

*Drought Resilience, Adaptation and
Management Policy (DRAMP)
Framework*

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1 A New Approach to Drought

Drought is a natural phenomenon which often impacts people, the economy and ecosystems. Prolonged droughts reduce food production and water availability and at their worst lead to significant human suffering and loss of life. Droughts have a negative impact on ecosystem functions, reduce social, political and economic stability and can increase vulnerability to other natural disasters, such as heat waves and floods. Climate change is expected to increase the frequency and severity of droughts in large parts of Africa and in the Americas, as well as in southern, central and eastern Europe, the Middle East, Australia, and Southeast Asia [2]. The population of the most vulnerable regions, particularly the poorer areas where land and water resources are already limited, need to be better prepared for future droughts by reducing risks and increasing drought resilience.

Recent international and regional initiatives have changed the way drought is assessed and managed. Historically, drought was viewed as a natural disaster to which society responds with a reactive crisis management approach that deals only with the symptoms of drought. This approach has proven to be highly inefficient, because it creates a culture of dependency and offers few incentives for changing the ways in which land and water resources are managed to reduce future drought impacts [3].

Nowadays drought is more often viewed as a natural event that requires society to take a pro-active preparedness approach to reduce societal vulnerability and increase resilience to drought [4]. As with any natural disaster, addressing drought should not be focused solely on managing the crisis, but needs to encompass the full cycle of disaster management.

A pro-active approach to increasing drought resilience is centred on better management of land and water resources. Halting land degradation along with protecting and restoring natural capital and ecosystem services through land rehabilitation, ecological restoration and the allocation of water to environmental flows will strengthen ecological, economic and social systems against more severe impacts of drought and increase their ability to recover from disaster. Nature-based solutions to drought management provide many other ecological benefits, including reducing risks from other natural disasters as well as mitigating and adapting to climate change.

Pro-active ways to reduce drought risks also include improved drought monitoring, forecasting and early warning systems, along with assessments on drought vulnerability and impact for communities at risk.

2013: A turning point for drought management planning

The shift from a re-active to proactive approach to drought was the key theme of the High-level Meeting on National Drought Policy (HMNDP) held in Geneva in March 2013. The outputs of the HMNDP [5] include the Final Declaration, the Policy Document advising national drought management policy, and the Science Document outlining best practices in developing national drought management policies. These documents outline five major outcomes of the HMNDP:

1. Nations must recognise the urgency and severity of the drought problem;
2. Scientific progress must be achieved in developing drought monitoring and early warning systems;
3. Coordinated and consistent drought vulnerability and impact assessments are urgently needed;
4. Drought relief and emergency response and recovery measures must be well-targeted to ensure better preparation, mitigation and adaptation to future droughts;
5. There is an urgent need for effective drought management policies that mitigate drought impacts by combating land degradation and desertification, as well as by implementing IWRM principles and rolling out science-based climate prediction and services.

During the HMNDP, the Global Water Partnership (GWP) and World Meteorological Organisation (WMO) launched the Integrated Drought Management Programme (IDMP). The IDMP supports regions and nations in developing more proactive national drought policies and better drought prediction tools, including the publication of the National Drought Management Policy Guidelines in 2014 [1]. The National Drought Management Policy Guidelines presents a ten-step process (presented in Box 1) for developing and implementing national drought management policies. A UN-Water collaborative initiative to support countries in developing National Drought Management Policies (NDMP) was also launched at the HMNDP and spearheaded by WMO, the United Nations Convention to Combat Desertification (UNCCD), the Food and Agriculture Organization of the United Nations (FAO), the Convention on Biological Diversity (CBD) and the UN-Water Decade Programme on Capacity Development (UNW-DPC).

Throughout 2013-2015, a series of regional capacity building workshops on developing drought management policies were held in Eastern Europe, Latin America and the Caribbean, Asia-Pacific and Africa (East and South, Near East and North, West and Central). The workshops presented the ten-step process (Box 1) to assist drought-prone countries in developing drought management policies and preparedness plans. The regional workshops also outlined the “three key pillars” of drought risk reduction, namely:

- Implement drought monitoring and early warning systems;
- Complete vulnerability assessments for sectors, populations and regions vulnerable to drought, and;
- Implement drought mitigation measures that minimise adverse impacts of drought and provide appropriate response measures when drought occurs.



