for water and other shared natural resources is increasing society's vulnerability to water supply interruptions caused by drought. As a result, future droughts can be expected to have greater impacts, with or without any increase in the frequency and intensity of meteorological drought.

Wilhite, D. A. (2000)

To overcome these limitations, a new vision is needed with a policy that focuses on prior preparedness, with a close linkage between regular development programs and drought mitigation. The policy would also address response to drought in a manner that profits sustainable development and management of natural resources. At the level of each country, it is recommended to establish an integrated national policy that focuses on the key sectors, which may differ from one country to another. The same approach would apply at the level of local governments or communities. Another characteristic of the policy is that it should link between the different levels (government, local authorities, communities, etc.) and accommodate for good coordination of drought management. A synopsis of drought policy in Australia is given in Box 2.

The development of national drought policy and plan should be built on discussion among and consensus of all concerned sectors, institutions and groups of interest that should be convinced of the necessity for such actions. They should further strongly recommend their development and support their implementation.

Priority objectives for drought mitigation policy should be:

1. To recognize that drought is no longer a natural disaster but rather a natural feature of the region's highly variable climate and as a risk of the social and economic development;
2. To orient all resource management practices towards alleviating the effects of drought;
3. To recognize and achieve sustainability of the agricultural resource base and the environment.

The development of policies should not be an end but only the beginning of the process. Additional regulations, mechanisms and structures for implementing and enforcing the policies are also needed as a follow-up. The policy is followed by clear, comprehensive and appropriate legislation targeting drought mitigation. For instance, in the United States where the economy is much less vulnerable to drought than in most other countries of the world, a "National Drought Policy Act" exists since 1997. The regulations should spell out in a clear fashion all aspects related to drought, such as the institutional set-up and their mandates, coordination of the programmes and activities, etc.

IV. 2. Leadership

The leadership for coordinating the preparation of drought mitigation plans and supervising their implementation should rest within a high authority such as that of a Head of State, particularly for formulation of policies and elaboration of the plan. Implementation of activities however are the mandates of all institutions dealing with development in the sectors involved. At the level of local governments or communities, coordination would also be entrusted with an authority that includes representatives from the different sectors and groups of interests. Drought monitoring and decision-making on the time and type of response would be the mandate of the coordinating bodies.

Decentralization is essential for rapid monitoring and response implementation. However, there need for coherence between the various levels (local, district, national institutions, etc.) as well as for coordination between sectors and with regional and international organizations and programs.

Box 2

The Example of Drought Policy in Australia

Australia constitutes a good example of a country that has adopted an integrated national drought policy based on the principles of preparedness, self-reliance and risk management. What makes this example important for the Near East Region is that the policy is focused strictly on agricultural drought on one hand, and the similarity of the climatic conditions on the other. The policy does not consider drought as a natural disaster, but rather as a regular phenomenon or integral part of the climate. By adopting this policy, the Australian Government considers drought as one of the risks that farmers have to face in their regular farming activities. The role of the Government is therefore to assist farmers to cope with the phenomenon. This assistance is provided in several ways including capacity building, monitoring and early warning systems, forecasting, and research on means to minimize or avoid risk. In addition, the Government provides to farmers decision tools, through timely information, to allow them take their decisions.

The objectives of Australian drought policy can be summarized as follows:

To encourage farmers and the rural population to adopt self-reliant approaches in managing for climatic variation,

To facilitate the maintenance and protection of the agricultural and natural resource base, during periods of increasing climatic stress,

To facilitate the early recovery of agricultural and rural industries to levels consistent with long-term sustainable production.

The consequence of this policy that makes drought a normal phenomenon of the climate is that relief measures that protect farmers from climatic risks and/or support unsustainable farming systems are inconsistent with the policy. Hence, they are discouraged and only permitted under exceptional circumstances, particularly droughts of greater than 12 months duration and a recurrence interval of 1 in 20 years. This policy further incorporates incentives to encourage farmers to invest and adopt management practices that accommodate for drought preparedness. On the long run, this policy leads to increased capacity of farmers to sustain themselves through a better productivity and self-reliance, even during drought periods.

