

Desertification in Balochistan-Pakistan: Suggesting Some Remedial Measures

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Abstract

Desertification is a worldwide phenomena and a constant threat to mankind. The human activities for his survival lead to overstressing over the land resources and ultimately destruction of delicate ecological balance. The overuse of soil resource and imbalance in ecosystem enhance denudation, erosion soil salinization, deforestation and ultimately transformation into step land and desert. In order to outline the causes of Desertification in Pakistan: the largest province of the country in terms of area- the Balochistan has been selected. Balochistan extends over a large area in the SW of Pakistan with an area covering 347,190² Km about 44 percent of the total area of the country. The province is a vast plateau with most of the area over 600 meters above mean sea level. On the whole, land is rugged and barren with the main desert areas of Balochistan are situated in the western part of the province, mostly in Kharan and Chagai districts. The area being situated in arid regions of the world has a fragile ecosystem, which is very prone to desertification. The aim of this paper is to find the causes of rapid desertification and to suggest some possible measures to control it.

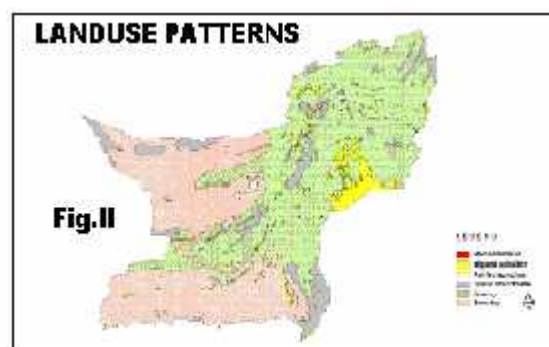
Introduction

Pakistan is predominantly an arid and semiarid country and is threatened with desertification and degradation of land due to rapid increase in population and growing pressure on the natural resource base to meet the needs of the people. In Pakistan's province of Balochistan, desertification is far advanced by all international standards and has been accelerating in the past two decades. Balochistan is the biggest province of Pakistan by area; 347,000 square kilometers. This comes to 44% of total landmass but its population of 6.6 million is only 5 % of country's total population. The area is characterized by arid climate predominantly. Most of the areas receive only 150 mm rainfall annually, mostly in winter season when it is not much needed because plants are in dormant condition. Its 85 % population of total 6.6 million lives in rural areas in small settlements. Agriculture and livestock are the main economic activities in the rural areas. According to 2002-03 figures its cultivated area is 1.99 m hectares, irrigated areas by all means counted for 0.89 million hectares, non irrigated is also 0.89 million hectares. Whereas, culturable waste is 4.83 million hectares and rangelands cover 21 million hectares. Area under forest was 1.36 million hectares in the province during 2002-03. In Balochistan irrigation in three out of 26 districts is done through canal system. In two districts (Naseerabad and Jaffarabad) the canal irrigation system is a part of Indus water basin. Its total cultivated area in 2002-03 was reported as 1.99 million hectares. The agriculture, in 23 districts of total 26, is done through control of floodwater, rain, Karezes, springs and tube wells. Presently there are 800 Karezes and more than 21000 tube-wells in the province. Area above 1000 meters altitude has been classified as highland in the province. Desert areas of Balochistan, have acute problem of shifting sand, while water logging and salinity affect irrigated lands. Only about 1.05 million hectares of its total land mass is covered with forests, which is too low to cater for the environmental and socio-economic needs of the province.



Fig.1

The rate of deforestation is very high, which is causing innumerable problems including land degradation, loss of soil fertility, soil erosion, flash floods, loss of biodiversity, reduction in land productivity and many associated environmental problems. Dry land areas of Balochistan are faced with increasing desertification, primarily due to improper land use management, uncontrolled livestock grazing, and illegal removal of vegetation. Desert areas are subjected to the acute problems of shifting sand dunes and salinity. Underground water resources in the western dry mountains of Balochistan are shrinking, due to very little recharge and over-exploitation of the meager water resources of the region. The productivity of arid rangelands is adversely affected by heavy livestock pressure and utilization of these rangelands beyond their carrying capacity.



Methods and Material:

Causes of Desertification in Balochistan:

Following is the brief description and the extent of some direct and indirect causes of land degradation and desertification in Balochistan-Pakistan.

(i) *Wind Erosion:*

Land degradation by wind erosion is a major issue in arid regions of Balochistan (Chagai Desert and sand areas along the coast). Areas surrounded by human habitations are mostly affected by this menace. The major land-degrading factor is the over-exploitation of rangelands for firewood collection and livestock grazing.

(ii) *Deforestation:*

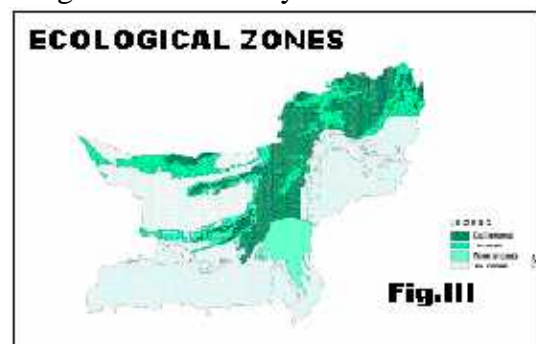
Balochistan has very high rate of deforestation as compared to other areas of the country. The forest cover and woody biomass is shrinking fast. Every major forest type or protective cover has suffered from indiscriminate cutting, over-grazing, poor management and many other man-made ecological changes. All these factors are contributing to land degradation and soil erosion, especially in forested areas of Balochistan.

(iii) *Uncontrolled Grazing of Livestock:*

Free grazing of livestock could be very destructive to rangelands and high-pastures. Due to ever increasing livestock populations, there is heavy pressure on natural vegetation. Uncontrolled grazing of livestock reduces productivity of rangelands due to soil compaction, removal of vegetation from fragile slopes, and destruction of terraces.

