INTEGRATED DROUGHT MANAGEMENT PROGRAMME

A Joint WMO-GWP Programme

Concept Note

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SUMMARY OF THE PROGRAMME

Project Title: Integrated Drought Management: Preparedness and Mitigation

Driver: World Meteorological Organization (WMO) and Global Water Partnership (GWP)

Thematic coverage: Climate Change Adaptation in Water and Agriculture

Partners: Intergovernmental, governmental and non-governmental organizations involved in drought monitoring, prediction, drought risk reduction and management[1],

Beneficiaries: Primary beneficiaries are governmental institutions, agencies responsible for developing drought management policies and/or implementing systems for drought monitoring, prediction, preparedness and mitigation. Secondary beneficiaries are the decision-makers and managers whose task it is to implement these policies including mitigation, adaptation; non-governmental agencies involved in global, regional and national advocacy and drought response efforts; and stakeholders vulnerable to drought.

Spatial coverage: Global, but integrated with regional and national programmes

Principal approach: Global co-ordination of efforts to strengthen drought monitoring, risk identification, drought prediction and early warning services and development of drought management knowledge base. Horizontal integration of drought-affected sectors, at regional and national levels. Vertical integration of policy development, drought monitoring, prediction and management and community preparedness and response.

Services provided:

1. Regional coordination of drought monitoring, prediction and early warning activities, serving as interface between the climate service providers and various stakeholders in drought management;
2. Inception of pilot projects and coordination of regional projects to showcase best practices in scientific inputs, policy and planning for drought management and drought risk reduction;
3. Collection and dissemination of information and knowledge on good practices;
4. Guidelines, methodologies, tools and supporting documentation on policy development and management practices and procedures; and
5. Capacity building and advice on Integrated Drought Management.

[1] These other "organizations involved in drought management" will be defined during the first phase of the project. They may include, for example, other UN agencies, governmental and non-governmental organizations, regional centres and centres/institutions of excellence.

1. BACKGROUND

1.1 Problem Statement

Drought events are widely recognized as being a major cause of natural disasters and are a natural occurrence of climatic variability. In recent years, concern has grown world-wide that droughts may be increasing in frequency due to climate change. The Intergovernmental Panel on Climate Change Fourth Assessment Report (IPCC, 2007) states that the world indeed has been more drought-prone during the past 25 years, and that climate projections for the 21st century indicate increased frequency of severe droughts in many parts of the world. Whether due to natural climate variability or climate change, there is an urgent need to develop better drought monitoring and early warning systems, as well as broader social responses to manage the risks and mitigate the effects of drought.

Worldwide, since 1967, drought has been directly responsible for ten of thousands of deaths and indirectly responsible for many millions more (ref). Drought cost hundreds of billions of dollars in the worst dry-spell of the century in Africa in 1991-92, covering a region of 6.7 million square km and affecting about 24 million people (ref). Because of its long-term socio-economic impacts, drought is by far the most damaging of all natural disasters. In many countries and regions, such as in Australia and the Mediterranean region, severe droughts have triggered water sector reforms in order to build greater water security, manage water demand, and safeguard livelihoods. An integrated approach to water resources management, involving stakeholders from the communities and sectors affected by drought, is essential and offers a sound basis for longer-term adaptation to climate change.

1.2 General socio-economic aspects

Frequent occurrence of drought has large adverse consequences on the socio-economic condition of people living in drought-prone areas through their impact on various natural resources such as: water scarcity, land degradation, agricultural production and ecosystems degradation. Where electricity generation depends upon hydropower, the wider economy is also affected by power shortages during droughts. Long-term socio-economic effects of drought are not only expressed in terms of local or regional loss of development potential, but also in terms of irreversible migration of the affected rural population, usually to urban areas.

The UNDP Drylands Development Centre estimates that dry lands are inhabited by over 2 billion people worldwide, i.e. nearly 40% of the world's total population. Empirical evidence shows that incidences of poverty are particularly high in the dry lands, and most countries affected by desertification and drought are among the poorest and most marginalized in the world.

