



Desertification in the World

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Abstract

Desertification is the diminution or destruction of the biological potential of the land that can lead ultimately to More than 75% problem of desertification is affected by uncontrollable climate events and population growth. Drought is also playing important role in land degradation by reducing water supplies in the affected areas. It is also related to manmade man activities i.e., .deforestation, cultivation, range land grazing and improperly use of irrigation technology which is responsible for land degradation and also increase of Salinization in the land desert like conditions. It is an aspect of the widespread deterioration of the ecosystems and has diminished or destroyed the biological potential. Transfer, share and disseminate such knowledge and required technology from north to south and vice-versa.

Keywords: Desertification, Forests, Lands.

1. Introduction

Land degradation has affected some 1900 million hectares of land world-wide. In Africa an estimated 500 million hectares of land have been affected by soil degradation, including 65% of the region's agricultural land. The rate at which arable land is being lost is increasing and is currently 30-35 times the historical rate. The loss of potential productivity due to soil erosion world-wide is estimated to be equivalent to some 20 million tons of grain per year. This is not related to Africa or Asia but it is occurring worldwide. Both natural and human causes combine to accelerate desertification.

Deserts cover about one fifth of the earth's surface and occur where rainfall is less than 50/year. Although most deserts, such as the Sahara of North Africa and the deserts of the southern-western US, MEXICO and Australia are present at low latitudes. COLD DESERTS are also known, they are present in the basin and range of Utah and Nevada and in parts of western Asia. Most deserts contain specialized vegetation, as well as vertebrate and invertebrate animals. Soils of deserts have abundant nutrients and there is requirement water to make very productive. There are relatively few large mammals in deserts because most are capable of storing sufficient water and with standing heat. Deserts generally give little shelter from the sun for large animals. The dominant animals of warm deserts are non-mammalian vertebrates for examples reptiles. Mammals are usually small, like the Kangaroo mice of NORTH AMERICA deserts.

2. Major Types of Deserts

(2.1). Hot and Dry Deserts

Such types of deserts are present in the southern Asian realm, Neo-tropical (south and central America) Ethiopian (Africa), Australian. North American deserts of Chihuahuan, Sonoran, Mojave and Great Britain. They are throughout the year and too hot in the summer. Very

less rain fall occurs in the winter seasons. Everyday temperature is very high due to atmosphere having low humidity to restrict the sun's rays. Desert surface receive a little more than twice the solar radiation received by humid regions and lose almost twice as much heat at night. Annual average temperature range from 20 to 25 degree centigrade, the maximum ranges from 43.5 to 49°C and minimum temperature some time drop to -18°C. Rainfall is very little and there is very long rainless period. Evaporation rates regularly increased rainfall rates. Sometimes as soon as rain occurs and evaporates before reaching the ground. The very low rain fall is recorded on the Atacama Desert of the Chile where averages less than 1.5 cm. some years are even rainless. Inland Sahara also has rain less than 1.5 cm in a year. In American deserts is higher 28 cm. a year. Soils are coarse- textured, shallow, and rocky or gravel with good drainage and have no sub surface water. They are coarse because there is less chemical weathering. The finer and dust particles are blown elsewhere leaving heavier pieces behind. Canopy is most of deserts is very rare. Plants are mainly ground-hugging shrubs and shortly woody trees. Leaves are replete (fully supported with nutrients) with water conserving characteristics. Leave are small, thick and covered (with a thick cuticle) and leaves are also very much reduced to spines and photosynthesis is restricted to the stem. Some plants open their stomata only at night when evaporation rates are lowest plant include YUCCAS, OCOTILLO, TURPENTINE BUSHES, PRICKLY PEARS, FALSE MESQUILD, SOTOL, ETHEDRAS AGAVES and brittle bush. The animals include small nocturnal carnivores. The dominant animals are burrowers and kangaroo rat. There are also insects, arachnids, reptiles and birds. The animals stay inactive in protected hideaways during the hot day and come out to forage at dusk, dawn or at Night, when the desert is cooler.

