

# Drought conditions and management strategies in KENYA

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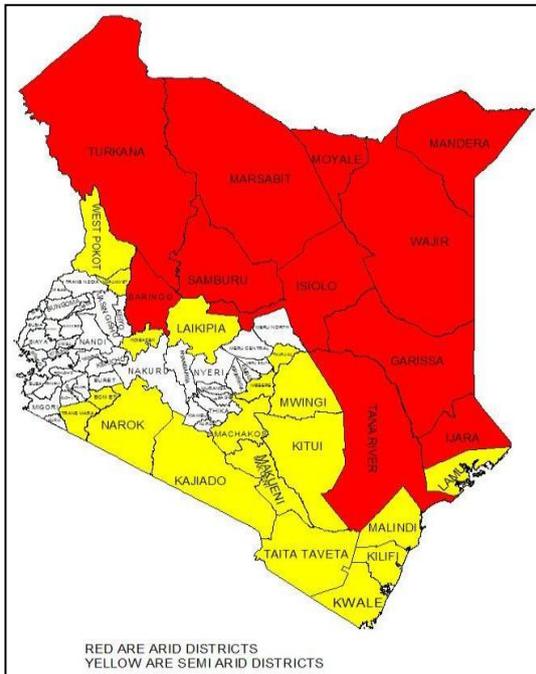
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## 1. Background:

Kenya has been stricken by various disasters. The most dominant disasters being; droughts, floods, fire, terrorism, technological accidents, diseases and epidemics that disrupt people's livelihoods, destroy the infrastructure, divert planned use of resources, interrupt economic activities and retard development.

Kenya is a highly drought prone country, because of its peculiar eco-climatic conditions as



only about 20% of the territory receives high and regular rainfall. The rest, i.e. 80% of the territory, is arid and semi-arid lands where annual rainfall varies from 200 to 500 mm, and periodical droughts are part of the climate system.

Droughts in Kenya adversely affect all sectors of the economy and the population at large. This is because it: i) affects water supply in both rural and urban areas, ii) leads to reduced hydropower generation and power rationing, iii) causes crop failures and reduced food security, iv) causes deaths of humans, livestock and wildlife, v) leads to job losses when industries shut down as resources get depleted, vi) causes the deterioration of human health due to malnutrition and poor access to quality water and vii) causes conflicts between communities and wildlife. The scorching effect of droughts also leads to environmental

Figure 1: Kenya Arid and Semiarid Lands

degradation – desertification and bio-diversity loss.

The root cause of the country's vulnerability to drought is in **its dependence on rainfall** for its economic and social development. **Agriculture**, the mainstay of the economy, is almost entirely rain-fed. **Water for human consumption** and other uses is derived from rivers whose recharge depends on rainfall. Kenya is a water scarce country, whose per capita water availability is one of the lowest in Africa, making access to clean water a problem in many areas of the country, including the capital, Nairobi. Recent droughts (especially in 2000) exposed the risk this entails - when drastic power rationing was imposed, the Kenya Power Company lost US \$20 million, the economy was paralyzed and the national GDP contracted by 0.3% (Kandji, 2006).

In recent years, Kenya experienced severe droughts, associated with major food crises, in the following years:

- a) **1997**: a severe drought threatened the livelihoods of 2 million people;
- b) **2000**: 4 million people were in need of food aid after Kenya was hit by its worst drought in 37 years;
- c) **2004**: the long rains (March–June) failed and the subsequent crop failure left more than 2.3 million people in need of assistance;
- d) **2005**: another “national catastrophe” was declared in reference to the famine that affected 2.5 million in northern Kenya;
- e) **2010/2011**: worst drought in 60 years. Affected 13.3M people in Kenya , Ethiopia and Somalia (Mwangi E., 2012)

Droughts are generally associated with the failure of the seasonal rains. The two major rainfall seasons in Kenya are the long-rains (March to May, MAM)) and the short rains (October to December, OND). Impacts of drought are demonstrated in the photographs below;



Figure 2 many livestock watering at few remaining sources –Dabacity

Figure 3 Dried water pan at Shimbir Fatuma



Figure 4 a, b & c; People trek long distances for water while starvation takes toll before cattle reach the market (photos, E. Mbogo)

## 2. Drought Monitoring and Early Warning Systems

The Greater Horn of Africa (GHA) is highly prone to extreme climate events such as droughts and floods. These extreme events have severe negative impacts on key socio-

economic sectors of all the countries in the sub-region.

