Strengthening Land, Soil and Drought Resilience

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Perspectives for UN Convention to Combat Desertification
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As Parties to the UN Convention to Combat Desertification (UNCCD) continue to consider priorities for the post-2030 agenda, there is growing demand for partners that can help bridge the gap between global reporting frameworks and implementation on the ground. Governments, investors and development organisations also need support not only to monitor environmental change, but also to anticipate future risks, prioritise interventions and direct investment where it can deliver the greatest impact.

UK Centre for Ecology & Hydrology (UKCEH) is committed to supporting this agenda. Our multi-disciplinary expertise spans soil health, land degradation, drought resilience, hydrology, ecosystem and climate science, environmental monitoring and predictive modelling, enabling us to support both the development of future UNCCD methodologies and their practical application. Drawing on this expertise, we highlight three areas where UKCEH can support the UNCCD in strengthening land resilience, directing investment and accelerating delivery of sustainable land management outcomes as discussions continue on the Convention's future direction beyond 2030.

1. Advancing drought resilience and preparedness

Achieving the next phase of the UN Convention to Combat Desertification's drought agenda will require a shift from monitoring drought hazard, exposure and vulnerability individually to comprehensively understanding future risks and directing investment where it can have the greatest impact. UKCEH’s expertise in monitoring, forecasting and environmental modelling helps governments, development partners and investors identify emerging hotspots of drought vulnerability and prioritise interventions that strengthen long-term resilience.

Climate change is already increasing the frequency, severity and duration of droughts in many regions, while changing rainfall patterns and more frequent climate extremes are creating new challenges for land restoration, agriculture and sustainable land management[1]. Future implementation frameworks will therefore need to move beyond assessing current land condition to anticipate future drought risks, understanding the resilience of landscapes and communities and supporting longer-term planning and targeted resilience building interventions. This will require greater use of forward-looking climate and drought information, vulnerability assessments and scenario-based planning.

UKCEH has played a leading role in advancing the UNCCD's drought agenda, including developing the Good Practice Guidance for Strategic Objective 3, which provides countries with methodologies for assessing drought hazard, exposure and vulnerability[2]. We have also developed the Global Multi-Index Drought Monitor (GMID) and made it directly available to Parties, enabling higher-resolution drought hazard assessment and more robust reporting against Strategic Objective 3. Together, these contributions strengthen the scientific basis for drought risk assessment while translating reporting requirements into practical tools. Through our leadership of the World Meteorological Organization's (WMO) Hydrological Status and Outlook System (HydroSOS), we further support drought monitoring, forecasting and reporting capabilities by combining global datasets with national information systems, addressing technical and capacity gaps that can limit countries' risk assessment, decision-making and reporting under international frameworks.

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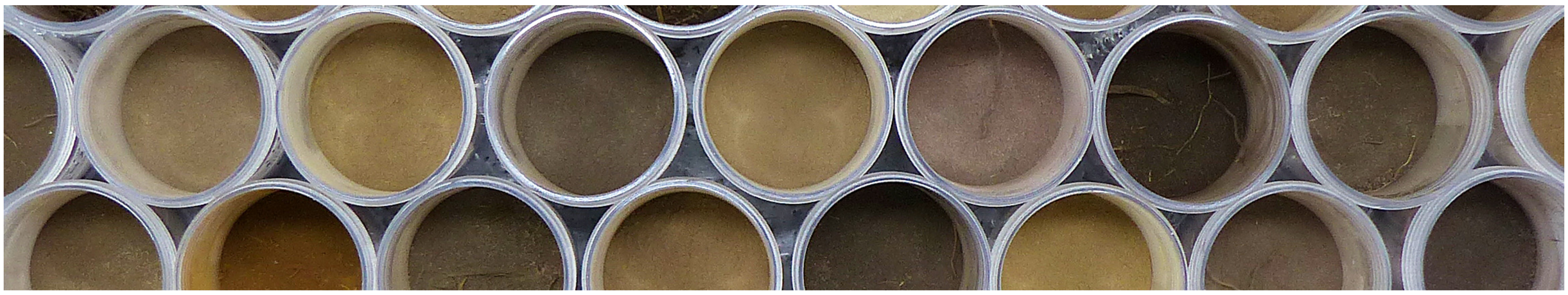
1. Advancing drought resilience and preparedness

Working with the UNCCD and international partners has also driven advances in drought science, improving approaches to drought risk assessment that better capture future climate conditions, compound hazards and changing patterns of drought exposure. By accounting for changing climatic baselines rather than relying solely on historical conditions, these approaches help countries to strengthen anticipatory action, preparedness and adaptation planning, rather than responding only once drought impacts have occurred.