VI. 3. Planning

The main objective of a national drought mitigation plan should be the efficient preparation to and management of drought, as a normal feature of the climate. This objective is achieved through the elaboration and implementation of programs on drought monitoring and early warning as well as on the enhancement of preparedness and response to reduce the effects of drought and facilitate rapid recovery from it. As so, the plans are the fundamental bases of both decision-making and intervention for drought management. The plan should also be conducive to better coordination within levels of decision-making as well as between the different sectors of development.

An adequate plan would have two alternatives: One for implementation during normal conditions and a contingency plan for rapid implementation during drought. The former incorporate drought mitigation measures in regular development activities, whereas the latter replaces regular programs and is implemented during drought periods. Substitution of the regular plan by the contingency plan should normally take place in a gradual manner, at well-specified drought severity levels. These two plans or alternatives are not independent, but are closely linked. As an example,

conservation of the available water supplies through good management, during regular periods, results in reduced potential effects of drought and reduced needs for mitigation efforts during drought.

IV. 4. Drought monitoring and early warning

Because of the confusion associated with the definition of drought and the fact that different people often have different perceptions of it, its onset is often unnoticed and its impacts are not detected on time. As a result, reaction to drought is usually late, resulting in greater losses and hardships, and making the cost of emergency and recovery even higher. This situation can be avoided only through well planned monitoring of drought, according to clear and well-defined criteria, applied by trained personnel. Drought monitoring would also serve as the basis for response to which it would be closely linked. Both monitoring and response are to be coordinated by a single agency, under the supervision of a high authority.

Monitoring, also termed drought watch, concerns several variables and parameters (climatic, hydrologic, agronomic, social, economic, etc.), and their evolution in time and space. Each monitored factor should be linked to drought and its extent, through a pre-defined relationship obtained on scientific basis or simply on facts such the flow of a river, the depth of cumulative precipitation, etc. This relationship should also indicate pre-defined threshold values of the monitored factors and parameters that are used as criteria or triggers for drought related actions such as the shift to a contingency plan or the start of water rationing, etc. The entire process of monitoring-early warning-action taking should flow automatically through existing mechanisms and procedures.

Table 1 summarizes the main components in the process of drought preparedness, mitigation and response.

V. Drought Preparedness Plans

From past droughts in the Near East Region and elsewhere in the world, most countries have gained some experience in drought management. In particular, many countries have built substantial capacity in the management of water resources during drought periods, through the elaboration of emergency plans and institutional arrangements established for the occasion to manage water in a more rational manner. Other measures adopted include the establishment of an insurance system for drought. However, the actions are generally not planned and remain fragmented.

The sectors to be involved as well as the respective activities would vary in time and space, both within a country and between countries. From a general perspective, the two main sectors in the Region would be Water Resources and Agriculture with all its sub-sectors (Crop production, Animal Production, Pasture and Range Lands, Forestry, etc.); however, other sectors such as energy, transportation and tourism would also be involved. The economy of the country would also have to accommodate for the foreseen programs and activities. The common ground for all sectors is that all activities should aim at adopting risk management practices to promote self-reliance and protect the natural and agricultural resource base.

Table 1 : Major Steps in Drought Preparedness, Mitigation and Response

Component	Actions and Outputs
1. Drought Policy and Legal Framework	- Elaboration of a Drought Policy, on the basis of: . Review of experience on past droughts and related policy, . Review of existing policies on agriculture & water resources, . Review of legislation on land and water use . Feasibility study of drought policy
2. Assessment and Monitoring	- Setting up of a drought assessment and monitoring system, including: . Factors and parameters to be monitored . Threshold values and indices for drought related actions . Early warning and response mechanisms . Responsibility for action
3. Drought Preparedness Planning	- Plans that incorporate drought mitigation measures in regular development activities . Water resources . Agriculture (Crop production, Range and Livestock, etc.) . Other sectors - Contingency plans for drought periods . Water resources . Agriculture (Crop production, Range and Livestock, etc.) . Other sectors
4. Audit and Evaluation	- Elaboration of a plan for evaluating each drought, auditing response and proposing improvements of Components 1 - 3.

