



Review Pepper on Major Causes and Impacts of Land Degradation

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Abstract

Land degradation is the effect of different interaction among, physical, chemical, biological and socio-economic activities at global level. It affects country economy and also has much negative consequence on agricultural product by reducing the fertility of agricultural land. The global store of arable land and grazing land continuous to decline through unsustainable agriculture practices, urbanization and deforestation, while, significant portion of the remaining arable land and grazing land is under considerable pressure from compaction by livestock and farm implements, over use of fertilizers and pesticides, Salinization, alkalization or acidification depletion of nutrients, water and wind erosion, deterioration of drainage. The speed of land degradation is high due to, Poor managements of land, poor tillage operation on the land, and the prospective of the community about the consequences of land degradation on agricultural productivity, Lack of farmers understanding about the main biological, physical and mechanical methods of land conservation. The agricultural impacts of land degradation are, loss of soil nutrient, removal of soil, reduction of crop production, silting up of reservoir and It also contributes to persistent poverty, and results in decreasing ecosystem rehabilitation and provision of environmental services. Additionally, environmental decline due to land degradation also affects the health, well-being and livelihood opportunities of the individuals.

Keywords: Agricultural Impacts; Poor Managements; Urbanization

Abbreviations: IFPRI: International Food Policy Research Institute; UNCCD: United Nations Convention to Combat Desertification.

Introduction

As Olsson written Land degradation is outlined as a negative trend in land condition, caused by direct or indirect human-induced processes together with anthropo genetic temperature change, expressed as long reduction or loss of a minimum of one among the following: biological productivity, ecological integrity or price to humans [1]. This definition

applies to forest and non-forest land: forest degradation is land degradation that happens in forest land. Soil degradation refers to a set of land degradation processes that directly have an effect on soil [1]. As Ghebru, 2010 Says Land degradation is that the results of advanced interaction among, physical, chemical, biological, socio-economic and political problems with native, national or world nature whereas, the size of world method could also be Brobdingnagian, they'll be in state of dynamic equilibrium simply up set by human forces. Hurni, et al. [2] declared that Land degradation includes all method that diminishes the capability of natural resources to perform essential functions and services in ecosystems

[2]. The human structure and also the natural system area unit the 2 interlocking advanced systems and also the interactions between the 2 systems verify the success or failure of resource management [3]. Erosion by wind and water, comprising natural process, salinization, fertility depletion, decrease in ion retention capability, comprising crusting, compaction, hard-setting, reduction in total and biomass carbon, and decline in land diversity area unit major principal processes of land degradation [4]. It's never-ending method and has become, however, a vital concern poignant food security and also the wealth of countries, and has a sway on the living of just about all and sundry on this earth [5].

A number of the causes of land degradation area unit natural hazards, growth, growth of agriculture on the forests and marginal lands, poverty, land owner ships issues, political instability and mal administration in acceptable agricultural giant scale growth of irrigated agriculture [6]. As our country the main causes of land degradation in African country area unit speedy population increase, severe soil loss, deforestation, low vegetative cowl and unbalanced crop and stock production [7]. As general these days, the combined effects of human and natural factors accelerate the speed of world land degradation. Land degradation has become one among the best challenges facing humanity in today's world. Therefore, it's associate degree pressing task for accountable body to quickly grasp the standing of land degradation restore and reconstruct degraded land, defend resources of degraded land, develop and utilize degraded land, and strengthen land-degradation analysis.

Objectives

The Maine objectives of this review paper is to show that the core Cause of land degradation and its consequences.

Major Cause of Land Degradation

As Henry written, Land degradation is a critical problem in which the value of bio-physical environment is affected by a combination of human made process acting up on the land also environmental degradation is the step by step destruction or reduction of the quality and quantity of human activity, animal or natural means, Example: water cause, soil erosion, and wind, etc [8]. So this different cause's author's grouped land degradation as natural cause and human induced cause.

Natural cause of land degradation

Earth quack, High intensity of rain fall, types of soil, topography, volcanic eruption and steep relief are the major type of natural cause of land degradation [9]. Rain drop with highly amount of energy on bare land (unprotected soil) starts the process of erosion by water. Frequency,

Distribution and intensity of rain fall are the major factor affecting land degradation. Gentle rainfall distributed more evenly throughout the year causes less land degradation than heavy rainfall concentrated only to a few months [3]. Due to more frequency of rainfall cause more land degradation than that of less intensity [10].

