

Joint project with:



**United Nations**  
Convention to Combat  
Desertification

Briefing Paper 23/2017

## Drought Adaptation and Resilience in Developing Countries

### Summary

Drought is one of the most damaging natural hazards. Various studies rank it first among all natural hazards by seriousness of impacts such as the loss of life and livelihoods, economic losses and the adverse social and ecosystem effects.

In many instances, drought can be a major factor in local conflicts, as well as internal and international migration – these negative effects of drought often persist long after the precipitation returns to normal levels.

The causes of droughts are essentially natural, but climate change increases the drought severity, frequency, duration, and spatial extent. The impacts of droughts are also strongly exacerbated by anthropological activities, such as deforestation, overgrazing, soil degradation, and water mismanagement. In turn, the consequences of these activities are also exacerbated by drought, which creates a vicious cycle of ecological degradation and human misery.

A reactive approach to droughts is still prevalent in many countries, even though emergency funding is costly, less effective and does not address the long-term causes of vulnerability and lack of sustainability. There is an urgent need to move forward with a paradigm shift from “crisis” to “risk” management, adopting a proactive approach based on the principles of risk reduction and prevention.

There is a whole set of effective measures that need to be implemented to increase resilience to drought and minimise its effects. Monitoring and early warning systems along with assessments of the hot spots of vulnerable populations and regions, as well as investments in risk-mitigating measures are the first line of defence. These actions need to become an integral part of national drought policies. Moreover, the full cyclical phenomenon of droughts should be at the core of the

drought management plans to take full advantage of the drought preparedness measures. All “drought-relevant” sectors including agriculture, food security, the environment, meteorology, water, energy and tourism have to be included in the drought policy development process and preparedness plans.

Integrated proactive drought policies should encapsulate the following aspects:

- A strong and comprehensive institution is essential to enhance information-sharing, coordination, cooperation and knowledge-management among various levels of governments, sectors and society.
- Drought risk management must be incorporated into both long-term development measures and humanitarian responses.
- A combination of top-down (overall drought policy, institutional set-up, funding, modern knowledge) approaches supported by bottom-up (traditional knowledge, local production, livelihoods and decision systems) measures is needed to guarantee the maximum efficiency of implemented measures.
- Drought early warning needs to be followed by early action based on reliability, transparency and trust.
- Flexibility of funding (contingency planning) must become an integral part of development budget planning.
- Drought policy implementation requires capacity-building at the local level to ensure effective interaction between concerned parties.

By implementing these approaches, we can use drought as a “connector” that strengthens collaboration among many sectors, levels and actors.

### Why national drought policies?

Based on various characteristics such as severity, duration, spatial extent, loss of life, economic loss, social effect, and long-term impacts, several studies have found that drought is the most far-reaching among all natural disasters (WMO & GWP, 2014). In the context of poverty and food insecurity as well as political instability, drought and its associated impacts is responsible for more deaths and displacement of people than any other natural disaster. The adverse impacts of drought are particularly devastating for the poorest and most vulnerable groups in the drylands of developing countries, where economy relies on rain-fed agriculture and pastoralism. Developed countries are also affected, but in different ways: while drought-related famine is no longer an issue, there is increasing threat to energy security, water use for industry and services, forest fires and natural habitats.

The ways in which drought affects the poor and vulnerable rural households are multifaceted and complex: they include lack of water for people, livestock, pasture and crops, energy, decreased food availability and the rise in food prices, loss of lives, livelihoods, and assets. Droughts also fuel local conflicts around natural resources. And, while it is contested whether it leads to or amplifies larger conflicts and mass migration in the short run, there can be no doubt that the frequency and severity of droughts act as a conflict amplifier in the long run.

The reasons for the emergence of droughts are essentially natural – droughts have accompanied humankind from the very beginning, embodied in one of the apocalyptic riders. However, as humans have increasingly shaped their environment over the centuries, drought risks have become socially constructed, at least in part. Deforestation, forest fires, overgrazing, soil mining, degradations of land and vegetation, as well as water mismanagement lead to increased susceptibility to droughts, foster the drying of soils and water sources, over-exploitation of groundwater reservoirs and together reduce the resilience of landscapes and people.

Droughts often affect rural areas, far from the centre of political activity. The creeping and multi-faceted nature of these disasters, coupled with the lack of systematic recording of impacts, contributes to the reduced political and economic visibility of the drought-related issues, compromising the will to address underlying risks.