The assessment of long-term socio-economic effects of drought is complicated by the scarcity of reliable statistics. By the year 2025, the population projected to be living in water-scarce countries will rise to between 1.1 and 2.4 billion, representing roughly 13% to 20% of the projected global population (ref). Many of these countries are also experiencing high population growth rates. Non-climatic aspects continue to amplify the severity of drought. In Africa, the Sahel drought was aggravated by over cropping, as well as by socio-political problems and conflict.

The impact of drought on a region depends on the adaptive capacity of communities or the ecosystems to cope. Semi-arid and arid regions generally display strong climate variability temporally and spatially, and they frequently face extremely dry situations. As pointed out above socio-economic changes such as population growth, urbanization, increasing demand for water per capita, or loss of traditional knowledge and practices to adapt to drought, can exacerbate the

vulnerability of particular populations to drought. For instance, pastoralists are among the most vulnerable groups whose needs are rarely reflected in national development policy.

1.3 Need for Intervention

The effects of drought are due both to the physical nature of the hazard, and to society´s ability to manage the associated risks. Droughts have often been dealt with in a reactive manner rather than by applying a pre-emptive management approach that allows the effective use of all available information. Policy development related to national and regional management of drought is generally unsatisfactory and even lacking in most countries. Likewise, drought early warning, consisting of monitoring and prediction, is inadequate in most regions and there is insufficient capacity in many drought-prone countries to use drought prediction results and tools effectively in management practice.

Even when available, the scientific information such as climate services are not fully incorporated into decision making processes. The mitigation actions against drought risks are generally taken through sectoral perspectives and ad-hoc interventions. The fragmentation of responsibilities for actions taken in various aspects of drought management in most countries suffer from insufficient coordination among the organizations and stakeholders concerned. Inadequate institutional arrangements impede stakeholder participation in planning and implementation of drought management and mitigation actions.

There is need for a better understanding of the scientific basis of droughts: their definition, monitoring, impacts, prediction and to bring this knowledge to sectoral experts involved in various aspects of drought management. At the same time, successful experiences in adopting a comprehensive and active approach across various sectors in dealing with droughts should be widely shared, and the capacity to apply such approaches built and developed where needed. The present proposal addresses these issues on one hand and, once implemented, sets up the stage for a possible demand-driven support mechanism for the communities, countries and regions affected by drought. The programme proposes to bring together the UN and other inter-governmental organizations dealing with the climatic, water, land, agricultural and ecosystem aspects of droughts.

2. UNDERSTANDING DROUGHT

Drought is one of the extreme climatic conditions which constitutes an insidious natural hazard that results from a deficiency of precipitation from expected or “normal” that, when extended over a season or longer period of time, is insufficient to meet the demands of human activities and the environment. Drought, a relative, rather than absolute, condition, is a temporary aberration but is a normal part of the climate.

One factor that distinguishes drought from other natural hazards is the absence of a precise and universally accepted recognition of drought conditions. Definitions of drought differ by region and are application- or impact- specific. The spatial extent and severity of drought will vary on seasonal and annual timescales and each region has specific climatic characteristics. Droughts that occur in the North American Great Plains differ from those that occur in Northeast Brazil, southern Africa, western Europe, eastern Australia, or the North China Plain. The amount, seasonality, and form of precipitation received is specific to each of these locations.

Recognition of drought conditions is also application-specific because drought impacts vary among sectors. Drought means different things to a water manager, agricultural producer, hydroelectric power plant operator, and wildlife biologist. Even within sectors, there are many different perspectives of drought because impacts may differ markedly. Droughts can be classified as

meteorological, agricultural, or hydrological droughts and differ from one another in three essential characteristics: intensity, duration, and spatial coverage.

There are numerous natural indicators of drought that should be monitored routinely to determine drought onset, duration, severity and spatial characteristics. Severity must also be evaluated on frequent time steps. Although all types of droughts originate from a deficiency of precipitation, it is insufficient to rely solely on this climate element to assess severity and resultant impacts because of factors identified previously. Effective drought early warning systems must integrate precipitation and other climatic parameters with water information such as stream flow, snow pack, ground water levels, reservoir and lake levels, and soil moisture into a comprehensive assessment of current and future drought and water supply conditions.