Box 1: The Integrated Drought Management Programme ten-step process for developing and implementing drought management plans.

Step 1: Appoint a national drought management policy commission.

Step 2: State or define the goals and objectives of a risk-based national drought management policy.

Step 3: Seek stakeholder participation; define and resolve conflicts between key water use sectors, also considering transboundary implications.

Step 4: Inventory data and financial resources available and identify groups at risk.

Step 5: Prepare/write key principles of the national drought management policy and preparedness plans, which should include the following elements: monitoring, early warning and prediction, risk and impact assessment, mitigation and response.

Step 6: Identify research needs and fill institutional gaps.

Step 7: Integrate science and policy aspects of drought management.

Step 8: Publicize national drought management policy and preparedness plans, build public awareness and consensus.

Step 9: Develop educational programmes to include all age/stakeholder groups.

Step 10: Evaluate and revise national drought management policy and support preparedness plans.

See World Meteorological Organization (WMO) and Global Water Partnership (GWP) [1]

The “three key pillars” are encapsulated in Step Five of the process and involve writing national drought management policy and preparedness plans (see Box 1).



2015: Reducing drought risk is everyone's responsibility

In parallel with the HMNDP and subsequent regional capacity-building workshops was the development and adoption (in March 2015) of the United Nations *Sendai Framework for Disaster Risk Reduction 2015-2030*. The Sendai Framework succeeds the *Hyogo Framework for Action (HFA) 2005-2015: Building the Resilience of Nations and Communities to Disasters*, which builds on previous UN initiatives dating back to the early 1990s [4, 6] to encourage better preparation for natural disasters. A key approach of the Sendai Framework, and consistent with the HMNDP, is that nations take a proactive approach to managing disasters.

The Sendai Framework lays out thirteen principles and four priorities for nations to reduce risks from natural disasters. The four priorities for action are:

- i) Understanding disaster risk;
- ii) Strengthening disaster risk governance to manage disaster risk;
- iii) Building resilience by investing in disaster risk reduction, and;
- iv) Enhancing disaster preparedness for effective response and to “build back better” during recovery, rehabilitation and reconstruction.

The thirteen principles of the Sendai Framework are:

1. Each state needs to assume the primary responsibility for preventing and reducing disaster risk, if needed through sustainable international cooperation;
2. Responsibilities of disaster risk reduction are the shared duty of central governments and relevant stakeholders;
3. Management of disaster risk serves to protect people, their assets, as well as cultural and environmental wealth;
4. Disaster risk reduction requires the engagement and partnerships of all of society;
5. Disaster risk reduction and management depend on coordination mechanisms within and across sectors and with relevant stakeholders at all levels;
6. Local authorities and local communities need to be empowered to take an active role in reducing disaster risk;
7. Disaster risk reduction requires a multi-hazard approach and inclusive risk-informed decision-making;
8. Disaster risk reduction, which is essential to ensuring sustainable development, requires coherence across sustainable development and growth areas – food security, health and safety, climate change and variability, as well as environmental management;
9. Local and specific characteristics of disaster risk must be understood to reduce it;
10. Addressing underlying disaster risk factors by informing the public and mobilizing private investments is more cost-effective than reliance primarily on post-disaster response and recovery;
11. Post-disaster recovery, rehabilitation and reconstruction need to reduce future disaster risk by “building back better” and increasing public awareness of disaster risks.
12. Global partnerships and strengthened international cooperation, especially through development assistance, are essential for disaster risk management;
13. Developing, middle-income and other countries that face challenges in addressing disaster risk need adequate, sustainable, timely and customized support that matches their needs.

The priorities and principles of the Sendai Framework provide a strong foundation for drought resilience, adaptation and management policies that can reduce risks associated with drought at national and sub-national scales.

2016: A focus on Africa

The first African Drought Conference, held in Windhoek, Namibia in August 2016, brought together African Member States and Parties to the UNCCD, as well as ministers, heads of Delegation and experts to discuss ways to enhance drought resilience in Africa. The two major outcomes of the conference are the Windhoek Declaration [7] and the White Paper on Drought Resilient and Prepared Africa (DRAPA) [8]. Signatories to the Windhoek Declaration committed to the implementation of a strategic framework for DRAPA at national level, guided by six principles:

1. Drought policy and governance for drought risk management;
2. Drought monitoring and early warning;
3. Drought vulnerability and impact assessment;
4. Drought mitigation, preparedness and response;
5. Knowledge management and drought awareness; and
6. Reducing underlying factors of drought risk.