(2.2). Cold-Deserts

These deserts are having cold winter with snowfall and high overall rainfall throughout the winter and occasionally over the summer. They are found in the Antarctic, Greenland and the Nearctic realm. Fairly long moist and moderately warm summer, winter temperature -2°C to 4°C and mean temperatures is between 21 to 26°C. The winter receive quite bit of snow. The heaviest rainfall of the spring is usually in April or May. In some areas rainfall can be heavy in autumn. The soil is heavy, silt and salty. It contains alluvial fans where soil is relatively porous and drainage is good so that most of the salt has been leached out. The plants are widely scattered. The main plants are deciduous, most having spiny leaves. Animals are kangaroo rats, kangaroo mice and antelope, Ground squirrels. Deer are only found in winter. The plants height is ranging from 15 cm to 122 cm.

(2.3). Costal-Deserts

They are found in cool to warm areas as Nearctic and Neotropical realm e.g. Atacama of Chile. Summer, average temperature are 13 to 24°C and winter is 5°C or below. Maximum annual temperature is about 35°C and minimum is about -4°C. Average rain fall is 8 to 13 cm. in many areas. The soil is fine- textured with a moderate salt content. It is fairly porous with good drainage. All the plants with thick and fleshy leaves or stem can take in large quantities of water when it is available and store it for future use. In some plants the surface are corrugated with longitudinal ridges and grooves. When water is available the stem swells so that the grooves are shallow and the ridges far apart. As the water is used stem shrink so that the grooves are deep and ridges close together. The plants are salt bush, buck wheat bush, black bush, rice grass, leaf horse bush, black sage and chrysothamnus. Some animals have specialized adaptations for dealing with the desert heat and lack of water. animals include mammals (coyote and badger), amphibian (Toads), birds, great horned owl and reptiles (lizard and snakes). Amphibians that pass through larval stages have accelerated life cycles which improves their chances of reaching maturity before the water evaporation.

(2.4). Semi-arid Deserts

These deserts include the Neartic realm (North America, Newfoundland, Greenland, Russia, Europe and Northern Asia) and the sage brush of Utah, Montana and Great Basin in America. The summers are moderately long and dry, summer temperatures range from 21 °C to 27°C not exceeds 38°C. Spiny nature plants are present .many plants are having silvery or glossy leaves. Plants are cat claw, white thorn, lyceums and jujube bur sage creosote bush and mesquite. The animals are kangaroo rats, rabbits and skunks, lizards, snakes, burrowing owls and the California thrasher and evening temperature around 10°C, the average rainfall ranges from 2 to 4 cm annually. The soil can range from sandy and fine – textured to lose rock fragments, gravel or sand. The spiny nature of many plants in Semi-arid Deserts provides protection in a hazardous environment. May plants have silvery or glossy leaves, allowing them to reflect more radiant energy? Semi-arid plants include: creosote bush, bur sage (*Franseria dumosa* or *F. deltoidea*), white thorn, cat claw, mesquite, brittle bushes (*Encelia farinose*), lyciums and jujube. Naturally many animals find protection in underground burrows where they are isolated from both heat and aridity. These animals include mammals such as the Kangaroo rats, rabbits and skunks insects like grasshoppers and ants; reptiles are lizards and snakes and birds as burrowing owls and the California thrasher. According to AUbreville (1949) who is considered the father of the term desertification was referred to as a human-induced process of degradation that transformed tropical forest to savanna and savanna into desert like region.

3. Some more prominent definitions

(3.1). Desertification is the notion that the extents of the deserts- dry areas with few plants-increasing, usually into semi-arid lands; (Warren and Agnew 1988).

(3.2). Desertification is the impoverishment of terrestrial ecosystems under the impact of people. It is the process of deterioration in these eco systems that can be measured by reduced productivity of desirable plants. Undesirable attention in the biomass and the diversity of the micro and macro fauna and flora, accelerated soil deterioration increased hazards for occupancy; (Dregne 1986).

