

Built for drought resilience

Proposing a global Drought
Resilience Capacity Index

SUMMARY FOR POLICY MAKERS



Acknowledgements

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Key messages

1. The proposed Drought Resilience Capacity Index (DRCI) provides a practical and comparable approach to monitoring drought resilience capacity at basin, national, regional and global levels. The proposed methodology requires further piloting, consultation and refinement.
2. The proposed Drought Resilience Capacity Index (DRCI) has the potential to support stronger and more coordinated global efforts to improve drought resilience capacity. Supported by continued multilateral cooperation and strengthened post-2030 arrangements, this could help align fragmented efforts into integrated action to support resilient ecosystems, societies and economies.

Drought is an increasing and systemic global risk

Drought comes in many forms and affects all countries. Drought is not only relevant for arid countries and regions. Even countries that are historically viewed as water abundant experience changes in rainfall which lead to changes or shortages in water availability, with knock-on socioeconomic impacts. With the definition of drought encompassing significantly reduced precipitation and its impacts, this report is important for all countries.

Drought is a macroeconomic, cross-sector risk to sustainable development, economic stability and human well-being. Global annual damages are estimated at USD 300 billion [1], but this is expected to be an underestimate. Water shortages have far-reaching impacts on food and energy production, livelihoods, infrastructure, ecosystems and public health, often compounding risks across sectors.

Drought impacts are intensifying as climate change manifests itself and pressures on land and water resources grow. Investing proactively in drought resilience is significantly more cost-effective than reactive crisis response, generating a "triple dividend" of avoided losses, enhanced productivity, and wider social and environmental benefits (see page 5).

Target audience: At the global and regional level, the report is intended for practitioners working in institutions linked to drought-relevant MEAs and related arrangements who are seeking to strengthen how drought resilience is monitored and reported. At the national and basin level, it is intended for practitioners seeking to develop or improve drought resilience within their own countries or river basins. It is also intended for finance and planning ministries, international financial institutions and investors seeking to better integrate drought risk into investment decisions, as well as for practitioners and policymakers working to ensure drought resilience policies and programmes are gender-responsive and socially inclusive.

There is a gap in a common global understanding of drought resilience capacities

A substantial body of indicators broadly relevant to drought exists across multilateral environmental agreements (MEAs) and related global arrangements. While these provide some information related to drought, they remain fragmented, designed for different purposes, and often embedded in broader multi-hazard approaches where drought is not explicitly distinguished. They therefore leave countries without a clear, integrated signal to guide policy and investment in drought resilience.

The proposed drought resilience capacity index provides a pragmatic, globally comparable and actionable signal to improve drought resilience

Many countries are getting better at monitoring drought and forecasting risk thanks to sophisticated early warning systems. But what is often less clear is whether the institutional, technical and financial capacities needed to anticipate, prepare for and adapt to drought are in place and effective.

This is the gap that the proposed Drought Resilience Capacity Index seeks to address.

Gender lens: In applying maturity levels for each indicator, 'inclusive' should be interpreted as a measurable feature of system performance. Higher maturity scores should require evidence that drought resilience systems are accessible and beneficial to women and marginalized groups, that affected groups participate meaningfully in planning and coordination, and that monitoring systems track differentiated outcomes. A system should not be scored as 'Integrated' or 'transformative' if it is operational at the national level but excludes women, local organizations or marginalized users from information flows, decision-making, finance or implementation benefits.

The three dimensions of drought resilience are aligned with the emerging definition used by the United Nations Convention to Combat Desertification (UNCCD) and the International Drought Resilience Observatory (IDRO). The DRCI is designed as a complementary "sister" tool to the Drought Resilience Index (DRI) currently under development by IDRO. While the DRI aims for a technically comprehensive, in-depth analysis of resilience across sectors and geographies, the DRCI offers a simplified, standardised self-assessment that countries can apply quickly, drawing on existing MEA reporting processes. The two approaches are intended to be mutually reinforcing, not duplicative.