By linking drought indicators with observed impacts on ecosystems, water resources, agriculture and livelihoods, we provide the evidence needed to support drought preparedness strategies, risk-financing mechanisms and investment prioritisation. This helps identify where drought risks are translating into the greatest impacts, enabling interventions and resilience investments to be targeted towards the landscapes and communities most vulnerable to future climate shocks. For emerging initiatives, like the Drought Resilience Investment Facility which aims to mobilise investment in drought resilience and nature-based solutions, this can help identify emerging hotspots of vulnerability before severe impacts occur, enabling finance and resilience interventions to be targeted proactively rather than in response to a crisis.



2. Strengthening soil health and land condition

Future Land Degradation Neutrality implementation should place greater emphasis on integrating soil health, resilience and climate adaptation more explicitly into monitoring and implementation frameworks. This would support earlier identification of risks, timely intervention and reduced costs of restoration. UKCEH can support the UN Convention to Combat Desertification by developing and applying soil health indicators, resilience assessments and risk-based approaches that identify where degradation is emerging, where resilience is declining and where investment is most likely to deliver lasting impact.

Land degradation is often detected only once its environmental, social and economic impacts are already being felt. As UNCCD looks beyond 2030, there is an opportunity to strengthen implementation frameworks by identifying degradation risks earlier and improving understanding of the factors that underpin long-term landscape resilience, particularly soil health. Healthy soils underpin biodiversity, water storage and infiltration, agricultural productivity and climate resilience, making them a valuable indicator of both current land condition and future vulnerability. This is becoming increasingly important as climate change, drought, land-use change, invasive species and pollution interact to place growing pressures on landscapes and ecosystems.

The three Land Degradation Neutrality (LDN) sub-indicators of SDG 15.3.1 provide an essential foundation for assessing land condition globally and are particularly effective at capturing land-use change and productivity decline. However, UKCEH research from national implementation shows that they may be less sensitive to earlier forms of degradation in established agricultural landscapes and the risk that improvements in productivity can mask declines in underlying soil condition, creating misleading signals of improvement while degradation processes continue[3]. As a result, opportunities for preventative action may be missed until degradation becomes more severe and costly to reverse.

The UK Centre for Ecology & Hydrology is an independent research institute specialising in environmental science, providing global leadership on issues spanning land, water and air.

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2. Strengthening soil health and land condition

For the UNCCD, the challenge is not only understanding where degradation has already occurred but identifying where hotspots of degradation are likely to emerge and where restoration, climate adaptation and sustainable land management investments are most likely to succeed. Integrating soil health information alongside existing LDN indicators could help governments, development partners and investors distinguish between areas requiring urgent intervention, areas where resilience can be strengthened through preventative action, and areas where investment can deliver lasting long-term environmental, socio-economic returns. Earlier identification of degradation can support preventive action, helping avoid the higher costs associated with restoring degraded landscapes.

Historically, limitations in soil health data and the lack of harmonised approaches for assessing soil condition have constrained the inclusion of additional soil indicators within global frameworks. Working with international partners, through initiatives such as the African Union Soils Observatory and AI4SoilHealth, UKCEH is helping address this challenge through research that delivers soil health information at scale, including indicators, thresholds and resilience assessments relevant to policymakers and practitioners[4]. These collaborations are also advancing understanding of how multiple environmental pressures interact to shape soil condition, ecosystem resilience and future vulnerability, providing the evidence needed to identify emerging risks, prioritise interventions and assess where restoration and resilience investments are most likely to succeed.

3. Integrating soil, land and water evidence for action

Effective investment targeting depends on understanding not only where degradation exists today, but where future risks are likely to emerge and where interventions can deliver lasting benefits. UKCEH can support the UN Convention to Combat Desertification by integrating soil, land, water and climate evidence to help policymakers, investors and delivery partners prioritise action and maximise the impact of investments.

Land degradation, drought and water insecurity are interconnected challenges, yet they are often assessed through separate datasets, reporting systems and policy processes. As initiatives, such as Business4Land, seek to scale investment in resilient landscapes, there is growing demand for integrated approaches that can connect environmental evidence with decisions on where to act and how to reduce risk. By combining field observations, environmental monitoring and predictive modelling, UKCEH is helping advance understanding of how land degradation, drought and water insecurity interact across landscapes, and translating complex environmental evidence into practical insights that support restoration, adaptation and resilience investments[5]. Our integrated approach brings together soil, land, water and drought evidence, enabling policymakers and investors to make decisions that consider how environmental challenges interact across landscapes to identify opportunities that deliver multiple benefits and improve the long-term success of restoration and resilience investments.

A partnership for impact

The challenges of land degradation, drought and climate resilience require partners that can bridge the gap between scientific evidence, implementation and investment. UKCEH stands ready to work with the UNCCD, its Parties and delivery partners to help develop the methodologies, indicators and decision-support approaches needed to accelerate progress towards more resilient landscapes and communities.

To explore opportunities for collaboration please contact Melissa Allan, International Relations Coordinator, UKCEH melall@ceh.ac.uk

References

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