The Windhoek Declaration reaffirms the countries' commitment to seek synergies in implementing the Rio Conventions and various international multi-lateral proclamations, decisions and resolutions including the UNCCD commitment to achieve Land Degradation Neutrality by 2030, the 2013 Final Declaration of the HMNDP, the 2015 Sendai Framework, the 2015 Paris Agreement on Climate Change, the 2015 UN Sustainable Development Goals, the Agenda 2063 The Africa We Want, and the 2016 UN Environment Assembly resolution to combat desertification, land degradation and drought and promote sustainable pastoralism and rangelands.

While there is a strong focus on drought as the primary area of concern for Africa, there have also been substantial efforts to reduce risk of natural disasters in general. Since the early 2000s, the emphasis has been placed on pre-emptive actions that reduce disaster risk: the 2004 Africa Regional Strategy for Disaster Risk Reduction, its 2006-2015 Extended Programme of Action, as well as the outcomes of the 6th Africa Regional Platform on Disaster Risk Reduction and the Fifth High-Level Meeting on Disaster Risk Reduction held in late 2016.

The need for a policy framework

Emerging from the many initiatives over the last twenty years, but especially since 2013, is a strong advocacy for developing national drought management policies, which establish a clear set of principles and operating guidelines to govern the management of drought and mitigate its impacts. A national drought management policy should take a risk-management approach that applies measures to prepare for, adapt to and mitigate drought impacts. Drought management policy should also support the development of comprehensive drought monitoring and early warning systems and outline ways for better communication and dissemination of information on drought onset and risks. But above all, a drought management policy should empower action and change that reduce risk and increase resilience.

However, no single policy, action or sector can achieve this by themselves, because drought is a complex phenomenon that is temporally and spatially diffused, requiring multiple indicators to measure its impact and an array of actions to reduce its risk [9]. Reducing drought risk requires a multi-pronged approach and supporting policy framework that embraces the principles and goals of drought resilience and management. The policy framework should coherently organize into logical groupings the wide variety of potential approaches and actions for reducing drought risk and increasing resilience. A coherent and integrated drought resilience and management policy framework would avoid fragmented and uncoordinated investments in land, water and socio-economic systems. The policy framework should recognise that drought impacts and



risks can have interconnected effects on multiple sectors, including land, water, energy, environment and agriculture.



2 The Drought Resilience, Adaptation and Management Policy (DRAMP) Framework

The Drought Resilience, Adaptation and Management Policy (DRAMP) Framework takes an integrated, multi-pronged approach to reducing risks and impacts of drought. Organized around six cross-cutting goals (Figure 1), the DRAMP Framework identifies pragmatic actions for countries to better prepare and respond to drought, and guides the design and implementation of drought policy at national to sub-national level.