V. 1. Plans that incorporate drought mitigation measures in regular development

The overriding objective is to adapt the technology and all activities to drought conditions, even under normal situations, as a proactive and preparation measure. This includes a very wide range of actions related to all the concerned sectors (water, agriculture, etc.) and of different natures (technical, social, economic, policy-related, etc.) Here also, the starting point is a clear policy that supports the initiative and provides important incentives for activities and technologies that are conducive to the reduction of the risks associated with drought, such as water conservation measures.

V.1.1. Water Resources Management

As the primary concern of drought is water shortage, most mitigation activities aim at reducing the effect of such shortage; but the activities per se comprise a wide range of measures to reduce societal vulnerability that are not necessary linked to water resources. The effective water resources management in drought prone areas hinges on how well efforts are coordinated to address the interrelated issues of water conservation and planning for drought. Because of the close relationship between water resources and drought, drought management is an essential element of the national water resources policy.

Of all mitigation measures, the most effective is improved water management and conservation programs that are conducive to efficient and effective use of water, through staged contingency plans that are implemented in steps as drought severity increases. The available opportunities for further water development include water conservation programs, conjunctive use of surface and ground water, use of non-conventional water such as saline and sewage waters, and improved management and operation of water related projects. The measures that can be taken are of two types: Those related to supply management, aimed at increasing the available water supplies, and those pertaining to demand management, aimed at improving the efficient use of the supplies. Water conservation can be achieved through a wide range of actions or combinations thereof, including:

- Conducting assessment of water supplies, monitoring their quantity and quality and forecasting their variations,
- Encouraging water conservation measures, such as supplementary and deficit-irrigation,
- Improving water use efficiency in agriculture, through improved management,
- Increasing water collection and storage opportunities, for both surface and underground excess water,
- Adopting the conjunctive use of surface and ground water as well as the use of non conventional sources such as brackish water,
- Adopting wastewater treatment and safe reuse,
- Reducing water losses during conveyance and distribution,
- Reducing consumptive use through the introduction of better technology such as modern irrigation systems, using water meters and crops of shorter seasons and/or lower water requirements,
- Training and awareness on water conservation and effective resources management, through media, education and training programs,
- Research and extension on the above measures.

V. 1. 2. Agriculture

a. Crop production

Drought is the most important factor limiting the production of many crops in the Near East Region, especially cereals and fruit crops. It has adverse effects on both yield and quality. Some of the actions that can be incorporated in regular development activities to improve the capacity for dealing with drought are:

- Breeding for drought and heat tolerant varieties (Transgenic plants for stress resistant),
- Breeding for short season varieties,
- Training farmers on the use of appropriate cultural practices and techniques that increase and conserve soil moisture and allow crops to use water efficiently, notably:
  a. Supplementary irrigation,
  b. Adding fertilizers in proper amounts,
  c. No-till and reduced tillage systems,
  d. Cereal-clean follow rotations, or the replacement of follow by feed legumes or food legumes,
  e. Reduction of seeding rates to obtain low plant populations,
  f. Weeding and adapted pest management,
  h. Mulching and adapted soil preparation.

For fruit tree crops:

- Establishing vegetation-free strips under the trees and between tree rows before growth begins in spring,
- Thinning fruit crops properly early in the season,
- Use of water saving irrigation technology; e.g. low-volume drip, trickle and micro sprinkler.

b. Range and Livestock

The problem of feed and fodder shortage are often more difficult to cope with during drought periods that that of food for humans. As the cost incurred for importing feed and fodder is usually high, priority is always given to the imports of food. As a result livestock numbers decrease drastically as result of drought and their recovery often takes several years, which in turn causes famine among herders whose income depends entirely on livestock.