Rainfall: Frequency, Distribution, intensity and timing of rain fall energy produced by rain fall are among major factors affecting the land degradation [11]. The impact of the land degradation dependent on those parameters when those factors are with higher degree, then impact of the degradation of land is also higher and the reverse is also true. Gentle rainfall distributed more over through the year explanation for few land degradation than heavy rainfall concentrated only few month rainfall evenly distributed over water shed [12]. High frequent rain fall causes high degradation the less frequent one.

Human Cause of Land Degradation

The human case land degradation includes production on fragile soils and steep slopes with inadequate investment in soil conservation or vegetation cover, declining use of fallow, limited recycling of dung and crop residues to the soil, limited application of external source of plant nutrient, deforestation and overgrazing [8]. The cause also includes proximate causes such as poverty, population pressure, high costs of and limited access to agricultural inputs and credits, low profitability of agricultural production, farmers' lack of information about alternative technology. Moreover, in order to sustain in subsistence economy, farmers are forced to mine soil and to cut down trees leading to land degradation [7].

Deforestation: Deforestation is the cutting or removal of tree from an area woody land or forest of tree an area woody land or forest for many reasons usually commercially or other purpose [9]. It is one of the major issues in this century since it is one of the many causes of expanding land degradation. Tree clearing is common occurrence which has taken place for centuries. Decades of year back in history some parts of our world continents which are suffering from conditions caused by land degradation [13].

Population growth: Population growth has been one of the frequent causes of land degradation [14]. There has been debate on relationship between growth rate, population number and agricultural development, particularly the intensity of farming system. As Shibru, 2010 written as the number of population increase, house hold construction, the required land for agriculture and other activities increase. This lead so miss management of land without knowing their degraded form [14]. The population of the world is increasing at an alarming rate. Land redistribution, which in

recent year has been the only means of normally acquiring access to land accommodate new households has lead to sever fragmentation of plots, reduction of crop yields and in security. Reduction of crop land per capital and in security have lead to the reduction in activities such as, fallowing, planting trees and investing in conservation structures. While a reduction in crop land per capital has caused cropping and grazing activities to be shifted to hill side and ecological damaged areas [15].

Farming System: It belongs to a type of farming practice that farmers are following without properly identifying the relationship between crop soils requirement and without following many soil and water conservation measures which are highly vital for conservation of land resource and compromising of future generation benefits [16]. The productive part of soil dirt is called top soil, if this eroded away through back ward farming system, then land is very unproductive in producing crops soil can be eroded away by wind and Water. Water erosion generally occurs on slopes and its severity increase with the severity of slope increases and High winds can blow away loose soil from flatter, hilly terrain.

Impacts of Land Degradation

Land degradation manifests itself in many various ways: vegetation becomes increasingly scarce, water courses dry up, thorny weeds predominate in once rich pastures, footpaths grow into gullies, and soils become thin and stony. All of those manifestations have potentially severe impacts on the environment, for land users and for people that rely for his or her living on the products from a healthy landscape [17].

Social and Economic Consequence of Land Degradation

Land and water degradation threaten food security for many of the poorest and most food insecure living in most countries like Asia, Africa and Latin America. And also contributes to persistent poverty, and leads to low ecosystem resilience and provision of environmental services [18]. Environmental decline due to land degradation adversely affects the health, well-being and livelihood opportunities of the individuals. Due to the presence of land degradation, Africa as a whole has become a net food importer since the mid-1980s. However, the economic implications of land degradation are particularly severe in Sub-Saharan Africa because 65% of the population is rural and the main livelihood of about 90% of the population is agriculture (Project Development Facility 2007). The most significant issue of world natural resource is erosion. Every year the countries are losing billions of dollars within the sort of soil, nutrient, water and agro biodiversity

losses [19]. As a result, poverty and food insecurity are concentrated in rural areas [20]. Land degradation is one among the main causes of low and in many places declining agricultural productivity and continuing food insecurity and rural poverty in the world (IFPRI 2005). As an example Ethiopian highlands are suffering from deforestation and degraded soils, which have eroded the resource base and aggravated the repeated food shortages caused by drought [21].

Ecological Consequence of Land Degradation

Land degradation has multiple and sophisticated impacts on the worldwide environment through a variety of direct and indirect processes affecting a good array of ecosystem functions and services [13]. The principal environmental impacts of land degradation include modifications of water flows, a rapid loss of habitat and biodiversity, and sedimentation of reservoirs and coastal zones (Project Development Facility, 2007). The resultant ecological impacts of land degradation in the world include loss within the chemical, physical and/or biological properties of soil which directly affects the sort of plant that are grown on the area, decrease availability of potable water, lessened volumes of surface water, depletion of aquifers due to lack of recharge, and biodiversity loss [17]. Similarly, Mulugeta [22] also explain that land degradation is threatening biological resources and agricultural productivity.