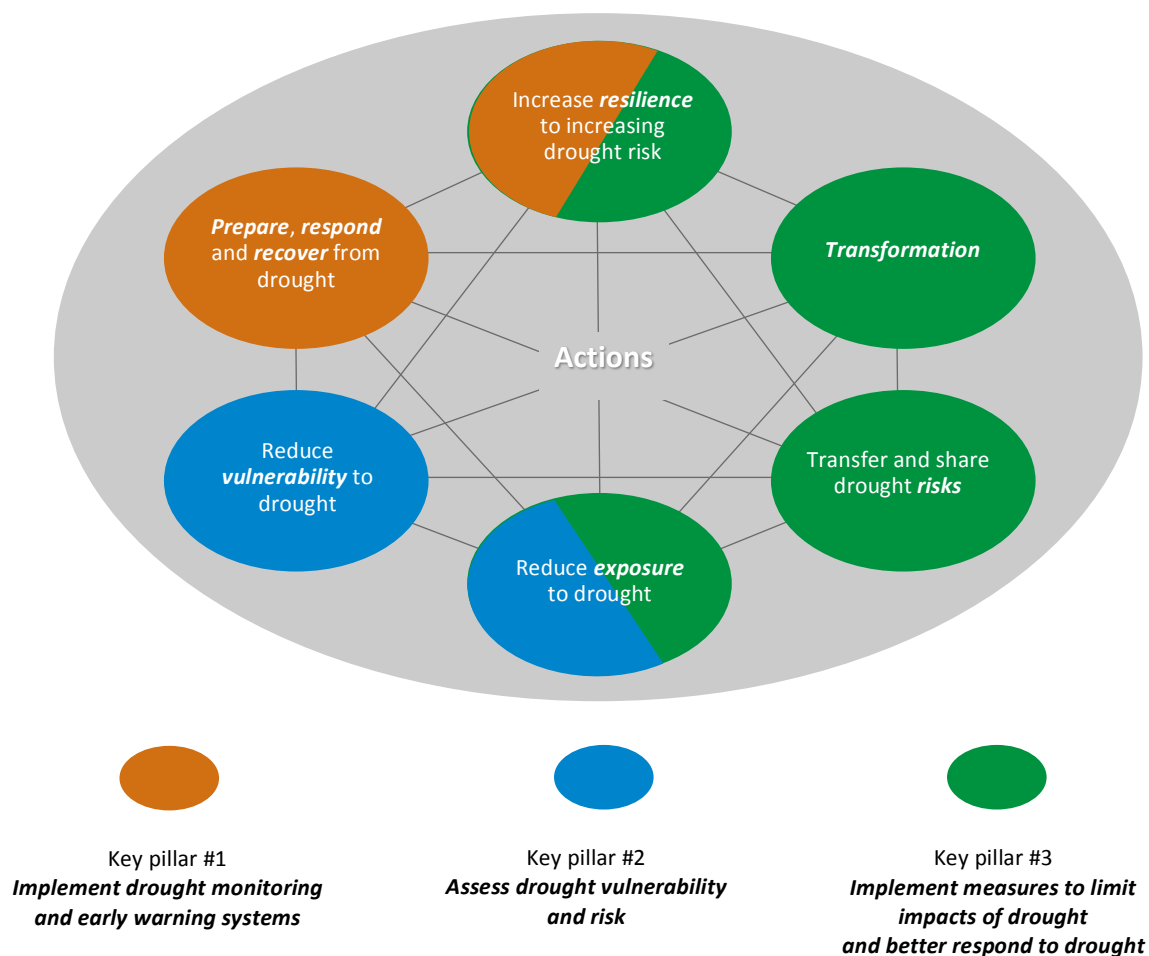


Figure 1: The Drought Resilience, Adaptation and Management Policy (DRAMP) Framework. The goals of the DRAMP framework are mapped onto the “three key pillars” of drought risk reduction to demonstrate the links between the framework and the pillars. Adapted from IPCC [10].

The six goals of the DRAMP Framework are not mutually exclusive, with many of the actions for managing and adapting to drought applicable for more than one goal. The six goals of the DRAMP Framework are:

1. **Reduce exposure to drought:** reduce the potential for loss of people, livelihoods, ecosystem services and resources, infrastructure, as well as economic, social or cultural assets in places that could be adversely affected by drought;
2. **Reduce vulnerability to drought:** reduce tendency to be adversely affected by drought;

3. **Increase resilience to drought risk:** strengthen the ability of communities, ecosystems and economies to anticipate, absorb, accommodate or recover from the effects of drought quickly and efficiently by ensuring the preservation, restoration or improvement of natural capital;
4. **Transformation:** alter fundamental attributes of social, economic and ecological systems, including value systems; regulatory, legislative, or bureaucratic regimes; financial institutions; and technological or biological systems;
5. **Prepare, respond and recover from drought:** the backbone of management and planning approaches to reduce drought risk, including development of comprehensive drought monitoring and early warning systems.
6. **Transfer and share drought risks:** distribute risks among wider section of society to include those who benefit directly and indirectly from robust drought risk management.