A change in the variability of climate, or a trend in any one of its components, may lead to latitudinal and altitudinal shifts in the distribution of terrestrial ecosystems (e.g. rainforests, savannas, steppes). In a given watershed (catchment or basin), these changes might have tangible effects on the water budget and thus on the availability of water resources. Freshwater ecosystems (such as ponds, lakes, wetlands and river channels) are essential components of the environment. They provide support for the existence of aquatic and terrestrial wildlife, environmental goods (e.g. water, foods) and services.

There are both traditional (indigenous) and technological approaches to reducing the risk of drought, and building resilience to its effects. Any technological management of drought requires medium (seasonal) to long-term (annual to decadal) climate prediction and information, to be translated into early warning and response. The response needs to take into account all available water resources including surface water, groundwater, soil moisture, and precipitation. For instance, rainwater harvesting is either a traditional or a highly innovative approach in different contexts.

A common understanding of droughts is essential for its comprehensive management in an integrated approach, addressing the over-all development goals and well-being of the people living in drought-prone areas, and involving the different sectors and stakeholders affected. The mainstreaming of this understanding into development policy and planning needs to be built.

3. THE PROPOSED PROGRAMME

3.1 Context

Due to its frequency of occurrence and the profound impacts associated with drought, countries need to devote more attention to the development of national strategies to reduce its economic, social, and environmental consequences. Critical components of such strategies are:

- A scientific and evidence-informed basis to proposed interventions;
- A comprehensive policy framework at both national and regional levels to tackle droughts;
- A cross-institutional arrangement whereby water, land, agriculture and ecosystem issues are tackled jointly;
- A national and regional framework for drought monitoring, early warning and response.

In the past, drought mitigation has been reactive, resulting in inefficient allocation of water and avoidable economic losses. Within the water sector, planning for short-term response to drought had previously involved water authorities placing ad hoc restrictions on water use. Efficient planning necessitates establishing in advance both short and long-term responses across sectors to meteorological, agricultural and hydrological droughts. Improvements in weather and climate forecasting capabilities and derived drought monitoring and prediction provide the information base for such practices.

A comprehensive drought monitoring system needs to provide a complete understanding of the drought risks, early warning of a drought's onset and end, determine its severity, and deliver that information to a broad group of stakeholders in many climate- and water-sensitive sectors in a timely manner. With such information and services, the impacts of droughts can be reduced in many cases. With the threat of climate change amplifying the frequency and severity of droughts, the latest knowledge and capacities in climate science need to be translated into operational products and services to stakeholders. This will enable countries to enhance their capacities in climate-related risk management. In this context, integrated drought management can be seen as an adaptation strategy to climate change.

The successful model of the existing WMO/GWP Associated Programme on Flood Management serves to illustrate the integrated approach to risk management, albeit tackling a problem of a very different nature, by taking into account the scientific, engineering, environmental, social, institutional and legal aspects of the flood issue. Over ten years the programme has established well-recognized flood management guidelines as well as a demand-driven mechanism, the HelpDesk, to work with countries and stakeholders in reducing flood risks and mitigating flood impacts. It is envisaged that the lessons learned and the experiences of this joint programme will inform the development of the proposed new programme on drought management.

The active involvement and collaboration of a number of institutions will be essential for this Integrated Drought Management Programme to succeed in creating a responsive and demand-driven process. The Programme will be implemented through the major international institutions dealing with land, water, agriculture and ecosystems, co-ordinated through the World Meteorological Organization, working together with the partner organizations within the network of the Global Water Partnership. The institutions include, but are not restricted to:

- Food and Agriculture Organization (FAO)
- UNDP Drylands Development Centre
- United Nation Convention to Combat Desertification (UNCCD)
- International Strategy for Disaster Reduction (ISDR)
- ReliefWeb (UN Office for the Coordination of Human Affairs (OCHA))
- U.S. National Drought Mitigation Center (NMDC) at the University of Nebraska and other academic institutions working on drought and drought-related issues
- Regional Drought Monitoring Centres