(3.3). Desertification is the diminution or destruction of the biological potential of the land that can lead ultimately to desert like conditions. It is an aspect of the widespread deterioration of the ecosystems and has diminished or destroyed the biological potential I.e. the plant and animal products as for multiple use purposes at a time when increased productivity is needed to support growing population in quest of development (UN1977).Desertification is a process of sustained land (soil and vegetation) degradation in arid, semi-arid and sub humid areas, caused at least partly by people. It reduces both resilience and productive potential to an extent which can neither be readily reversed by removing the cause, nor easily reclaimed without substantial investment (Nelson, 1990).

(3.4). Desertification is land degradation in arid, semi arid and dry .Sub humid areas resulting from various factors, including climate variation and human activities (UN 1992). This working definition was agreed upon recently at the1992United Nations Conference on Environment and Development.

4. Conclusion

Following conclusion can be drawn for desertification.

1. It can be considered as a set of biological chemical and physical process which converges to create desert like conditions.
2. It is a social problem, involving people at all stages as course and as victims also one of lower agricultural return and increasing poverty.
3. Desertification takes place at the moment when land becomes irreversibly sterile in human time terms and with regard and to reasonable economic limitations.
4. Desertification is the diminution or the loss of the potential for sustainable use.
5. Problem in seed germination due to following characteristics:

- Loss of soil aggregation, key indicator for resilience of a dry ecosystem;
- Decrease of general topsoil infiltration capacity;
- Decrease of soil water storage;
- Loss of resistance against mechanical disturbance(Splash erosion)
- Surface redistribution and profile redistribution of water;
- New threshold of run- off initiation.

Causes of Desertification:-More than 75% problem of desertification is affected by uncontrollable climate events and population growth. Drought is also playing important role in land degradation by reducing water supplies in the affected areas. It is also related to manmade activities i.e., deforestation, cultivation, range land grazing and improperly use of irrigation technology which is responsible for land degradation and also increase of Salinization in the land. The removal of trees exposes the soil to the sun, wind and water and eventually to erosion by these elements. Deforestation for fuel, wood agriculture, pasture land and industrial uses goes on unbeaten even in the dry lands when vegetation is sparse, to meet an increasing demand for land and food, cultivation practices than can lead to desertification are land clearing practices such as slash and burn, cultivation of marginal land, cultivation of poor soil, reduced fallow periods and indiscriminate use of mechanized farming. Many social, economic and political factors are also responsible for encouragement of people to adopt destructive land use practices, such as population pressure, the stress of poverty, the stress of land ownership, the stress of the new global economic order and the stress of inequitable distribution of land resource.

5. Consequences

Loss of vegetation, wind and water erosion, loss and or impoverishment of land resources, reduced food production and productivity ,food insecurity ,loss of biodiversity including medicinal plants, element related disaster, including health hazards from dust particle movements, environmental refugee problem, loss of livelihood system, disruption and breakup of soil structure etc. Apparently more than 100 million tons dusts per annum is blown westward over the Atlantic from Africa. These dust come primarily from decertified land. Dust in shah lion air is a factor in causing billions of dollars of material and economic damage to the US and the Caribbean region, in addition to the social and human costs of livelihoods and lives.

For combat of desertification following solutions and Remedies are required.

- Transfer, share and disseminate such knowledge and required technology from north to south and vice-versa.
- Establish partnerships at the local level when the problem is most acutely felt through government, N. G. O., and communities etc.
- Of the obscure issues surrounding the phenomenon. Integrated programs are required that addresses the poverty, population growth, land ownership and political organization controls, trade and marketing arrangement-under lying driving forces or indirect causes-must be tackled to relieve the stress they impose in order to have long and permanent solutions.
- Develop a knowledge base through appropriate research to unravel some
- Pay special- attention to the economic environment. Both internationally and within nation.
- Physical, biological and socio-economic aspects of the process of desertification with in a National Action program.
- Adopt a bottom- up approach, to ensure that decision on the design and implementation of programs are taken with the participation of the population and local communities who best understand their environment.

- International cooperation is required to transfer knowledge and science and technology to save land degradation for international community.

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