3 Key Principles of the DRAMP Framework

The implementation of the DRAMP Framework goals should be guided by a set of key principles to ensure consistency and clarity in the development of drought management policy and plans. The key principles presented below are based on the Sendai Framework, the outcomes of the HMNDP and subsequent regional capacity building workshops, as well as the DRAPA strategic framework and other relevant sources (New Zealand Ministry for Primary Industries,¹ Agriculture Victoria²). The key principles that guide DRAMP implementation are:

1. Every country has the primary responsibility to prepare for and mitigate drought impacts and reduce drought risks. This responsibility requires partnerships, coordination and collaboration between all levels of government, individuals, local communities, private sector and other relevant stakeholders;
2. The aim of drought risk management is to protect human, social, cultural, environmental and economic assets;
3. Addressing underlying drought risk factors is more cost-effective than post-drought crisis management;
4. Education, dissemination of information, communication and building awareness of drought risks are essential to risk reduction;
5. Local communities and authorities, as well as social and cultural minorities along with traditionally marginalized groups (women, poor, disabled, young and old) must all be involved in the process of drought risk reduction;
6. Working with nature (land, water, biodiversity and ecosystems) is a key tool for reducing drought risk;
7. Reducing drought risk is critical for sustainable development, achieving land degradation neutrality, climate change adaptation and mitigation, food and water security, human health and biodiversity conservation;
8. The priority in drought recovery and support should be given to communities that have undertaken reasonable efforts to reduce risks, with assistance aimed at restoring the community capacity for self-help and recovery with optimal speed;
9. Drought recovery and rehabilitation should be targeted to mechanisms which reduce risks of future drought;
10. Vulnerable countries should develop and implement drought adaptation and management plans that employ evidence-based approaches to:
 - a. Improve governance of drought risk management;
 - b. Build more comprehensive drought monitoring and early warning systems;
 - c. Undertake coordinated and consistent drought vulnerability and impact assessments;
 - d. Mitigate, prepare and respond to drought;
 - e. Raise awareness and share knowledge of drought, and;
 - f. Reduce underlying factors of drought risk.

¹ <https://www.mpi.govt.nz/document-vault/14623>

² <http://agriculture.vic.gov.au/agriculture/farm-management/drought-preparedness/victorias-drought-preparedness-and-response-framework>



4 Actions of the DRAMP Framework

Many actions are available to achieve the six goals of the DRAMP Framework. The goals are not mutually exclusive, thus actions presented for each goal could also be applicable for others. Taking into account the heterogeneous expression and impacts of drought, not all actions are applicable for every country. To keep this document brief, concise descriptions of actions available for achieving the DRAMP Framework goals have been included. References to literature for further reading and examples of many of the actions are also provided. A companion document outlines technical guidelines for practical, on-the-ground implementation of the DRAMP Framework at national scale.

4.1 Reduce Exposure to Drought

Reduce the potential for loss of lives, livelihoods, ecosystem services and resources, infrastructure, economic, social or cultural assets in places that could be adversely affected by drought.

Available actions include:

- Sustainable land use and management to improve soil conditions (for example, soil organic carbon), increase biodiversity and vegetated land cover, as well as reduce or halt land degradation [11];
- Diversify land and agricultural systems to reduce reliance on single crop and single land-use types [12], increasing the use of drought-resistant crop varieties;
- Take a multi-hazard approach to drought by aligning drought policy with other disaster risk management policies [13, 14];
- Promote increased labour productivity and mobility to reduce population pressures in risk areas;
- Implement principles of Integrated Water Resource Management to reduce pressure on water resources and increase availability of water to reduce the number of people exposed to drought impacts;
- Build capacity in local communities and implement bottom-up approaches to diversify local economic activities and sectors.

4.2 Reduce Vulnerability to Drought

Reduce the tendency to be adversely affected by drought.

Available actions include:

- Deepen understanding of community drought risk and vulnerability by developing risk profiles which consider vulnerable groups, including women, children, the elderly, the landless, farmers, pastoralists, marginalized communities and indigenous groups;
- Disseminate knowledge and deepen community understanding of existing drought adaptation practices [15];
- Utilize sustainable technology transfer, information exchange, network development, management skills, professional linkages and other resources [8];
- Reduce inequalities related to wealth and education, disability and health status, as well as gender, age, class and other social and cultural characteristics in population vulnerable to drought [8];
- Reduce inequalities in access to natural resources, especially agricultural water;
- Encourage innovations in water use efficiency, management and valuation, cropping and grazing systems, land use and land cover in drought-prone areas [16-18];
- Increase water supply options through investment in sustainable approaches to water harvesting, locating new potential resources, building new storages and groundwater recharge;



- Increase and diversify livelihood options in drought-prone areas [19, 20];
- Recognize and mitigate the impacts of drought on mental health and overall well-being [21];
- Implement land use planning at landscape scale to encourage sustainable land use in drought-prone areas;
- Ensure the conservation and sustainable use of biodiversity resources in farming systems;
- Encourage the cultivation of drought-resistant species and varieties in drought-prone areas to improve crop yields during drought.