3.2 Beneficiaries

The proposed activities, including policy advice, aim to increase the resilience of societies to drought events. Consequently, populations in drought prone areas, which in many cases belong to the poorer strata of society, are the ultimate target groups for the Programme. On the planning and implementation level of the proposed Programme, three distinct groups of beneficiaries are addressed:

(a) Governmental organizations and agencies with improved capacities in the development and implementation of national drought policies, management (including land, water and agriculture development) and preparedness plans including monitoring and prediction;
(b) Regional and national organizations, agencies and institutions engaged in monitoring, prediction, and providing early warning of drought and taking preventive actions;
(c) Non-governmental organizations and government agencies responsible for the implementation of drought response activities at various levels.

4. DESCRIPTION OF THE PROGRAMME

4.1 Scope and Objective

The wider scope of the Programme is to alleviate poverty in drought-affected regions of the world through an integrated approach to drought management cutting across sectoral, disciplinary, and institutional jurisdictions. As a response to the perception of the drought problem and its complex

cross-sectoral impacts, particularly the water, land, agriculture and ecosystems, the objective of the Programme is:

To provide policy and management guidance through globally coordinated generation of scientific information and sharing best practices and knowledge for drought management.

The proposed Programme will contribute to the global coordination of drought-related efforts of existing organizations and agencies with regard to:

- Better scientific understanding and inputs for drought management;
- Drought risk assessment, monitoring, prediction and early warning;
- Policy and planning for drought preparedness and mitigation across sectors; and
- Drought risk reduction and response.

While the spatial scope is global, the results are expected to be policy relevant and tailored to specific regional and national needs and requirements. The intent is to facilitate actors and partners in various sectors, disciplines, and institutions to provide better drought monitoring and prediction on a global and regional basis, and to use it effectively in the development of short-term and long-term drought management plans and actions. The overarching approach proposed for the Programme centers around four key principles:

- To shift the focus from reactive to proactive measures through mitigation, vulnerability reduction and preparedness;
- To integrate the vertical planning and decision making processes at regional, national and community levels into a framework of horizontally integrated sectors and disciplines (such as agriculture, water management);
- To promote evolution of a knowledge base and establishing mechanisms through dialogue for sharing it with stakeholders across sectors at all levels;
- To build capacity of various stakeholders at different levels.

Drought planning and management within the scope of the Programme will incorporate an three-stage approach involving development of comprehensive drought response plans, short-term planning, and long-term drought planning guidelines. The proposed integrated approach places emphasis on governments working with a range of stakeholders to improve risk management practices, reduce vulnerability and build resilience of water users in various sectors (farmers, water supply operators, urban areas etc.) to cope with drought situations. The approach will involve vulnerability analysis for effective targeting of efforts, and will also integrate farm productivity, soil and water protection, and financial management aspects. Sub-programmes may need to be introduced to improve drought monitoring, identify knowledge gaps and areas for further research on drought-related subjects, and support drought extension services.

4.2 Outputs (Deliverables) of the Programme

The major output from this Programme will be a coordinated global framework for drought management, prediction and monitoring integrating existing programmes and activities worldwide. This framework will be accompanied by a set of guidelines and tools for the development of sound and appropriate drought policies and management plans for use by countries and the improved use of drought prediction services. In addition, capacity building will be an important aspect of the Programme.

The drought management guidelines will include tools for action as well as case studies demonstrating the value of the integrated process. In particular, the following outputs are envisaged:

1. Coordination of regional activities on a global scale in the context of Integrated Drought Management;
2. Compilation of information and knowledge on past droughts and recorded practices in drought planning and management;

3. Technical as well as managerial and institutional guidance through a series of techniques, tools and methodologies;
4. Advocacy and specific recommendations for implementing a new integrated approach to drought management;
5. Stakeholder buy-in for the integrated drought management approach through regional and country dialogues;
6. Improved drought early warning services as demonstration projects in certain regions, including monitoring and prediction and application of drought prediction products, building upon existing regional initiatives;
7. Mechanisms for stakeholders to gain entry to processes and access to information through establishment of drought action networks for these regions; and
8. Establishment of an online Drought HelpDesk to respond to expressed needs for assistance in drought risk assessment, monitoring, prediction, early warning, preparedness and mitigation.