In the coming decades, drought is projected to increase in severity, frequency, duration and spatial extent, at the same time as the world's land areas are expected to become drier overall. This will have severe consequences for people in poor countries and particularly in rural areas with arid and semi-arid lands, which are particularly susceptible to droughts. Recent simulations show that the food security of developed countries may also be threatened by droughts if drought simultaneously affects several global production areas – such as the maize-growing industry in the United States and China – which is a distinct possibility under the climate-change scenario (Kent et al., 2017).

While the general process of economic development can help alleviate the negative effects of droughts in the long run, time is running short for developing countries. Economic development itself can be compromised by intense and frequent droughts, and the local development is at risk. In addition, the effectiveness and efficiency of ad hoc drought management approaches that are implemented when the disaster strikes, are low (Gerber & Mirzabaev, 2017; WMO & GWP, 2014) and long-term impacts are often disregarded.

Proactive approaches are crucial to increasing the resilience to drought for people, ecosystems and societies. In developing countries, food security should be at the core of national drought policies and a strong driving force for drought preparedness at all levels.

### Drought resilience, preparedness and cycle management

The implementation of national drought policies based on the principles of risk reduction can play the key role in mitigating drought impacts. Such principles and their implications for action are outlined in international voluntary agreements such as the Hyogo and the Sendai frameworks for disaster risk reduction and the seminal 2013 High-level Meeting on National Drought Policy. Based on these international frameworks, the following “three key pillars” of drought risk reduction can be specified:

1. Implement drought monitoring and early warning systems.
2. Assess drought vulnerability and risk.
3. Implement measures to limit impacts of drought and better respond to drought.

These key measures can help countries prepare better for, respond to and recover from drought by reducing exposure and vulnerability, increasing resilience as well as the transferring and sharing of drought risks. They need to be translated into national drought policies according to country-specific needs, conditions and vulnerabilities, priorities and options.

Drought is a complex, recurrent and slow-onset phenomenon. In contrast to other natural disasters, such as floods and earthquakes, it takes long to realise that drought – length, severity and extent – is in the making with implications for action to limit the impacts. As with all natural disasters, in case of droughts, it is essential to use the non-drought period to build up resilience, while the interventions during drought itself need to focus on early response, with due consideration of the certainty of the early warning systems and the monitoring of evolving drought conditions. Drought interventions should also be designed to include the preparedness measures for the next drought cycle which leads to the concept of drought cycle management (see Figure 1), where proactive and reactive measures are fully integrated.

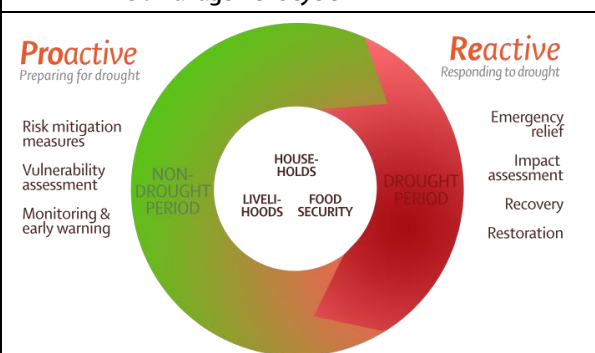
A comprehensive list of policy areas required to tackle food insecurity in drought-prone areas is shown in Table 1. It involves multiple sectors: water, land and other natural resources, agriculture and food trade, social security, economic development and infrastructure. Other domains, such as energy and health,

may also be heavily affected by droughts and require adequate preparedness plans and management.

Drought preparedness and management frameworks need to include a certain measure of flexibility. Droughts are slowly creeping phenomena whose accumulated impacts not only depend on precipitation but also on water storage, access and consumption, as well as on specific target systems. It is difficult to determine when exactly droughts start and end (WMO & GWP, 2014). Smallholders and disadvantaged consumers may be affected earlier than commercial farmers and the privileged. While waiting to see how drought conditions evolve, the focus should be on “no- or low-regret” measures, which can be adjusted according to the best available and updated information and risk scenarios. For instance, food stocks can be built up through local storage or international purchases, including by the private sector. This requires reliable data on future crop supply and demand. Water can be used for irrigation to overcome dry spells or short-term droughts, but may have to be reduced to the most essential uses during longer drought spells if water reservoirs become depleted. Vaccination and livestock reduction campaigns can be set in motion early on to avoid price collapses; and social safety programmes can be scaled up during drought periods, providing cash or food as dictated by the food market conditions.