Figure 1: The proposed Drought Resilience Capacity Index (DRCI) consists of three dimensions – anticipate, prepare and adapt – and nine interlinked indicators, covering the essential elements needed for drought resilience.

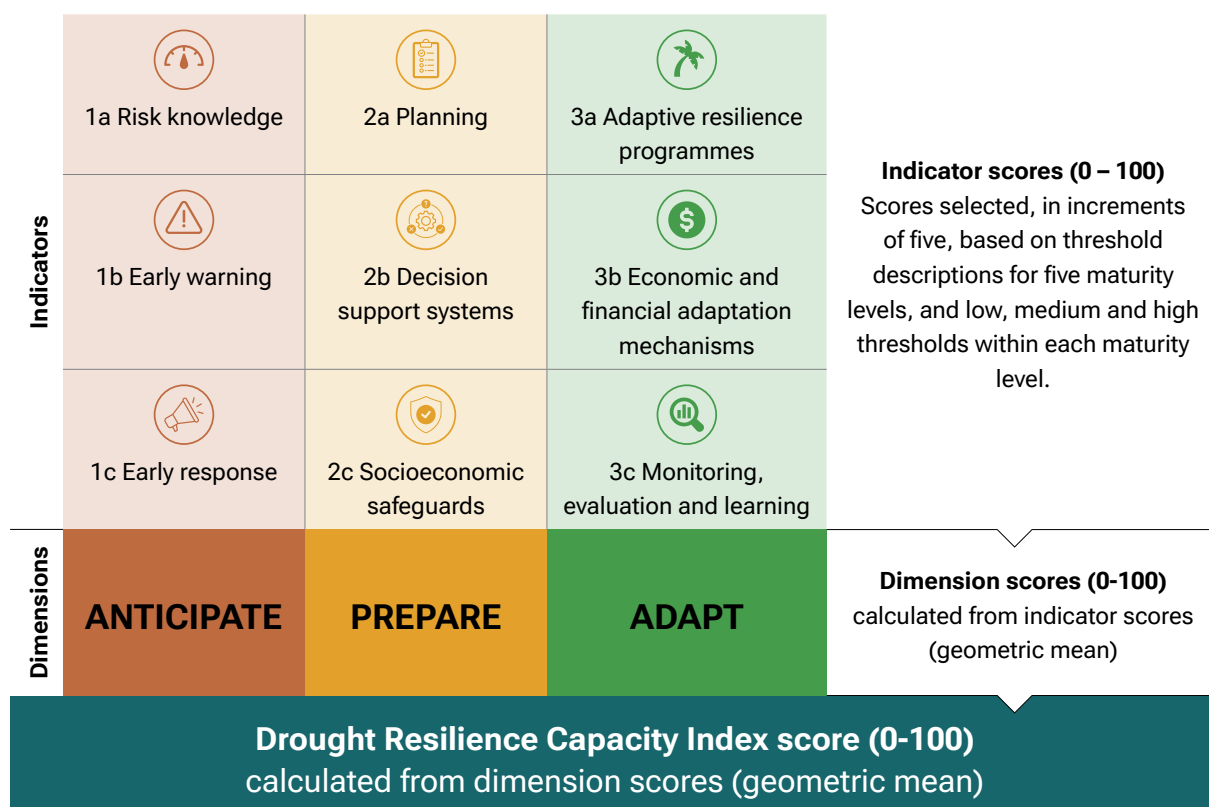


Figure 2: Policy interpretation: the overall index score can be communicated and interpreted through five maturity levels for drought resilience capacity

Transformative (81-100%)	Systems are adaptive, inclusive, and forward-looking, utilizing continuous learning and systemic innovation to consistently achieve resilience objectives while reducing underlying vulnerabilities
Integrated (61-80%)	Resilience capacities are fully institutionalized and routinely embedded within decision-making, supported by effective cross-sectoral coordination, sustained resourcing, and mainstreamed planning
Operational (41-60%)	Systems are functional and utilized by the majority of relevant authorities, showing increasing cross-sector coordination and alignment, though they are not yet fully integrated or routinely applied
Established (21-40%)	Basic systems and policies are approved, but their practical implementation, geographic coverage, and effectiveness remain uneven and inconsistently financed
Emerging (0-20%)	Resilience capacity is characterized by isolated pilots or ad hoc measures with fragmented coverage, weak institutionalization, and limited technical or financial capacity