4.3 Impacts

The programme is expected to have substantial impacts in the long term as well as short term on the following:

- Potential for poverty alleviation by focusing on preventative and response strategies in the drought-prone areas;
- Enhanced resilience of economies and societies to the incidents of droughts;
- Improved climate, water and agriculture information on droughts and drought management and climate change adaptation;
- Effective use of information by those responsible for drought policy development and management in the broadest sense, including those concerned with emergency response, as well as operation of engineering works (such as reservoirs) and water supply systems;
- A multi-disciplinary approach to drought management through land, water, and agriculture perspectives;
- Use by countries of an improved approach and new tools for drought management supporting land, water and agriculture through Integrated Water Resources Management (IWRM);
- Ensured coordination and scientific back-up to regional drought management projects;
- Cross-fertilization of ideas and experience between regions, so that success achieved in one way be applied in others;
- Potential for improved coordination of international assistance and response to actual drought events;
- Stakeholder participation and buy-in through networks in drought management from policy to implementation;
- Better capacities in countries to adapt to the increasing number of droughts due to climate change, and robust mechanisms for dealing with regional and transboundary aspects;
- Coordinated building and development of drought management institutions at global, regional and national level (through the identification of experts and centres of excellence) and sharing of knowledge and common practices.

5. ACTIVITIES IN THE PROGRAMME PHASES

The Programme will be undertaken in two phases: an **Inception Phase** which includes a preparatory phase of nine months, followed by an **Implementation Phase**, initially extending over four years. The detailed programme strategy, work plans and budget for the Implementation Phase will be developed during the Inception Phase. Continuation of the Programme beyond the initial four years of the Implementation Phase will be reviewed by the appropriate bodies and partners one year before the period ends.

5.1 Inception Phase

The following activities are planned for the Inception Phase of the Programme:

(a) Close consultations with relevant intergovernmental and non-governmental organizations active in the field of drought early warning, policy development and management (land, water and agriculture) through an inception workshop.
(b) Identification of potential partners working in drought management issues so as to identify and build on their strengths, seeking ways to serve their needs and obtain their commitment, and agree their roles in the Programme in order to cover the necessary scientific, policy, socio-economic, advocacy and the institutional aspects involved.
(c) An extensive enquiry will be commenced to assemble comparable information on past droughts and drought-related disasters, both as regards their physical characteristics and their impact on the local economy and society.
(d) Review of services of drought monitoring and prediction centres and assessment of the effectiveness of the services provided, including operational as well as technical aspects.
(e) Regional dialogues will be held in certain regions in order to build upon existing regional initiatives in drought management, preparedness and mitigation, and to create buy-in by regional stakeholders into the Programme.
(f) Development of concept of demonstration projects in consultation with regional partners or the regional nodes.
(g) The information will be used to prepare an inception report including a detailed programme strategy, work plans and budget for the Implementation Phase of the Programme.
(h) The inception report will also describe the current status of the regional programme nodes and the linkages between the global, regional and national levels.

5.2 Implementation Phase

Activities in the implementation phase would be taken up under following categories:

(a) The activities commenced under (a) to (f) of the Inception Phase will be continued and completed during this Phase.
(b) A broadly comprehensive and integrated approach to drought management will be developed, with the emphasis on socio-economic aspects, taking into account global changes and challenges.
(c) A catalytic and pro-active role will be played in facilitating the development of regional activities under the programme and in coordinating existing and new regional projects.
(d) Pilot studies will be undertaken, in cooperation with relevant regional groups, to apply the new approach to drought management, provided the funds are available. Initially these would be in different regions and with different aspects of drought issues (e.g. climate information, water supply drought – groundwater etc.)
(e) Efforts will be made to obtain funding to implement the plans developed for each of the locations; some may require substantial capital investment, while others may focus more on legislative and regulative action.
(f) Experience with drought planning and management in each region will be collected, including that gained in the above projects, and made available in the form of guidelines, methodologies and tools for use in other regions.
(g) A resource and information centre will be established on the subject, with an online interface called a HelpDesk. Where requested the centre can support transboundary “hot spots”, and encourage the establishment of multi-lateral drought management agreements, all within the context of IWRM.
(h) An operational link will be maintained with the IWRM information community and the GWP ToolBox, so that, on the one hand, maximum use can be made of existing practices and techniques and, on the other hand, lessons learnt and new techniques developed are fed back into the community for wider dissemination.