In order to address this challenge, heads of state and governments of the Intergovernmental Authority on Development (IGAD) held their 10<sup>th</sup> Summit in Kampala, Uganda where the existing Drought Monitoring Centre with its headquarters in Nairobi (DMCN) was adopted as a specialized IGAD institution. The name of the institution at the same time changed to IGAD Climate Prediction and Applications Centre (ICPAC) in order to better reflect all its mandates, mission and objectives within the IGAD system. The protocol integrating the institution fully into IGAD was signed on 13 April 2007.

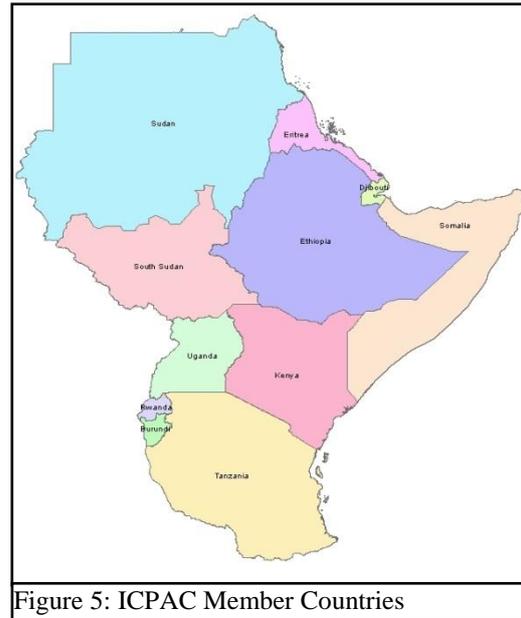


Figure 5: ICPAC Member Countries

The Centre is responsible for the eleven IGAD member countries, namely Djibouti, Eritrea, Ethiopia, Kenya, Somalia, Sudan, South Sudan, Uganda, Burundi, Rwanda and Tanzania. It works closely with the NMHSs of member countries as well as regional and international centers for data and information exchange.

**Its objectives** are:

- i. To provide timely climate early warning information and support specific sector applications for the mitigation of the impacts of climate variability and change for poverty alleviation, management of environment and sustainable development;
- ii. To improve the technical capacity of producers and users of climatic information, in order to enhance the use of climate monitoring and forecasting products in climate risk management and environment management;
- iii. To develop an improved, proactive, timely, broad-based system of information/product dissemination and feedback, at both sub-regional and national scales through national partners;
- iv. To expand climate knowledge base and applications within the sub-region in order to facilitate informed decision making on climate risk related issues; and
- v. To maintain quality controlled databases and information systems required for risk/vulnerability assessment, mapping and general support to the national/ regional climate risk reduction strategies.

The main climate information products from ICPAC are issued in the form of regular bulletins:

