



What is the issue?

Drylands are ecosystems, such as rangelands, grasslands and woodlands, which occupy over 40% of the terrestrial surface, and are characterised by high

the 21st century, with as much as 80% of this expansion occurring in developing countries.

The dramatic shifts in rainfall patterns caused by climate change are expected to affect both the quantity and distribution of water. Loss of vegetation could lead to the hardening of the soil surface, increased water runoff and consequently reduced ground water recharge. The frequency and intensity of droughts are also expected to increase with climate change. This is of particular concern in drylands, No ' c climatic variations.

Climate change is likely to accelerate land degradation, referred to in drylands as desertification. Land degradation is defined as an

components of the soil, and the subsequent land productivity.

Converting dryland areas to other uses, cropland, can also cause land degradation result in the loss of up to 60% of soil organic matter below ground, and up to 95% of above-ground. These losses contribute directly to greenhouse gas concentrations in the atmosphere, and reduce the capacity of drylands to sequester carbon.

Due to the biophysical, socioeconomic and

People and species living in drylands have adapted

Plants and animals such as the African elephant and the Bactrian camel in Central Asia have developed unique physiological and behavioural adaptations. Human populations have similarly adapted management and behavioural strategies that enable them to use highly variable resources.

However, climate change is presenting an unprecedented threat to drylands with far reaching environmental, social and economic consequences. Climate scientists predict that global drylands will expand by up to 10% under a high greenhouse gas emission scenario by the end of

drylands to environmental shocks including climate change.

Why is this important?

Drylands are home to more than two billion people, and are the source of a large proportion of the food and fibre used around the world. Grasslands alone produce 27% and 23% of the world's milk and meat respectively, and **support more than one billion livelihoods**.

The complex changes in land productivity and **disruption of dryland ecosystems due to climate change will affect more than 44% of the world's food system**, contributing to food insecurity and persistent poverty. Unreliable water resources will also have a negative impact on land productivity and consequently on livelihoods.

Dryland soils store at least one third of the world's soil organic carbon, which is important in enhancing soil structure and function, and determining soil productivity. Grasslands hold more than 10% of the terrestrial carbon and can store up to 70 tonnes/ha of soil carbon.

Grasslands, especially those dominated by perennials, can withstand conditions of high temperature and high carbon dioxide (CO₂) concentrations more than most other plants. These qualities mean that grasslands provide opportunities for adaptation and can continue to produce forage for grazing livestock as atmospheric CO₂ concentrations and temperatures increase due to climate change.

What can be done?

Conserving and restoring drylands presents an enormous opportunity to address climate change in this unique environment.

Investing in dryland restoration is a cost-effective approach to climate change mitigation. Maintaining soil health, and the organic carbon in the soil, can be achieved by increasing vegetative plant cover. Restoring dryland ecosystems improves their health and functioning, including enhancing nutrient cycling and the ability of soils to absorb and store carbon and water.

The key to climate change adaptation in drylands lies in recognising and respecting the role of traditional governance structures and practices in building resilience to extreme events. These adaptation strategies include planting drought-tolerant crops, water-efficient cropping practices, herd

diversification practices that keep mixed herds of cattle, camel, sheep or goat, and maintaining livestock mobility across communal lands and borders. Policy processes governing dryland development should therefore strongly engage with communities within their existing local governance framework.

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Mobility is a complex but key adaptation strategy to climate change in drylands. It hinges on the opportunistic exploitation of sporadic grazing and water resources. Mobility is rooted in a larger system of governance, rights and responsibilities that allow communities to manage and share resources through long-term traditional tenure agreements. It allows humans and livestock to use the vast natural resources in a landscape without overexploiting