4.3 Increase Resilience to Drought Risk

Strengthen the ability of communities, ecosystems and economies to anticipate, absorb, accommodate or recover from the effects of drought quickly and efficiently by ensuring the preservation, restoration or improvement of natural capital.

Available actions include:

- Take advantage of the natural systems' ability to reduce drought risk through increased provision of ecosystem services as well as ecological restoration and biodiversity conservation [8], reduced land degradation and desertification, along with the wise stewardship of all natural resources [22];
- Conserve and sustainably manage water resources;
- Use mix of hard infrastructure and soft solutions, such as capacity building, green infrastructure and nature-based solutions, to absorb and recover from the effects of drought [23];
- In agricultural production systems, diversify herd composition and movement along with crop types, change sowing times, manage pasture and rangeland carrying capacities, restore soil fertility and integrity, increase availability and access to water [19, 24];
- Identify and demonstrate clear links between drought risk reduction interventions in agricultural systems and livelihood improvements [25];
- In social systems, reduce dependencies on single resources and economic sectors, resolve conflicts over land and water resources;
- Take team approach to the dissemination of information [25] by creating dialogues, educating and informing citizens of drought risk [8]. Facilitate knowledge exchange and drought experiences among communities;
- Recognize spatial heterogeneity of local biophysical and socio-economic drought characteristics, levels of technology adoption and adaptation responses [13, 26-28];
- Support community-led, bottom-up initiatives that create sense of ownership in drought resilience and risk reduction strategies [8, 25];
- Incorporate drought risk assessment and planning into land use and rural development planning, health care systems, environmental and natural resource management approaches, supply chains and business models, as well as non-agricultural sectors [13];
- Take an integrated approach to technological, policy and institutional options that increase drought resilience [20];
- Increase human adaptive capacity [29, 30], especially social capital [31].

4.4 Transformation

Top-down or bottom-up approaches to altering the fundamental attributes of social, economic and ecological systems (including value systems; regulatory, legislative, or bureaucratic regimes; financial institutions and technological or biological systems).

Available actions include:

- Move away from short-term reactionary, crisis, post-impact drought policy and a culture of dependency on government and donor drought hardship payments [3, 8, 22];
- Reward preventative measures and remove perverse incentives;
- Create a preventive, long-term risk management culture supported by drought prevention, mitigation and adaptation strategies [22, 32, 33];
- Empower government institutions to assume coordinated and strategic leadership [33, 34] and implement drought risk management policies [8];
- Anticipate and communicate drought risk, in particular by educating rural communities [13];
- Support drought-induced labor migration and increased productivity in agriculture [35, 36];
- Recognize the broad range of water, land and ecosystem values [37];
- Take an integrated, trans-boundary and participatory approach to water management [25];
- Support fair and equitable approaches that encourage improvements in water-use efficiency;
- Take a people-centred approach to reducing risk, engaging and empowering typically marginalised groups, such as the poor, migrants, indigenous people, women, youth, elderly and disabled [7, 8, 13];
- Support processes to improve governance and the rule of law [6];
- Take an adaptive governance approach that promotes resilience through collaborative, flexible and learning-based issue management across multiple levels [38, 39];
- Build effective social networks open to change and linked across stakeholder groups [40];
- Support change processes among influential individuals and groups [40];
- Encourage and support leaders across multiple levels of governance to promote radical change [40];
- Support a distributed governance model that encourages local groups to initiate and implement change [40];
- Develop processes that put new scientific and disciplinary knowledge into local context [40];
- Build capacity to change rules, move away from the status quo and develop unconventional ideas [40].