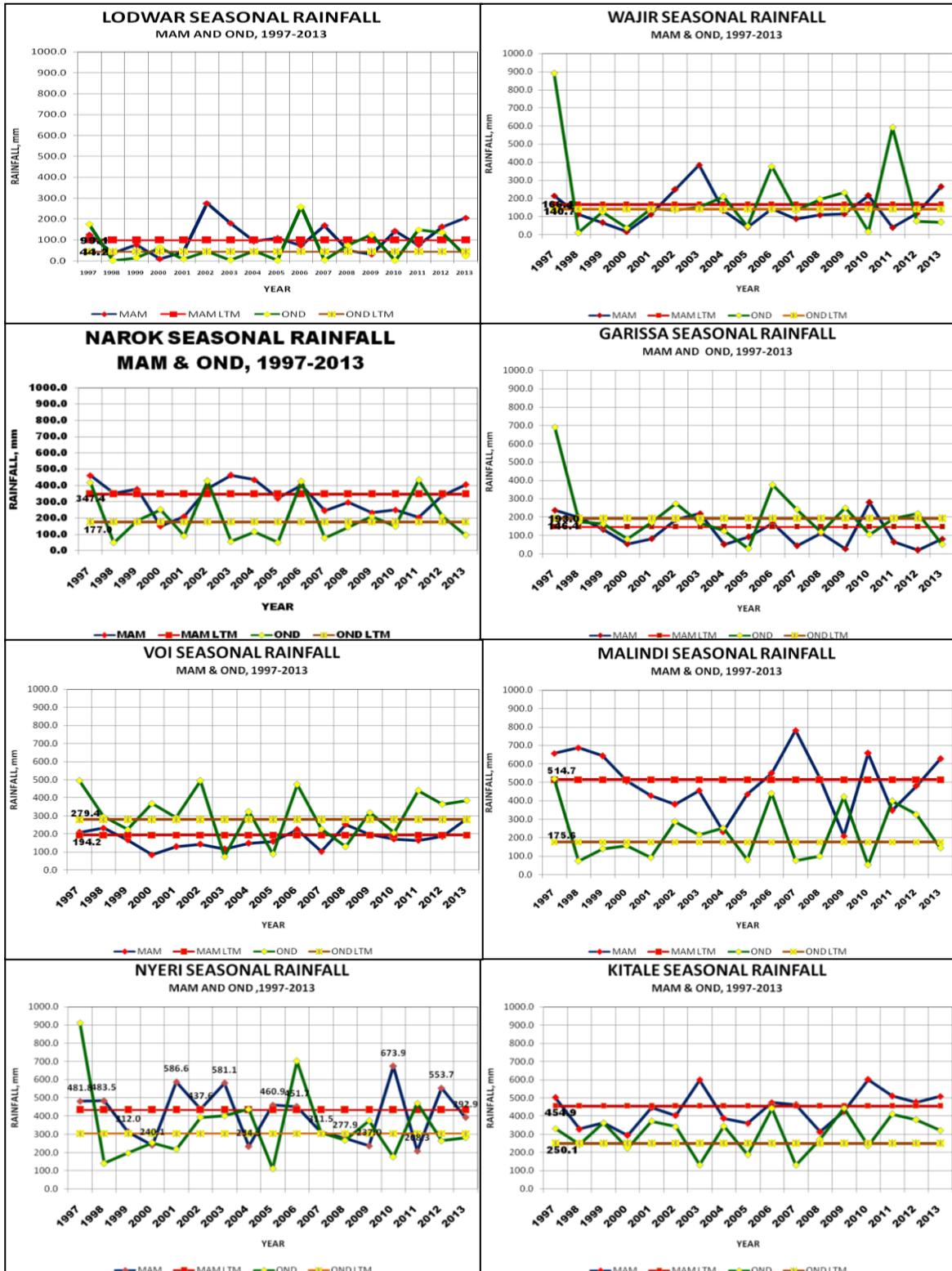
- Ten day, monthly and seasonal climate/ weather bulletins
- Climate watch/ El Niño updates
- Annual climate summaries

**Drought risk** is detected using a **drought severity index** based on a station's statistical inter-quartile rainfall ranges [MIN, Q1, Q2, Q3, Q4, MAX] and the observed rainfall for the period (10-day, monthly, seasonally or annually). The following categories of drought severity are used:

1. **Driest on record conditions**, if the observed rainfall is less than the minimum on record (MIN) and

- Drier than normal conditions**, if the observed rainfall lies between the minimum on record and the 1<sup>st</sup> quartile, Q1.

The time series charts of the actual rainfall compared with the long term mean - LTM (Figure 6) and/or standardized rainfall anomalies are also used to monitor and compare drought severity in each season. The charts clearly indicate the poor rainfall performance during the 2000, 2004, 2005 and 2010/11 droughts.



**Figure 6:** MAM and OND Seasonal rainfall charts for selected meteorological stations in Kenya, 1997 to 2013 by KMS.

**Seasonal Climate Outlooks** (for March-May-MAM, June-August-JJA and September-December-SOND) are prepared and issued to member states just before the start of the rainy seasons. The climate outlooks are developed by national and international climate scientists that meet at “Regional Climate Outlook Forums”-RCOFs. ICPAC is mandated to organize and coordinate the Greater Horn of Africa Climate Outlook Forums, (GHACOFs). The forum issues a **consensus seasonal rainfall forecast**, indicating areas likely to experience drier than normal, normal or wetter than normal conditions during the oncoming season over the region.

