

SOIL FERTILITY MAINTENANCE

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DESERTIFICATION PROBLEMS AND CONTROL

By T. U. U. Ekpo

The term desertification is the change of productive land ultimately into a desert as a result of continuous land abuse by man. Dregne (1978) looked at it as the process of deterioration in terrestrial ecosystem and this is measured by reduced potential of desirable plants and increased hazard for human occupancy.

Giants and Orlovsky (1983) encompassed the concept to mean land degradation process involving a continuous change from zero degradation to a very severe degradation. Therefore desert encroachment arises as a result of severe land abuse by man and it can occur even in the humid areas of the world.

Tolba (1984) reported that about 2.30 million people are directly threatened by desertification and altogether 3.5 billion hectares of the world rainfed cropland and irrigated land are affected and every year a further 21 million hectares are reduced to a state of near of complete uselessness. Many developing countries are now incorporating the problem of desertification into their rural development programmes and environmental policies. There is no doubt that desertification is a serious threat in semi-arid and arid regions of the world. In these regions, there is an increase hazard of land degradation triggered by agricultural activities.

In the light of the above, this chapter aims at highlighting the problem of desertification and also makes some recommendations to control the threat in the tropics.

THE GLOBAL SPREAD OF DESERTIFICATION

The semi-arid regions are characterised by scanty rainfall, frequent wind storm and poor plant cover. These ecosystems are deliberately unbalanced especially during drought. The climate factors in the arid and semi-arid areas make the sensitivity of this dryland ecosystem fragile land use. The intensification of land use may make recovery difficult and desertification will then set in.

In Africa, parts of Lesotho, Morocco, Tunisia, Egypt, and Ethiopia are facing desertification hazards. In Nigeria, desertification risk occurs in Sokoto, Kano, Katsina and Borno States. The rate of desertification is bound to rise with the increased rate of soil abuse aimed at earning a living in already degraded environments.

The qualification of areas under desert status in arid regions of the world is shown in table 11.1. It is clear that slight desertification had already taken place in Africa as far back as 1986. However, very severe desertification has occurred in some parts of Asia resulting in very poor plant cover.

Table 11.1. Desertification of the Arid Lands of the world.

Desertification class	sq.km.	plant cover	% Land Affected
Slight	24,520,000	Good	18(Africa)
Moderate	13,770,000	Fair	27(N.America)
Severe	8,700,000	Poor	22(S.America)
Very Severe	73,000	(V. Poor) (Totally denuded)	20 (Asia)
Total	47,063,000		

Source: (Dregne, 1986)

DESERTIFICATION PROBLEMS

i. OVERGRAZING

This is a term used to, designate the use of too many animals grazing on area longer than necessary. However, the type of vegetation, soil moisture content, climatic conditions and kind of animals can influence the magnitude of overgrazing. It is a serious desertification problem in the Sudan-Sahel and arid regions of the world where animal rearers formed the bulk of the farming population.

Pastoralism characterizes the great arid belt of Africa and other contents of the world. Since 1970, 80 percent of all cattle in Nigeria are owned by the Fulanis who are found in the Savanna region of Nigeria (Bond, 1993). About half of the world's cattle, 1/3 of its sheep and 2/3 of its goats are contained in the arid and semi-arid zones where animal population densities are far beyond carrying capacity (Bondet, 1975).

The effect of overgrazing on vegetation is shown in fig 11.1. The loss of gene pool of desirable species and soil degradation are the consequences of overgrazing.

GRAZING IMPACT ON VEGETATION

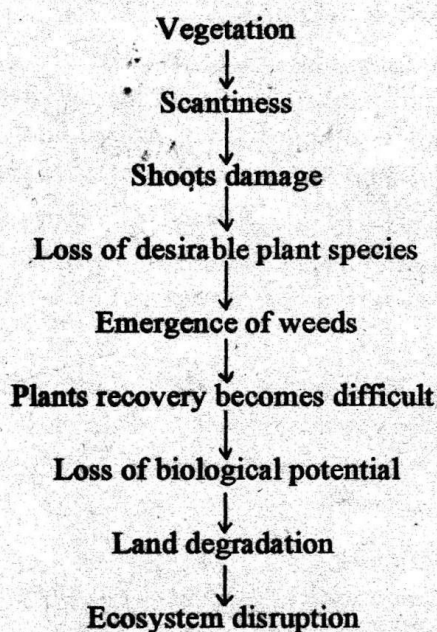


Fig 11.1: Grazing impact on vegetation

ii. CONTINUOUS CROPPING ON MARGINAL FARMLAND

Continuous cropping is the cultivation of arable crops on the same piece of land with fallowing period too short to replenish the soil nutrients. The fallowing period may not exceed a season.

Farmers embark on this act of cultivation when land and foodstuff are scarce while population is dense. Continuous cropping is a desertification problem in a delicate environment such as arid and semi-arid areas. The environmental consequences of continuous cropping include loss of soil fertility, poor plant cover, soil compaction etc. such farmlands are prone to erosion and result in severe land degradation.

Marginal farmland can be termed as a land area with little or no potential for sustenance agriculture. Introduction of continuous cropping on a marginal farmland is a common practice in semi-arid and arid zones of the world. The practice often leads to environmental degradation and result in a desert status.

iii. DEFORESTATION, BULLDOZING OF FARMLAND AND INDISCRIMINATE BURNING

Deforestation (wanton tree destruction), bulldozing of farmland and indiscriminate bush burning are soil abuses capable of exposing the soil to serious danger of desertification in the arid and semi-arid zones of the world. Recovery or regeneration of tree species seems difficult after being destroyed particularly during the drought period which characterises the arid zones of the world. It should be noted that bulldozing of fragile soils is a strong and the quickest weapon to cause disruption of delicate ecosystem.

SOLUTIONS TO DESERTIFICATION PROBLEMS

The following suggestions would be useful to limit desertification problems.

- i. Overgrazing should be discouraged by spreading the stocks over large improved established pasture using a rotational grazing system.
- ii. Overgrazing on marginal farmland should be avoided and the productivity and sustainability of each major type of land use should be developed, for instance, alley-cropping and agroforestry.
- iii. Provision of employment and vocational skills to the arid dwellers to alleviate poverty which is the major driving force to continuous cropping and farming on the marginal farmland should be viewed seriously by the governments at local, state and national levels.
- iv. Task force on control of environmental resources should be intensified to control indiscriminate burning, deforestation and bulldozing of farmland in each local government area while the already degraded land should be reclaimed by planting adapted tree species to the environment.
- v. The herdsmen should be educated on the danger of desertification and its hazards on human occupancy.
- vi. They should also be properly oriented that both resources of land and animals need equal security for present and future use while proper destocking should be intensified during drought.

CONCLUSION AND RECOMMENDATIONS

Desert encroachment predominantly occurs in arid and semi-arid regions of the world due to the interaction between man and the delicate environment.

Overgrazing, continuous cropping on marginal farmland, deforestation and indiscriminate burning may have less impact in humid and semi-humid environments than in arid zones where small changes can trigger profound disruption of the ecosystem leading to desertification.

There is need to identify technologies that encourage farmers in the dryland ecosystem to practice land use conservation. Actions should be intensified in the prevention of the causes of desertification by adequate implementation through special task force on the control of environmental resources.

REVISION QUESTIONS

1. Define the term desertification.
2. Critically identify and discuss the factors that can enhance desertification.
3. Explain how desertification problems can be effectively controlled in Nigeria.

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