



## Land degradation and restoration: The North African experiences

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The North African steppe, a key area whose economic activity is based on agro-pastoralism, covers 75 million hectares. This steppe underwent significant degradation in the eighties. The combination of severe droughts, the most important of the century, with a peak between 1982-1987 and 2000-2005 and an exponential increase in livestock had a catastrophic impact on pastoral resources. The "alfa" (*Stipa tenacissima*), an emblematic species of these arid lands, what was called "sea to alfa" is now disappearing. Vegetation cover, which was more than 30% before 1980, is now less than 15%. Concerning the phytomasse, the aboveground dry matter production which exceeds 1ton ha<sup>-1</sup> in 1980, is now less than 480 kg.ha<sup>-1</sup>. At the same time, the agricultural areas in the steppe area, previously marginal, are steadily increasing and reaching several million hectares. This cereal production takes place to the detriment of natural ranges with very low yields (less than 5 quintals per hectare). In response to this deterioration, the North African governments, from the seventies defined different strategies to manage and restore the ecosystems. These ones, based on a socio-economic approach were in summary:

(1) To increase pastoral and agricultural production; (2) to reduce livestock; (3) to combine the first two. Several options were considered. The main ones were planting, collecting water for livestock and agriculture and finally installing exclosures. Agro-forestry plantations were carried out with different species, particularly the genus *Atriplex*, *Medicago* and *Opuntia*. Small hydraulic entities were also built to increase the planted area. The exclosures were established on millions of acres. We discuss the relevance and success rate of these works. The economics and biological impacts (biodiversity, production) are assessed. As a result, the government's strategies are not coherent and sometimes seem at odds with the objectives of combating desertification. Worse yet, in some cases, through their inconsistencies some governments seem paradoxically to be supporting the steppe degradation. This underlines the complexity of the problem.

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