Data collection is based on country consultation processes, and does not rely on complicated datasets. Objectivity in providing indicator scores is enhanced through: (a) detailed threshold descriptions for each of five maturity levels, specific to each indicator; (b) countries providing narrative responses to support the selection of scores; (c) involving the appropriate stakeholders to reach consensus on scores and narrative responses.

To reduce the reporting burden on countries, questions are aligned with existing global reporting processes, and a centralised organisation may provide a pre-filled survey for the country focal point to use as a zero draft for consultation with appropriate stakeholder inputs at the relevant levels.

The drought resilience capacity index supports prioritisation, investment and action at global, regional, national and transboundary levels

The index enables practitioners working on drought resilience at different levels (see “Target audience” above) to identify priority geographies and key issues where resilience capacity is lowest relative to risk, supporting more strategic resource allocation.

Disaggregating the index provides a simple diagnostic tool. In addition to the single index score, the dimension and indicator scores create a simple diagnostic matrix to help governments identify where resilience systems are strong and where targeted actions and investments are required. It can help decision-makers improve coordination across sectors and identify where action will have the greatest impact.

In the example below, while the index score shows that overall drought resilience capacity can be categorised as ‘established’, the dimension and indicator scores show which aspects of drought resilience capacity are stronger, and which are lagging (particularly in the ‘adapt’ dimension).

While the index provides a starting point, further consultation and analysis would be needed to identify appropriate interventions and implementation pathways. Importantly, this should include the identification of realistic funding sources, and interventions should be designed in alignment with specific funding streams to increase the likelihood of securing funding.

Proactive investment in drought resilience is significantly more cost-effective than investment in reactive crisis management. Investments in drought resilience generate a ‘triple dividend’ [2,3]:

- **Avoided losses:** Reduced damage to, among others, agriculture, infrastructure, livelihoods and ecosystems
- **Enhanced productivity and stability:** Improved water security, energy production, agricultural performance and economic resilience across a number of productive sectors
- **Wider social and environmental benefits:** Improved health outcomes, reduced poverty, stronger ecosystems and climate co-benefits.

Figure 3: Illustrative example of how indicator and dimension results allow identification of priority areas for investment and action.

Indicator maturity level	1a Risk knowledge Integrated (70)	2a Planning Operational (45)	3a Adaptive resilience programmes Established (25)
	1b Early warning Operational (45)	2b Decision support systems Established (35)	3b Economic and financial adaptation mechanisms Emerging (15)
	1c Early response Operational (50)	2c Socioeconomic safeguards Established (25)	3c Monitoring, evaluation and learning Emerging (5)
Dimension maturity level	ANTICIPATE Operational (55)	PREPARE Established (34)	ADAPT Emerging (12)
Drought Resilience Capacity Index score Established (28)			

The proposed index needs piloting and funding

The report is a first step in a technical conversation to create a Drought Resilience Capacity Index. The methodology requires rigorous piloting and ground-truthing in diverse national contexts to ensure it can account for different levels of socioeconomic development and physical drought manifestations.

Through regional consultation processes in the development of the index methodology, with participation from over 65 countries, more than 20 countries informally expressed interest in being involved in piloting the index. Country participation in the consultation process was informal, technical, and not part of any endorsement or negotiation process. Advancing the proposed index from theory to practice will require more detailed design and budgeting, and the identification of funding and implementation partners.

Drought resilience in global multilateral environmental agreements (MEAS)

While a substantial number of indicators exist across MEAs that are broadly relevant to drought, there are very few indicators specifically on drought risk and impacts, and even fewer specifically cover drought resilience.