(iv) *Prolonged Drought:*

During last 6 years Pakistan suffered from severe drought due to a prolonged dry spell, causing severe water shortages for humans, livestock, and agriculture. Many areas of Balochistan were badly hit by drought. The drought also severely affected livelihoods and forced local people to migrate toward cities in search of work and food. This disrupted traditional resource use patterns and resulted in the loss of traditional management practices and property. In many areas people opted for changing their livelihood and became sedentary placing greater pressure on the natural process to regenerate the water and land resources.



(v) Population Pressure:

The population of Balochistan is 72,00,000 souls and is growing at the rate of 2.1% per annum, which is considered to be a challenge to economic development and poverty alleviation as it generates increasing demand for limited land resources of the province. The implications of such a rapidly growing population will be immense. This will lead to fragmentation of farmlands and add further pressure on fragile and marginal lands by denudation of natural forests and rangelands.

(vi) Stress of Poverty:

Over the past decade, poverty levels have increased in rural areas while they declined in urban areas. About one-third of the total households in the province were considered below the poverty line, whereas poverty levels in rural areas remained close to 40%. Poor people tend to exploit their limited land resources more intensively to meet the immediate and pressing needs even if exploitation compromises the long-term stability and viability of the land and its natural resources.

(vii) Poor Coordination among Line Agencies:

Land degradation issues cut across several sectors, hence many ministries and line agencies are involved in the management of land resources. These agencies have taken certain steps to address land degradation problems. However, there is no coordinated effort to rehabilitate degraded areas or to combat desertification processes through cross-sectoral interventions. There is very limited sharing of the lessons learnt from different interventions, as there is no federal or provincial mechanism to coordinate efforts and share the success stories.

(viii) Information and Knowledge Gap:

There is insufficient quantitative data on current land use in arid and semi-arid regions of the province as well as status and trends of natural resources. Whatever information is available is scattered across many agencies and institutions and is not readily available to researchers, planners, and policy makers, impeding the full assessment of land degradation and desertification problems and the quantification of economic losses to the region. There is need to develop appropriate data basis and geographical information systems to encourage integrated planning at the desertified areas at ecoregional level.

(ix) Lack of awareness:

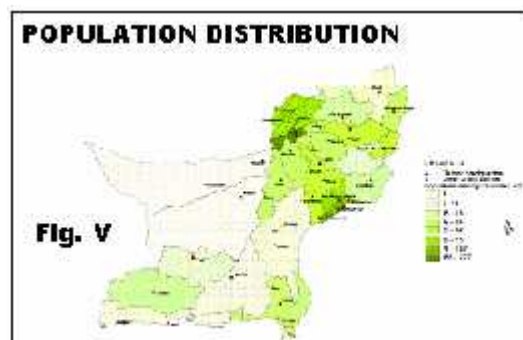
Communities in dry land areas are generally aware of land degradation issues and have knowledge of the resources available in their vicinity. They are, however, unaware of the full consequences of land degradation and desertification. Similarly, there is very little knowledge of land degradation and desertification issues among the general public, planners and policy makers and even among those who are directly responsible for the management of land resources.

Discussion and Results

In order to combat the rapid desertification in Balochistan the following remedial measure are recommended:

(i) Sand dune stabilization in Chaghi and Kharan districts of Balochistan to enhance stability of soil structure, crop productivity, and fuel and fodder production as well as to protect communication networks and other infrastructure from moving sand dunes.

(ii) Soil and water conservation by increasing water use efficiency, rain water harvesting, reducing soil loss through increasing vegetative cover, encouraging dry land afforestation, promoting dry land farming, and soil conservation measures. There are number of on-going and pipeline projects, which are addressing on-farm water management issues especially in irrigated areas. The funds shall be made available for introducing innovative techniques for harvesting rainwater in dry land areas.



(iii) *Promoting sustainable agriculture practices* for enhancing productivity of dry land farming in selected districts of Balochistan. This will involve introduction of high-yielding and drought resistant varieties, encouraging crop rotation to recycle nutrients, laser land leveling, bed-and-furrow irrigation techniques, rain water harvesting techniques, and improvement in agriculture extension and marketing services as well as encouraging farmers to establish windbreaks and shelterbelts to reduce the impact of water or wind erosion.

(iv) *Sustainable management of degraded arid rangelands/pastures* in Quetta, Pashin and Qila Saifullah in Balochistan, with participation of pastoral communities for improving productivity of rangelands and combating desertification. This will involve managing livestock stocking density, encouraging rotational grazing systems, developing watering points, reviving traditional grazing management regimes, developing and implementing village-based sustainable range management plans as well as encouraging graziers to retain indigenous livestock varieties to minimize losses from prolonged droughts and other extreme climatic events.

(v) *Planting of suitable forage species*

Due to arid climate, shrubs and grasses viz, *Atriplex canescens*, *Chrysopogon aucheri*, *Stipapennata*, *Enneapogon persicum*, *Agropyron desertorum*, *Oryzopsis*, *Elymus junceus* and *Eragrostis curvul* are recommended to be introduced in Balochistan to control desertification.

(vi) *Promoting indigenous sustainable land management practices* in dry land areas of Balochistan. This will involve documentation of indigenous production and irrigation systems and promoting their use by the farmers and livestock

(vii) *The growing demands for timber, firewood, and non-timber forest products* for sustaining local livelihoods have driven many rural communities to the extreme fringes of poverty. The GoP is trying to meet the growing demand of energy through introduction of alternate energy sources, like Liquid Petroleum Gas (LPG), solar energy and provision of natural gas in some hilly towns such as Ziarat and Kalat in Balochistan.

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