

Desertification, Drought and Environmental Security

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Desertification is land degradation in drylands, expressed in a persistent reduction in biological productivity (natural, rangelands and cropland productivities). It is caused when dryland soil loses its minerals and organic matter through erosion and/or becomes salinized. Drylands are prone to desertification, by virtue of their thin soils whose vegetation cover is sparse, due to inherent water scarcity, a result of low precipitation and high evaporation. But the sparse plant cover is engaged in soil development, soil conservation and water regulation, leading to sustained forage and crop productivity. These functions of the dryland vegetation constitute environmental, or ecosystem "services", on which the livelihood of dryland people critically depend. Indeed, though drylands occupy 40% of global land (ca 99% of the Middle East) and are inhabited by a third of humanity, only 10 – 20% of the drylands are apparently desertified (the extent of Middle East desertification has not been determined). Yet, there is a high risk of further, accelerated desertification due to soil erosion and salinization driven by demographic, social, economic and political factors that result in an excessive human pressure that taxes the provision of the drylands' ecosystem services. Thus, the aspirations for increased provision result in reduced biological productivity. This breach of environmental security leads to poverty, malnutrition, migrations, and refugees, social and political strife, which are often trans-boundary or even affect non-dryland areas and countries.

Unlike desertification, drought is a natural phenomenon. Traditionally dryland people learned to live with droughts, and once drought was over, sustainable productivity resumed. Yet currently, when humans expose the dryland to desertification risks, a subsequent drought is likely to make these risks materialize, such that when the drought is over, pre-drought productivity is not restored, and desertification prevails. Global Climate Change is predicted to increase the frequency of droughts, what will shorten the between-drought periods critical for productivity restoration. Furthermore, desertification exacerbates climate change, since the loss of soil and of biological productivity impairs the drylands' high potential for carbon sequestration. Thus, the downward spiral of desertification is accelerated by the feedback relationships with climate change.

In spite of increasing demand for dryland productivity, desertification can be avoided and dryland environmental security can be maintained. Cases are known whereby reduced productivity motivated ingenuity, innovations and adaptations that increased productivity while maintaining environmental integrity and economic sustainability. In addition, recently emerging traditionally non-dryland livelihoods that do not impact land resources and do not tax land-related ecosystem services, show promises. These include dryland aquaculture, dryland afforestation, dryland tourism and the production of renewable energy. These livelihoods capitalize on dryland attributes such as the abundance of sunlight, space and wilderness, what makes them not only sustainable, but also economically competitive compared to same livelihoods when practiced in non-drylands. The Middle East is no exception to the global trends of desertification, its security risks and mode of abatement.