Only one MEA explicitly covers drought through its targets and indicators: UNCCD’s 2018-2030 Strategic Framework, specifically Strategic Objective 3. Related indicators on drought hazard and exposure have good coverage, but the indicator on vulnerability currently has no publicly available data in the global portal (Figure 4). The proposed Drought Resilience Capacity Index is a potential approach to fill this gap.

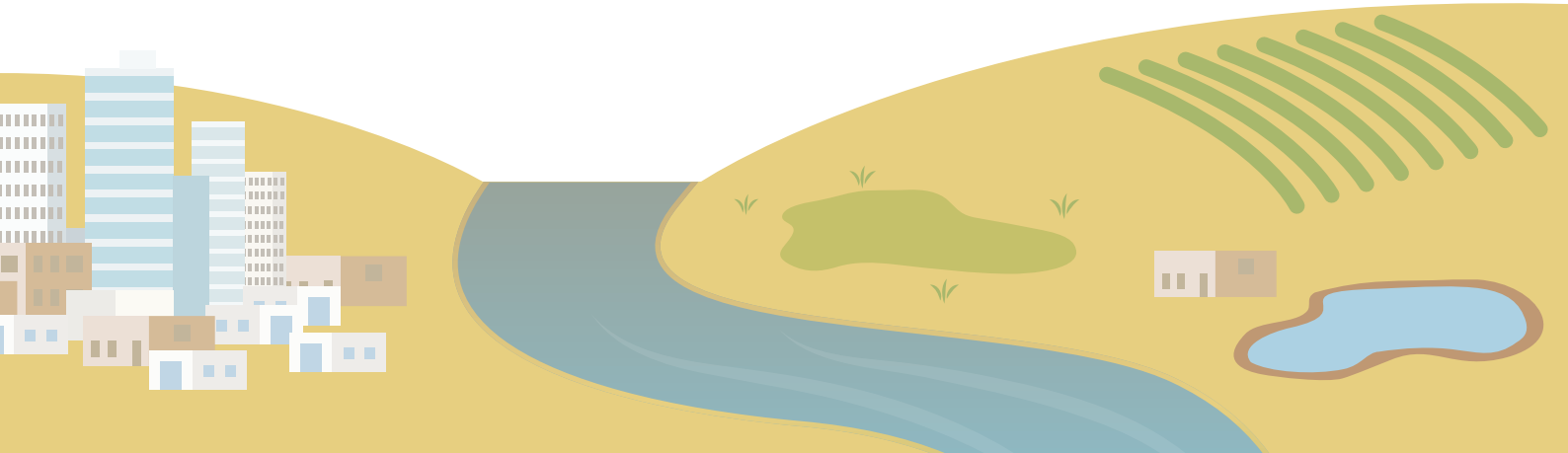


Figure 4: UNCCD Strategic Objective 3 on drought risk has indicator results on hazard and exposure, but a gap in vulnerability.

Drought Risk	=	Hazard	x	Exposure	x	Vulnerability
UNCCD Strategic Objective (SO) 3: To mitigate, adapt to, and manage the effects of drought in order to enhance resilience of vulnerable populations and ecosystems		SO3-1		SO3-2		SO3-3
Indicator data		✓		✓		?
Number of countries reporting (2022)*		107		104		0

* Publicly available through the [UNCCD Data Dashboard](#)

Two MEAs include drought as part of multiple disaster risk and climate hazards, but generally do not disaggregate results to show a picture specifically on drought: the Sendai Framework for Disaster Risk Reduction and the Global Goal on Adaptation's Belém Adaptation Indicators.