Special treatment may be required for particularly vulnerable groups of drought-affected populations and ecosystems. For example, specific strategies are often necessary for pastoralists who very often live in particularly drought-vulnerable arid areas. In fact, pastoralism has often been the best tradition al adaptation strategy in these regions. In more recent times,

**Figure 1: Conceptual framework for the study: drought risk management cycle**



Source: Authors

the flexibility of livelihood options for pastoralists has been shrinking, in addition to increasing constraints of time and space available. New trends, such as population growth, education, or changes in income sources and consumption habits are calling for further structural changes. Improving the resilience of pastoralists against drought requires maintaining a particularly difficult balance between continuing the traditional way of life and the shift to alternative livelihoods.

It is necessary to consider that women and girls are often affected by drought in ways substantially different from men. During drought, school drop-out rates for girls increase because of early marriage or to help fetch water while adult women's workloads and exposure to gender-based violence may increase during drought and access to essential sanitary supplies for hygiene become a challenge (CARE, 2016).

**Table 1: Role of key policy domains/sectors for building up food-security enhancing drought resilience during drought and non-drought times**

Policy domain	Non-drought period	Drought period
Early warning systems/knowledge management	<ul style="list-style-type: none"> <li>Risk assessment</li> <li>Vulnerability assessment</li> <li>Drought planning</li> <li>Knowledge dissemination</li> </ul>	<ul style="list-style-type: none"> <li>Ongoing impact assessment</li> <li>Monitoring and evaluation of mitigation and emergency measures</li> </ul>
Water/landscape	<ul style="list-style-type: none"> <li>Landscape/watershed management, water harvesting and conservation on- and off-farm</li> <li>Water storage</li> <li>(Water-saving) irrigation</li> <li>Water contingency planning</li> </ul>	<ul style="list-style-type: none"> <li>Contingency execution (drinking and livestock first)</li> </ul>
Agriculture	<ul style="list-style-type: none"> <li>Drought resilience breeding</li> <li>Cropping system adjustment (new crops)</li> <li>Fostering livestock markets</li> <li>Seed (emergency) stocks</li> <li>Managing pastoralism and crop/livestock integration</li> </ul>	<ul style="list-style-type: none"> <li>Irrigation or stop according to drought severity and outlook</li> <li>Livestock vaccination and reduction</li> <li>Protecting key animals, recovery</li> <li>Seed distribution (recovery)</li> </ul>
Finance	<ul style="list-style-type: none"> <li>Crop and livestock (weather) insurance</li> <li>Savings</li> <li>Cash transfer facilities</li> </ul>	<ul style="list-style-type: none"> <li>Ease disbursements</li> <li>Use for emergency cash transfers (private and public)</li> </ul>
Social protection	<ul style="list-style-type: none"> <li>Establishing social security systems</li> </ul>	<ul style="list-style-type: none"> <li>Scaling up to drought-affected populations, cash or in kind</li> </ul>
Food markets	<ul style="list-style-type: none"> <li>Fostering food crop markets (integration, storage, commercial linkages)</li> <li>Establishing food price monitoring systems</li> </ul>	<ul style="list-style-type: none"> <li>Facilitating commercial food inflows</li> <li>Situation-sensitive regional food aid</li> </ul>
General economic development	<ul style="list-style-type: none"> <li>Income diversification</li> <li>Migration as income diversification measure</li> <li>Infrastructure (transport, storage, telecommunication, etc.)</li> <li>Contingency planning</li> </ul>	<ul style="list-style-type: none"> <li>Infrastructure-building as part of emergency aid and reconstruction (cash/food for work)</li> </ul>

Source: Authors' compilation, based on Duguma et al. (in press)

## Policy coherence and coordination

Policy coherence and coordination for drought resilience are particularly important and at the same time difficult to achieve because they involve multiple dimensions: sectors, various decision-making levels, time, socio-economic and technological transitions. Bottom-up solutions to drought resilience bring more advantages, because they are more compatible with aspirations and local knowledge, but often face challenges when introduced into drought-preparedness approaches. Economic diversification away from income sources reliant on rainfall is extremely difficult in some rural areas, particularly in the sparsely populated drought-sensitive arid and semi-arid areas. There are also trade-offs – for example, drought-resilience versus optimisation under normal conditions; investment into production versus resilience-enhancing infrastructure; self-reliance of food production during normal periods versus establishing food markets during droughts, or specialisation gains along with security measures such as insurance or savings versus resilience through diversification.