The information provided enable sectors like the Agriculture and Livestock put into action appropriate interventions depending on whether the situation indicate a normal, alert, alarm, emergency or recovery situation

### 3. Vulnerability Assessment:

The most affected sectors of the economy in order of importance are livestock (particularly among pastoralists), agriculture (crop farming), water and social sectors as indicated by the joint GoK-interagency post disaster needs assessment (PDNA) report of 2011 which indicated that, livestock worth KShs. 56.1 billion died because of the droughts, in addition to approximately KShs. 643.2 billion lost as a result of emerging constraints along the production and food supply value chains (e.g. water, feed and veterinary services; decline in production of meat, milk and other by-products). The report further indicated that in agriculture (crop farming), production of food and industrial crops reduced by an amount of Kshs. 121.1 billion in the same period.

A study financed by EU for the establishment of a National Drought Contingency Fund (NDCF) also noted that **accurate data on the economic costs of drought does not exist** in Kenya. It was estimated that the Government spent seven billion shillings on relief food distribution during the 2006 - 7 drought. They also estimated that the financial cost of the 1999 -2001drought was USD 340Million (22.5 billion Shillings) which included emergency relief, livestock losses, and cost of operating the Early warning System (EWS). The net effect of drought has been to draw development resources from planned programmes to emergency food aid assistance and therefore led to slowdown in economic activity for the whole country.

The communities have experienced more frequent crop failure, reduced yields and low calorie intake resulting in declining level of nutrition among the people. Drought impact is compounded by widespread poverty and disruption of traditional coping mechanisms. After a severe drought, heavy rains tend to follow with intensity leading to flooding, spread of malaria and other water borne diseases

Lack of food at household level is occasioned by low milk production and depressed purchasing capacity of pastoralists (as food prices increase) increasing their vulnerability to starvation. Deteriorating livestock health, low crop yields, and rising food prices exacerbate food insecurity. Further, increased competition for scarce grazing and water resources often leads to inter-communal conflicts, insecurity, limited access to markets and other basic services compounding an already serious situation.

Drought imposes social costs by undermining the social standing of pastoral households whose position of honor is gauged through the size of their livestock herds. Drought

disrupts local power relationships and damages the social safety networks that are built around lending and borrowing of livestock thus promoting equitable ownership of the only means of livelihood. Drought also increases household vulnerability in event of future climatic shocks and food insecurity. It pushes pastoralists out of their production systems, forcing them to move to urban centers where food distribution, health, sanitation and water supply may be more reliably available.

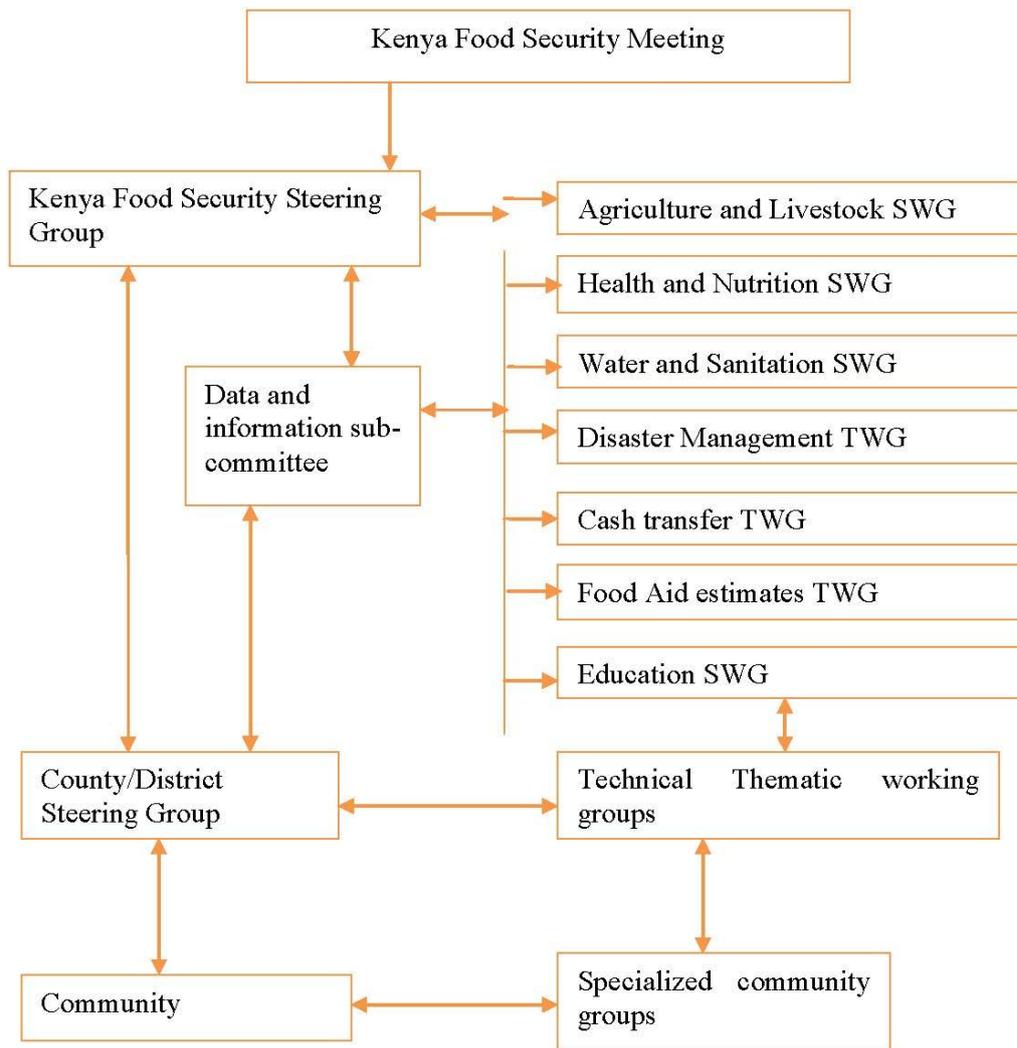
#### **4. Emergency Relief and Drought Response:**