Long term preparedness to drought includes a variety of measures and actions, the most important of which are:

- Development of water resources for livestock,
- Increase the relative number of livestock in the permanently irrigated areas where possible,
- Improve management of rangelands and feed resources from arable agriculture, such as adapting the supportive capacity of lands to livestock,
- Multiplication and wider use of the more appropriate indigenous breeds,
- Research to develop genotypes of mammals that economize water use,
- Develop early warning systems for pastoralists,
- Constitution of feed and fodder reserves, both in-situ and ex-situ, by farmers, cooperatives and government,
- Maintenance of a nucleus herd/flock, including wildlife, on a per animal or ovine unit basis, up to a pre-determined maximum and within the limits of available resources and conservation needs,
- Training livestock owners and pastoralists to cope with drought,
- Introducing and adopting non conventional livestock fodder species that are adapted to drought conditions such as drought tolerant species,
- Providing alternative feed such as by-products of agro-industry,
- Enhance development of water harvesting and storage by pastoral population in range land
- Sowing pasture lands with adapted species of fodder,
- Granting assistance to pastoral population and livestock owners in a manner that ensures conservation of resources,
- Ensuring continuity of production systems.

V. 2. Contingency plans for drought Periods

Contingency plans are developed as the same time as regular development plans. The related projects are also formulated and made ready for immediate implementation upon notification from the monitoring and early warning system. It is also preferable to have their implementation planned in stages, depending on drought severity. Contingency plans have the advantages of targeting feasible and cost effective actions. In addition, they accommodate for relief and rehabilitation when necessary and integrate their usage for long term development. In this manner, such resources not only allow a better response to the affected population than the conventional way of doing, but contribute to long term development and resources sustainability as well.

V. 2. 1. Water Resources

Drought contingency plans need to be developed in close concert with the key stakeholders such as associations of water users, government agencies, local communities and other interest groups. The plans are to be formulated and coordinated first at the national level, then on that of river basins or hydrological regions, then local level. The plans normally highlight the different drought mitigation measures to be implemented, by each level of the hierarchy, at each stage of water supply shortage.

The institutions in charge of developing and implementing these plans have the double role of ensuring their feasibility and administering their effective implementation.

Water resource management during drought requires cooperation at all levels, from the central or state to local communities. The actions undertaken at every level have to respond to the needs of the lower levels, in developing and implementing their emergency and contingency plans. The latter would include, without being limited to, the following action areas:

- Rationing of the available resources,
- Reviewing operation of water sources and reservoirs,
- Reserving contingency sources such as wells,
- Rehabilitating reservoirs and conveyance systems to operate at maximum design capacity,
- Provision of special permits to use water and/or stocking of equipment such as pumps,
- Inventorying of private sources such as wells and negotiating their public use,
- Locating potential new sources, particularly well sites and advising population,
- Providing drilling rigs and accessories,
- Assessing vulnerability and advising water users,
- Assessing risks of shortage and advising farmers before cropping,
- Providing incentives for and recommending water conservation measures,
- Enhancing private investment in water resources supply,
- Elaborating special priorities for water use,
- Encouraging and providing incentives for investment in improved efficiency irrigation systems,
- Elaborating alert procedures for quantity and quality problems,
- Adopting selective water prices against over-use of water,
- Elaborating regulations for the selling of water,
- Establishing a credit system for developing new sources of water,
- Installing water meters to control amounts used,
- Resolving emergency conflicts related to water use and rights,
- Negotiating the purchase of water rights from farmers,
- Reducing or suspending water use rights in vulnerable areas,
- etc.