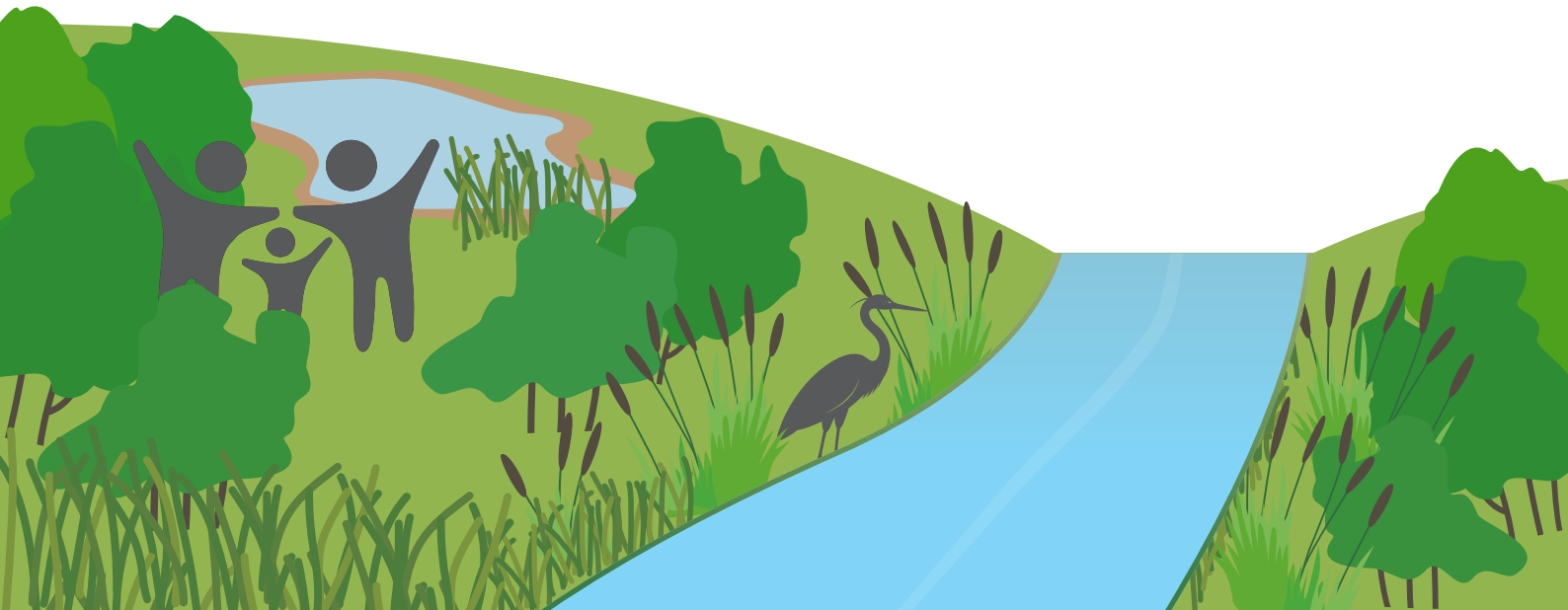
One MEA covers elements of drought risk and resilience indirectly through related development outcomes: Sustainable Development Goals.

Two MEAs cover elements of drought risk and resilience indirectly through a focus on ecosystems: the Global Biodiversity Framework (GBF) and the Convention on Wetlands.

While these six MEAs contain a large number of indicators indirectly related to drought, the post-2030 context provides an opportunity to elevate the profile of drought resilience, and to harmonise indicators and methodologies across global reporting frameworks.

References

1. Thomas, R., Davies, J., King, C., Kruse, J., Schauer, M., Bisom, N. et al. (2024). Economics of Drought: Investing in Nature-Based Solutions for Drought Resilience – Proaction Pays. Bonn, and Toronto: United Nations Convention to Combat Desertification, Economics of Land Degradation Initiative and United Nations University Institute for Water, Environment and Health. https://www.unccd.int/sites/default/files/2024-12/20241202_Economics-Drought-Web.pdf
2. Food and Agriculture Organization of the United Nations (2023). The Impact of Disasters on Agriculture and Food Security: Avoiding and reducing losses through investment in resilience. Rome. <https://doi.org/10.4060/cc7900en>
3. United Nations Convention to Combat Desertification (2023). Multiscale Approaches for the Assessment and Monitoring of Social and Ecological Resilience to Drought. A Report of the Science-Policy Interface. Bonn. <https://www.unccd.int/sites/default/files/2023-09/UNCCD%20SPI%20Drought%20Resilience.pdf>



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