Some concrete responses to drought management in Kenya have been put in place. Documents and processes include: Ending Drought Emergencies (EDE); a 10 year programme presented to the Horn of Africa Summit in September 2011; “Nairobi strategy on Enhanced Partnership to Eradicate Emergencies approved by the Heads of State in September 2011; Subsequent regional programme development by IGAD; Follow-up Ministerial-level meeting in March 2012; In the Kenya Vision 2030, drought and climate change are widely addressed under risk management,.

The main types of emergency interventions provided include;

Food relief for affected people with special food formulas for most affected (children, elderly and mothers), human disease control and treatment, animal feed and supplements, water for human and livestock, cash transfer, food/cash for work/assets, livestock disease control (vaccinations against common diseases and mass treatment), shelter, debt relief, destocking, restocking, distribution of seed, supplementary feeding for livestock especially the breeding stock, rehabilitation of water points and agricultural credit

During drought emergencies, rapid response teams are activated that implement pre-planned interventions. Decisions on actions to be taken are recommended by the Kenya Food Security Meeting and the Kenya food security steering group based on information gathered regularly by multidisciplinary teams and guided by internationally set of common principles and universal minimum standards for the delivery of quality humanitarian response.



**Figure 7 Kenya Food Security Institutional Structure (KFSM)**

**a. Policy Response to Drought Management**

Policy response to drought management in Kenya starts with the domestication of the global United Nations Convention to Combat Desertification (UNCCD) after ratifying it in 1997. It requires that Parties prepare and implement the National Action Programmes (NAPs) to address matters of desertification, land degradation and drought. Kenya prepared and adopted its first NAP in the year 2002 and has been implementing it since then. During the Conference of Parties (Decision 3/COP.8) parties were asked to review and align their NAPs to the UNCCD Ten Years Strategy (2008-2018). Kenya is at an advanced stage of aligning its NAP to this Strategy after receiving both technical and financial assistance from UNEP. It is expected that implementation of this policy document will go a long way in addressing impacts and mitigation of droughts in the country.

Policy paper (Sessional paper No. 8 of 2012) was also developed with an overall goal to guide Sustainable Development of Northern Kenya and Other Arid Lands by increasing investment in the region and by ensuring that the use of the resources is fully reconciled with the realities of peoples’ lives. The policy provisions are consistent with the African Union Policy Framework for Pastoralism in Africa which was approved in January of 2011. It’s through this policy that the National Drought Management Authority was formed to coordinate all matters related to drought management in the country.

## 5. Practices to Alleviate Drought Impacts:

In Kenya, there is an elaborate drought coping mechanism in place to respond to drought situations. Noting that drought comes in cycles, different activities are carried out at different times of the drought cycle. Table 1 below shows some of the key interventions and practices applied by government and other supporting institutions, including NGOs and private sector at different times of the drought cycle to help affected communities to cope.