(i) The above centre could act as a focus for international coordination and assist drought prone communities and donors to work together to minimize drought impacts and respond to the threat and reality of droughts.
(j) One year before the end of this phase, a study will be undertaken as to the desirability and feasibility of extending the Programme.

6. MANAGEMENT OF THE PROGRAMME

The guiding principle in the management of the Programme will be its fully participatory and transparent approach, giving full credit to all collaborating organizations, agencies and their activities that contribute to the objectives of the proposed Programme. While the details of the overall oversight and technical guidance will be worked out during the consultation with various partners during the inception phase, it is envisaged that there will be an International Management Committee and an Advisory Committee to steer and guide the overall implementation. Membership of this committee will comprise of representatives of collaborating partners and technical experts, the latter being invited on an ad-hoc basis.

The Programme will seek coordination with other relevant international initiatives with the aim of avoiding duplication of effort and build synergies. Related national, regional and global projects/activities will need to be taken into consideration and will be identified during the Inception Phase. The Global Water Partnership through its Regional Water Partnerships will guide and assist in developing the regional linkages of the Programme.

A Technical Support Unit (TSU) will assist the inception and technical implementation of the Programme. The World Meteorological Organization (WMO) has long-standing expertise and activities in the field of drought prediction and management. WMO further maintains close links to the national agencies and regional centers responsible for meteorological forecasts including regional climate centers, drought prediction centers and agencies responsible for drought preparedness including meteorological, hydrological and agricultural agencies. In addition, WMO is a partner in several programme-relevant intergovernmental processes of the United Nations System. It is proposed, therefore, that the TSU be located within the WMO Secretariat in Geneva, thus providing synergies with existing initiatives in climate, water and agriculture.

Given the important role played by the professional associations it is planned that intergovernmental and non-governmental organizations involved in aspects of drought planning and management act as partners of the Programme through a consortium of institutions of excellence on a voluntary basis. These will be identified during the Inception Phase of the Programme. The involvement and collaboration of a number of UN and NGO partners will be essential for this Programme to succeed. Involvement of these organizations will be investigated and discussed with them during the inception phase. The institutions include, but are not restricted to the ones already mentioned in section 3.1.

A principal tool for global coordination will be an institutionalized dialogue between the Programme partners using various media and communication platforms to ensure up-to-date information about on-going and planned activities and consultations with regard to joint and multilateral activities in drought management. The development and implementation of regional dialogues and demonstration projects focusing on drought management will be a particular interest of the Programme and facilitate multi-lateral and global collaboration.

7. CONCLUSIONS

Drought and poverty are linked in a self-amplifying cycle that can only be disrupted by practically applying the principles of Integrated Water Resources Management. The Integrated Drought Management Programme aims to provide an objective-oriented framework for the monitoring, prediction and management of drought as a globally coordinated approach which can be effective on regional, national and community levels.

In this respect, the concept of policy planning and management of drought needs to evolve in recognition that drought is a naturally occurring and recurrent phenomenon, likely to increase in frequency as a result of climate change. Science is in a position to be able to predict the onset of such events with an increasing precision, a capacity that needs to be appropriately factored into reducing drought risks and mitigating its impact on the environment as well as on socio-economic activities, within broader strategies for climate change adaptation.

The proposed Programme provides the platform and mechanism to enhance drought management capacities in a coordinated, pro-active and responsive manner based upon improved drought prediction and monitoring services, and the collaboration of a multitude of partners representing all relevant sectors in drought management.