4.5 Prepare, Respond and Recover from Drought

The backbone of management and planning approaches to reducing drought risk includes the development of comprehensive drought monitoring and early warning systems.

Available actions include:

- Collect high spatial and temporal resolution baseline data on climate, soil, water availability/demand and socioeconomics, produce consistent drought risk assessment maps, data on impact and loss, and provide the public with free and open access to data [8, 13];
- Use data from future climate change modelling to support a long-term strategy that reflects estimated transformations caused by climate change;
- Collect and disseminate better drought indicators [41], including indicators on impact, damage, loss [22, 42] and vulnerability [43]. At a minimum, calculate common drought indicators such as SPI and NDVI;
- Design participatory, tailored and comprehensive drought monitoring and early warning systems, integrating multi-scale climate, soil, water and socioeconomic indicators [7, 13], along with real-time drought assessment products [8, 33] that provide key and timely information to support decisions;

- Use local and indigenous knowledge on drought characteristics, impacts and risks wherever feasible [22, 33];
- Build multi-sectoral, interdisciplinary, inter-country and regional-scale collaborations at each stage in the drought monitoring and early warning process [9];
- Build capacity for effective interpretation and usage of drought monitoring, early warning and short-time forecasting products;
- Implement the ten-step process to develop drought management plans [1, 3, 33];
- Design “build back better” approach that reduces risk and enhances preparedness to future droughts by utilizing effective and targeted investments during the recovery, rehabilitation and reconstruction phases [13].

4.6 Transfer and Share Drought Risks

Spread risks among wider section of society to include those benefit directly and indirectly from robust drought risk management.

Available actions include:

- Design and implement intelligent, risk-reducing financial strategies that finance relief, reconstruction and livelihood recovery – such as micro-insurance, insurance and reinsurance, along with national, regional and global risk pools;
- Develop weather index insurance and safety nets [20];
- Mobilize financial resources and involve private sector [8];
- Develop novel options for attracting private philanthropic investment and finance – for example, through a model comparable to the UNCCD Land Degradation Neutrality Fund;
- Take an integrated food-energy-water nexus approach to risk management that recognizes the risk and benefits for multiple sectors potentially affected by drought [46, 47];
- Improve communication and information-sharing process to increase awareness of risks associated with drought.

5 The Way Forward

The Drought Resilience, Adaptation and Management Policy (DRAMP) Framework is a new and integrated approach to drought planning. Six cross-cutting goals are included in the DRAMP Framework, each outlining pragmatic and practical actions for nations and communities to reduce risks, increase resilience and better prepare and respond to drought.

Central to the DRAMP Framework are the actions that embody the “three key pillars” of national drought policy:

- I. implement comprehensive drought monitoring and early warning systems;
- II. complete vulnerability assessments for sectors, populations and regions vulnerable to drought, and;
- III. implement drought mitigation measures that limit the adverse impacts of drought and provide appropriate response measures when drought occurs.

The DRAMP Framework extends the “three key pillars” by presenting many specific and practical actions available for nations to reduce risk – and not just to drought, but to the declining stock of natural capital within land and water systems as well. By taking an integrated approach, a drought management policy that applies the DRAMP Framework actions will increase social and ecological resilience to insecurity concerning food, energy and water, and it will protect biodiversity. The DRAMP Framework therefore aligns with international and multi-lateral agreements, as well as the Rio conventions.

A recommendation for countries developing drought management plans and policies is to use a multi-criteria type of assessment to identify which actions in the DRAMP Framework are most relevant in the national context. Due to the heterogeneity of the environment, economy and society within a country and across countries, not every action listed under the framework goals may be applicable. Assigning priority to actions according to their relevance and effectiveness would be a logical first step towards implementing the DRAMP Framework.

The DRAMP Framework technical guidelines³ provide examples of actions that have already been tested and implemented in achieving the goals of the framework. For example, the technical guidelines present an example of indicators and indices used in drought monitoring and early warning systems. Data and examples of drought vulnerability assessments are also presented. Decision-makers tasked with developing drought management plans and policies are urged to use the DRAMP Framework as a guide for the actions to be undertaken.

³See Crossman, N.D. (2018). Drought Resilience, Adaptation and Management Policy (DRAMP) Framework Supporting Technical Guidelines. UNCCD, Bonn, Germany

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