Area of Intervention	Normal	Alert	Emergency	Recovery
Water	Promotion of water harvesting and storage, training water user associations, planning for new water sources, deepening wells, disilting pans, planning future interventions	Strategic needs assessment, protection of strategic wells, repairing poorly working boreholes	Implementing contingency plans including water supply (tankering), keeping strategic watering points functional, monitoring water availability	Improve water pans and develop new ones through food for work or cash for work
Food security and nutrition	Promote animal production & drought resistant crops, improve extension services, develop strategic cereal banks, capacity building	Stock strategic reserves, data sources used to warn and alert donors & government, provide food to most affected	Food relief, activate rapid response teams, diversify income, improved activity for health and nutrition	Replacing assets, providing tools and seeds, strengthen community management structures, cash-for-work, food-for-work
Livestock production	With enough pasture & water, building up the herd, capacity building, strengthen social networks, develop livestock markets, conserve & protect pasture using traditional rules & range management approaches	Selecting animals for sale, herd separation & splitting, drying and smoking meat for later use, supplementary feeding, feed storage, alert donors and negotiate grants, control breeding,	Increased sale of animals or barter, migration in search of pasture, stop breeding, provide emergency water & feed esp. for lactating & breeding animals, work-for food/assets,	Review damage & document lessons, restocking traditionally, buying or through assistance, build pasture & water resources, strengthen animal health services, capacity building, vaccinate, deworm, alternative livelihoods
Animal Health	Establish common approach to disease control, vaccinate, deworm, maintain cattle dips	Mass vaccination, deworming, equip drug stores, carry out cross border disease monitoring	Emergency disease control, target drought prone animals (calves, lactating, sick) for special treatment	Document and evaluate lessons learnt, re-stock drug stores, vaccinate and deworm, use feed supplements until animals regain their health, capacity building
Crops	Identify drought resistant, early maturing crops & indigenous plants that require little water. Capacity building, promote agro-forestry for fruits, fuel, fodder	Promote small scale irrigation, prepare kitchen gardens by drip irrigation, extension services,	Irrigation where possible, food relief,	Prepare land for planting, provide tools, seed and other inputs, improve soil fertility, repair irrigation facilities, planting of short term crops soon as it rains,

	& medicine. Pest and disease control			capacity building.
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**Table 1; Key Interventions at Different Stages of the Drought Cycle**

Other alternative sources of livelihoods in ASALs consistent with drought mitigation include use of multipurpose trees, like *Moringa* (*Moringa oleifera*) and herbs such as *Aloe vera* farming. Tapping into gum tree to create wealth in northern Kenya is also important harvesting gum from drought resistant Commifora and Acacia species like *C holtziana*, *C pseudopaolii*, *A. Senegal* and *A. seyal*

Bee farming (apiculture) is also a rewarding and enjoyable occupation with many benefits. It is a source of many non-perishable foods; honey, bee wax, pollen, propolis, bee venom, royal jelly, bee colonies, bee brood, queen bee and package bees. Bee keeping encourages environmental conservation. Bees are good pollinators of plants, trees and crops thus play a role in biodiversity and improvement of crop yields. Therapeutic values of most hive products provide remedy for a number of ailments (apitherapy).

#### **6. The Need for Knowledge and Skills on Drought Management:**

Despite improvements to early warning and contingency planning systems, drought management in Kenya has continued to take a reactive, crisis management approach rather than an anticipatory and preventive risk management approach. Until recently, drought management systems had been operated through a succession of time-bound projects since its origins in the mid-1980s.

Some of the gaps/shortcomings in drought management include;

- The gap between information provided by the early warning systems about impending threats and the ability of government to act to reduce those threats. *There is an urgent need for attitude change towards early warning information.*
- District drought management plans have included pre-prepared ‘shelf projects’ of activities to be triggered by the early warning systems, but without proper funding these projects are not carried out.
- Improve access to meteorological information at the local level to help farmers cope with increasing unpredictable weather conditions.
- NDMA relies on sector departments for some technical data, therefore ensuring the accuracy of data and its understanding in the sector departments is critical for its effectiveness.
- The EWS is supposed to trigger support for the communities upon a given threshold. The support is to come from National Drought and Disaster contingency fund that is yet to be operationalized.
- There is a focus on initiatives that build resilience in pastoral and agro-pastoral areas that are multi sectoral in nature, but the danger is over emphasizing alternative livelihood approaches at the expense of neglecting the main livelihoods due to pressure of showing immediate tangible results.
- Increase the availability of improved technologies to harness scarce and renewable resources like water, solar energy and wind.

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