Agricultural Consequence of Land Degradation

Removal of Soil / Soil Erosion: Soil erosion is that the processes during which soil and rock are far away from the world surfers by exegetic process like wind or water flow ,ways of various physical, chemically and biologically process which include weathering with associated erosion. soil erosion from land area is wide spread and already adversely affected all natural and human managed ecosystem including agriculture and forest for that reason soil erosion ranks as one of the most serious environmental problem/challenge in the world, which is the effect of land degradation . It effects are pervasive and its damage are long tasting.

Removal of Soil Nutrient: When soil is eroded very essential plant nutrients such as; potassium, nitrogen, calcium and phosphorus also lost eroded soil typically contains about the three times more nutrient than the soil left behind on the eroded land [23]. A ton of fertile soil typically contains one up to 6 kilogram of nitrogen, 1-3kg of phosphorus and 2-30kg of potassium whereas the soil on frequently eroded land has nitrogen levels of only 0.1-0.5kg/t. Once the organic matter layer is depleted the productivity of the ecosystem as measured by crop Plant yield declines both because of the degraded soil structure and depletion of nutrients contained in organic matter [23].

Sampling No (farm plots)	Crops cultivated	Soil loss (Mg/ha)	Runoff (mm)	Cumulative Yield (Mg/ha)
1	Water melon	41	12	10.5
2	Pineapple	39	22	8.6
3	Yam	63	18	8.3
4	Vegetable	52	38	7.6
5	Water leaf	89	48	3.2

Table 1: shows effect of land degradation on soil fertility and its effect on yield, (a case study in calabar south Nigeria). As shown in the table above when the amount of soil loss increases the cumulative crop yield was decreases.

Decreasing Crop Production: By diminishing soil organic matter and over soil quality soil erosion reduce biomass productivity in ecosystem ultimately this a profound effect on the diversity of plant, animal, microbes and other forms of life present in ecosystem. Plants, animals and microbes as well as other form of life present in the ecosystem are a vital component of the soil as mentioned and constitute a large measure of the soil biomass. Indirect effect of erosion on ecosystem frequently may nearly as damaging as the direct effect of reducing plant productivity. For example; the steadiness and biodiversity of grass land where significantly reduced when plant species reduction occurred.

Recovery Methods of Land Degradation

Land degradation can be prevented through different techniques depending up on the nature and form of degradation. Most types of soil degradation can be prevented or reversed by reestablishing vegetation, or buffering soil acidity, adding nutrients to nutrient depleted soil, rebuilding topsoil through soil amendments [24]. However, few aspects of land degradation are less easily reversed than others. For example, total topsoil loss from erosion, terrain deformation by gully erosion, or the wiping out of native soil fauna is more irreversible than a negative nutrient balance, or surface sealing and crusting (Cox head and yard, 2008). In similar way, MoARD [24] illustrated that some types of land degradation are, for all practical purposes, irreversible. Examples are advanced salinization and severe gulling. Movement of soil material (erosion) is also irreversible, although its long-term effects on productive capacity depend on the depth and quality of soil remaining.

According to Cox head and yard (2008), the major environmental principles for reducing land degradation are to maximize vegetation cover to prevent erosion, replace nutrients removed, and to put in place structures (terraces, bunds, vegetation strips) so as to reduce the speed and volumes of water flow over the soil. From this perspective, tree crops, perennial crops, intercropping and reduced-tillage systems are recommended practices. Similarly, UNCCD (2004) revealed that tree cover and forests combat land

degradation and desertification by stabilizing soils, reducing water and wind erosion and maintaining nutrient cycling in soils [6]. Therefore, sustainable use of products and services from forest ecosystems and therefore the development of agro forestry systems can contribute to poverty reduction, making the agricultural poor less susceptible to the impacts of land degradation.

Conclusion

Generally land degradation is a common problem in the World; it puts disastrous impact on the socio-cultural environment and ecological setting of most country in the world. The major causes include rapid population increase, soil loss, deforestation, removal of vegetative cover and unbalanced crop and livestock production (overgrazing). Additionally, topography, soil types and agro-ecological parameters are contributing factors in the degradation processes influenced by man. To control or reduce land degradation, conservation measures throughout history are mainly focused on physical conservation structures which have less contribution for the addition of nutrients removed and to control or reduce soil erosion as compared to vegetation measures. However, as can be indicated in main text, land degradation can be prevented through different techniques depending on the nature and form of degradation.

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