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LAND RESOURCES AND APPLICABILITY FOR HUMAN BEINGS

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Abstract:

The paper is about land resources. Land is considered the greatest among the natural resources. Land carries the top soil which sustains an immense variety of living beings. Agriculture and animal husbandry are almost land based. The management strategy must involve the prevention of encroachment on forest land, on fertile agricultural lands for non-agricultural purposes. In a predominately agricultural country like India, land comes first. Due to exploding population, soil is used increasingly which poses threat to its productivity. It is the uppermost layer of the earth's surface which supports all forms of life. The main types of soil erosions are: (i) Normal or Natural erosion, (ii) Fluvial or water erosion, (iii) Aeolian or wind erosion, (iv) Accelerated soil erosion by human actions. In fact, too much soil erosion is one of the causes of eco-imbalance. It is the uppermost layer of the earth's surface which supports all forms of life. It is in the soil that all plants have their roots and from which they absorb life sustaining mixture and minerals. Desertification is a process in which the soil losses its productivity as a consequence of degradation or pervasive dryness. The process involves loss off regenerative capacity of soil due to extreme depletion or absence of plant supporting factors. In these regions as well as in other arid regions of the world, due to the high pressure on grazing lands and overexploitation of resources, degradation off environment is evident in the form of salinity hazard, seepage and water logging problems in irrigated areas off the desert.

Keywords: Land, erosion, resources, eco-imbalance, earth etc

Land is considered the greatest among the natural resources. Land carries the top soil which sustains an immense variety of living beings. Agriculture and animal husbandry are almost land based. Only a limited portion of the earth is suitable for practicing agriculture or for growing trees or for maintaining as pastures and grasslands. Therefore, land should be used in and prudent scientific manner to obtain maximum benefit. The land use pattern depends upon the suitability and ecological capabilities depending upon the geological and biological factors. The damage of the land usually results in an irreversible condition. This situation calls for an appropriate land use planning based on suitability and capability adjudged through determination of carrying capacity. The management strategy must involve the prevention of encroachment on forest land, on fertile agricultural lands for non-agricultural purposes.

Table: land use pattern in India

Land use pattern	Area in mha	percentage
Net sown area (agricultural land)	140.23	41.88
Area under forests (forest land)	74.84	22.35
Permanent pastures and grazing land	12.47	3.73
Miscellaneous tree-crop and grooves	3.96	1.18
Non-agricultural uses (settlements, industries, etc.)	17.53	5.24
Barren and unculturable land	21.94	6.55
Culturable wasteland	17.15	5.12
Current fallows and other fallows	23.99	7.17
Area for which no data is available	22.7	6.78
Total	334.80	100.00

Uses of Overexploitation of Land Resources

Unfortunately, land has been overused over the centuries. In a predominately agricultural country like India, land comes first. Due to exploding population, soil is used increasingly which poses threat to its productivity. Due to demographic pressures land is under stress due to sprawl in agriculture, industry and urbanization. Crop land is losing fast fertile top soil. Good agricultural lands in trans-Yamuna area, from Ghaziabad onwards are going to industrial estates and for urban development. Thus, valuable cropland is lost to agriculture forever. This is not in national interest. A strategy must be developed to cure post-damage and too save the country from future damage to land. This can be achieved by (i) preparing accurate land use data through remote sensing, (ii) a time-bound nationwide survey program of micro-level land use planning giving short and long term scenarios, (iii) preparing land use classes, (iv) reviewing all existing legislations and updating them and, (v) management plans for land amelioration. This would lead to a dynamic land-use policy.

Land Degradation and Its Conservation

More land is needed for agriculture and forestry due to increase in population. Moreover, good land is shrinking both in quality and quantity. The only way to raise land resources is by reclamation and developing degrading land or wastelands. Degraded or wastelands are those which for one reason or the other do not fulfill their life sustaining potential. Increasing misuse of land resources through shortsighted development policies has resulted into wasteland. About half off the land area of the country is lying as wasteland of varying intensity of degradation. This wasteland should be reclaimed and put to some productive use. Thus, the National Wasteland Development Board (NWDB) was established in 1985 to formulate action plans necessary to arrest land degradation and deforestation. Besides this, it also looks for regeneration of degraded forest areas and reclamation of ravines, usar lands, arid traits, mine spoils etc. the current mission of the NWDB is to check land degradation,



bring wasteland into sustainable use, increase biomass availability and restore ecological balance.

Soil and Its Formation

It is the uppermost layer of the earth's surface which supports all forms of life. It is in the soil that all plants have their roots and from which they absorb life sustaining mixture and minerals. Soil is formed as a result of long-term process of complex interactions between climate, topographic and biological factors. Bare rock surfaces are exposed to various types of physical, chemical and biological processes which lead to physical and chemical disruption, called weathering. Physical process of weathering include action of water, temperature, glaciers and gravity which cause weathering of rocks through such processes as wetting, drying, heating, cooling, freezing, solution and sand blaste, etc. The chemical process of weathering includes hydration, hydrolysis, oxidation, reduction, carbonation, etc. The loss of soil, either by natural process or by mismanagement, is harmful not only for agricultural development but to the whole eco system, therefore, its conservation has now become a matter of grave concern.