The implementation of multi-sectoral drought policies should focus on the following: (see Duguma, Brüntrup, & Tsegai, i.p.):

- The best-case scenario should include a general framework for disaster risk management, where specific actions against droughts, based on specific needs and characteristics, are identified. For weather-induced disasters such as floods, close coordination with drought policies can be beneficial. Whether a standalone or embedded into a larger disaster management strategy, a strong and comprehensive coordinating body is essential for drought management to enhance cooperation among the various levels of governments, development partners and non-governmental organisations.

- Drought risk management approaches must be integrated into both long-term development measures and humanitarian responses. This requires a clear understanding of short-term disaster relief activities by all stakeholders, as well as long-term development measures towards building resilience at community, sub-national and national levels and across multiple sectors. Regional and international issues should be explicitly considered. Drought-related national policies should be supported by the bottom-up resilience approaches that combine the expertise of farmers, civil society and grass root groups, as in the “Ending Drought Emergency” programme of Kenya.
- The effective communication among relevant stakeholders for the efficient and proper functioning of drought early warning systems is important. It should be combined with long-term drought resilience and preparedness planning, better targeting, and proactive action. Strong monitoring, evaluation and knowledge management of drought resilience efforts and achievements should also be included in the drought-preparedness framework.
- Flexibility of new and existing programmes and their funding through contingency planning needs to be built into the development budgets. The development programmes should be able to switch to “emergency mode” and fund the emergency action when drought is declared. For example, the Productive Safety Net Programme (PSNP) in Ethiopia is in many cases temporarily expanded during drought periods. Building the capacity of individuals, institutions and organisations, especially at the local level, is imperative to efficiently mobilise, process, use and absorb resources.

By taking into consideration all these aspects, we can utilise drought as a “connector”, strengthening collaboration between many sectors, levels and actors.

## References

- CARE. (2016). *Hope dries up? Women and girls coping with drought and climate change in Mozambique*. Maputo, Mozambique: CARE International in Mozambique. Retrieved from [http://careclimatechange.org/wp-content/uploads/2016/11/El\\_Nino\\_Mozambique\\_Report\\_final.pdf](http://careclimatechange.org/wp-content/uploads/2016/11/El_Nino_Mozambique_Report_final.pdf)
- Duguma, M. K., Brüntrup, M., & Tsegai, D. (in press). *Policy options for improving drought resilience and its implication for food security* (DIE Studies). Bonn: German Development Institute / Deutsches Institut für Entwicklungspolitik (DIE).
- Gerber, N., & Mirzabaev, A. (2017). *Benefits of action and costs of inaction: Drought mitigation and preparedness – a literature review*. Retrieved from [https://library.wmo.int/opac/doc\\_num.php?explnum\\_id=3401](https://library.wmo.int/opac/doc_num.php?explnum_id=3401)
- Kent, C., Pope, E., Thompson, V., Lewis, K., Scaife, A. A., & Dunstone, N. (2017). Using climate model simulations to assess the current climate risk to maize production. *Environmental Research Letters*, 12(5), 054012.
- World Meteorological Organization (WMO) & Global Water Partnership (GWP). (2014). *National drought management policy guidelines: A template for action*. Retrieved from [https://library.wmo.int/pmb\\_ged/wmo\\_1164\\_en.pdf](https://library.wmo.int/pmb_ged/wmo_1164_en.pdf)

*This work is part of the research project “Promoting food security in rural sub-Saharan Africa” of the German Development Institute / Deutsches Institut für Entwicklungspolitik (DIE) funded by the German Ministry for Economic Cooperation and Development (BMZ) under its “One World – No Hunger” (SEWOH) initiative.*

### Dr Michael Brüntrup

#### Senior Researcher

Department II: “Sustainable Economic and Social Development”

German Development Institute / Deutsches Institut für Entwicklungspolitik (DIE)

### Dr Daniel Tsegai

#### Programme Officer

External Relations, Policy and Advocacy Unit (ERPA)

United Nations Convention to Combat Desertification (UNCCD)