V. 2. 2. Agriculture

a. Crop production

Upon the on-set of drought, little can be done to save crops that are already in the field, especially when water is not available for irrigation. Some of the actions that can result in saving part of the production are:

- Supplementary irrigation where water can be developed on emergency basis, as part of the contingency plan,
- Adoption of cultural practices that conserve soil moisture,
- Renouncing to putting fertilizers that increase biomass such as Nitrogen,
- Soil mulching and cop shading to reduce evapotranspiration,
- Reducing the crop density,
- Weeding,

b. Range and Livestock

- Providing early warning to herders to sell and reduce their livestock numbers,
- Reviewing available feed resources and reducing the number of animals accordingly,

- Transferring of animals to non affected areas,
- Establishing water hauling for livestock from specified water sources,
- Establishing lists of locations for watering livestock and pastoralists,
- Adjusting water salinity up to the tolerable level,
- Providing incentives for animal owners to reduce the number of animals,
- Organizing offtake of surplus animals and livestock markets and abattoirs to handle surplus production,
- Mapping and inventorying range resources and assessing grazing potentials,
- Establishing protective shelter areas , preferably under natural shading,
- Providing alternative feed such as by-products of agro-industry, less and un-palatable shrubs, etc.,
- Providing proper supplementary feeding,
- Rehabilitate drought affected paste and range lands,
- re-scheduling of payment of loans and their spreading over larger periods to reduce debt burden,
- Provision of additional loans to fund farm/forest or pastoral activities and investment,
- Provision of subsidized feed or transport of stock feed.

VI. Need for a Regional Drought Action Plan and a Drought Information Centre in the Near East Region

In view of the need to consolidate efforts of countries of the Near-East Region to monitor drought and prepare for its mitigation, the creation of a drought watch and information center in the Region is highly recommended. The Centre would have the following mandate and responsibilities:

- Assisting member states in planning and developing national drought policy and action plans and in building their capacity for their implementation,
- Hosting a Regional Council for coordinating between member countries,
- Assembling the principal drought indicators already monitored by different institutions and agencies in and outside of the region,
- Developing a system for making information about drought and drought management easily accessible,
- Synthesizing data and releasing ready-to-use information to decision-makers and other parties such as NGOs, so that timely actions are taken on resources management issues,
- Disseminating information about drought management and developing basic information to help people understand the phenomenon of drought and how to cope with it,
- Organizing regional activities on drought mitigation to enhance the exchange of experience among decision-makers and technicians from the Member States,
- Enhancing and fostering assistance and coordination at the regional level.

The centre is to work closely with policy makers, international and regional organizations, national institutions in member countries and other interested parties to ensure that it is meeting their information needs. It would have a Focal point in every country as well as a regulatory body for participation and management by all countries.

References

- FAO. 1999. Proceedings of the Workshop on Livestock and Drought: Policies for Coping with Changes. Egypt, 24-27 May.

- FAO. 2000. Drought Impact Mitigation and Prevention: Long-term Perspective. Twenty-first FAO Regional Conference for Africa. Yaounde, Cameroon 21-25 February.

- IPCC. 2001. Working Group II: contribution to the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) "Climate Change 2001: Impacts, Adaptation and Vulnerability ". Geneva, Switzerland. 13-16 February.

- United Nations. 1994. United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa.

- Walker, W.R., Hrezo, M.S., and Haley, C.J., 1991, Management of Water Resources for Drought Conditions. *In*: Paulson, R.W., Chase, E.B., Roberts, R.S., and Moody, D.W., Compilers, National Water Summary 1988-89--Hydrologic Events and Floods and Droughts: U.S. Geological Survey Water-Supply Paper 2375.

- White, D.H., and O'Meagher, B. 1995. Coping with exceptional droughts in Australia. Drought Network News, Vol. 7, No. 2, June.

- Wilhite, D. A. 2000. Drought Preparedness and Mitigation: Moving Towards Risk Management. *In*: Proceedings of the Central and Eastern European Workshop on Drought Mitigation. Budapest, Hungary, April 12-15.