Soil Erosion

The main types of soil erosions are: (i) Normal or Natural erosion, (ii) Fluvial or water erosion, (iii) Aeolian or wind erosion, (iv) Accelerated soil erosion by human actions. Actually, normal soil erosion is a continues process but when it occurs on a large scale due to water and wind erosion, it not only degrades the environment but is also responsible for the expansion off wasteland due to gullies and ravines, as has been in case of Chambal region of central India. Soil erosion due to wind is a common phenomenon in arid and semiarid regions and is often a cause of desertification or desert expansion. The process of soil erosion is always accelerated by man either by overgrazing, faulty land use practices or by deforestation. The impact of soil erosion on the environment is both local as well as regional. The following are the general impacts:

- i. Formation of gullies and ravines and the whole region becomes an undulating area not suitable for human activities.
- ii. Washout of the upper layer off the soil, especially along hillside slopes.
- iii. Uprooting of –plants due to soil cutting, thus responsible for deforestation.
- iv. Loss off soil fertility
- v. Loss of pastures
- vi. Expansion of deserts, and
- vii. Increase in frequency of droughts and floods.

In fact, too much soil erosion is one of the causes of eco-imbalance. In India, the problem of soil erosion can be seen in Jammu and Kashmir, Himachal Pradesh, Uttar Pradesh, Bihar, Assam, and Arunachal Pradesh, Sikkim as well as in areas of Rajasthan and Madhya Pradesh. It has been estimated that in India about 53% of the area suffers from the problem of soil erosion.



Soil Conservation

It can be checked by adopting the following measures:

- i. Biological methods – strip cropping, crop rotation, application of manure, shelter belt and vegetation covers.
- ii. Mechanical methods – contouring, terracing, control of gully through retention of run-off, and new structure.
- iii. By maintain soil fertility through proper soil management system.

Important techniques of soil conservation

1. Contour Farming: Contour farming may be defined as ploughing, seeding, cultivating and harvesting across the slope
2. Strip cropping: On land with a decide slope, planting crops o contour strips will be an effective erosion deterrent.
3. Terracing: The modern terrace is an embankment of earth constructed across a slope in such a way as to control water run - off and minimize erosion.
4. Gully Reclamation: gullies are danger signals that indicate land is eroding rapidly and may become a wasteland. If a gully is small it may be ploughed in and then seeded to quick growing crop like barley, maize, jowar and wheat in order to check dams of manure and straws constructed at 5meters intervals which may be effective.
5. Shelter Belts: These are the ‘green belts’ of trees which help to break the force of strong winds and thus prevent or cut to a minimum thee blowing away off the loose top-soil.

Landslides

Landslides are another event which may cause disruption in the general ecosystem. Landslide is a natural hazard and is defined as *any downward movement of mass of regolith or bedrock under the influence of gravity*. It is a rapid sliding of large rock masses beginning their descent as unit of blocks, without internal flowage. In India, landslides often occur in hilly states like Jammu and Kashmir, Himachal Pradesh, Uttaranchal, and north-eastern states. These are common on hill and mountains where a piece of hilly mountain slides its way downwards eroding the soil on its way. The environment hazard of landslides is extremely high for towns located on the floors of glaciers troughs and at the heads of fiords. Various anthropogenic activities like hydroelectric projects, large dams, reservoirs, construction of roads and railway lines, construction of buildings, mining, deforestation, etc are responsible for inducing landslides in hilly areas. The blockage of roads by landslides is a common phenomenon but sometimes it also blocks the course of small rivers, thus, causing much damage. The main factors responsible for landslides are:

- i. Natural actors such as heavy and prolonged rainfall, wind, temperature, humidity, steep slopes, soil structure and texture organic matter content, earthquakes, etc.



- ii. Anthropogenic factors such as removal of vegetation of the slope, deep excavations on slopes for buildings, roads, canals and mining without proper disposal of debris and reinforcement of slopes, etc

Desertification

Desertification is a *process in which the soil loses its productivity as a consequence of degradation or pervasive dryness*. The process involves loss of regenerative capacity of soil due to extreme depletion or absence of plant supporting factors. Desertification is a complex process affecting more than six hundred million people and approximately one-third of the earth's land surface. It is a systematic phenomenon involving deterioration of the ecosystem due to change in the pressure of human adaptation or use system. It is a process through which fertile land is converted into infertile land. This involves interplay of climatic, edaphic and biotic factors which may work through time starting with a climatic accident and lead to accentuation of the arid conditions within an already desert terrain and creeping of the desert conditions towards its adjoining areas.

Desertification is one of the major global environmental and socio-economic problems that have attracted the attention of the environmentalists, planners, policy makers, politicians, common people and NGOs. In India, the arid zone covers about 12% of the country's geographical area and occupies over 32,000 sq km of hot desert located in parts of Rajasthan (62%), Gujarat (19%), Punjab and Haryana (9%), and Andhra Pradesh and Karnataka (10%).

In these regions as well as in other arid regions of the world, due to the high pressure on grazing lands and overexploitation of resources, degradation of environment is evident in the form of salinity hazard, seepage and water logging problems in irrigated areas of the desert. The increased pressure of livestock results in overexploitation of resources leading to soil erosion and removal of surface vegetation.

In order to control desertification the following steps to be taken:

- i. Ban on cutting of desert vegetation.
- ii. Plantation of ecologically suitable plants in affected areas.
- iii. Development of pastureland to release pressure from susceptible areas.
- iv. Control overgrazing in desertified areas.
- v. Stabilization of sand dunes.
- vi. Proper use of available ground water resources.
- vii. Management of land use and farming practices.
- viii. National watershed program should be intensified, and
- ix. Public awareness should be generated.

References:



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