

## Natural Resources Management

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### Abstract

The management of natural resources is an important area that individuals need to understand, irrespective of their background. This concept is applicable not only to the people residing in rural areas, but also the individuals residing in urban areas. Farmers and agricultural labourers directly depend upon the natural resources in order to secure their livelihoods. The crops grow in the soil, water is the resource due to which crops, plants and animals are able to survive and trees contribute in enhancing the living of the people. The topsoil contains the nutrients that crops need to grow efficiently, therefore, one of the most important techniques of natural resource management is to prevent soil erosion. The farmers whose main occupation is agriculture, primarily depend upon good soil and water conservation measures in order to yield a good harvest. There are individuals who take up occupations as fishermen, they depend upon the water bodies and pursue fishing. Individuals who primarily sustain their living by selling products from the trees, for them adequate forest management is a vital concern. There are farmers and agricultural labourers who reside in arid areas, hence, they depend upon the irrigation methods, to maintain longer growing seasons. In this research paper, natural resource management is considered to be a vital area, the main areas that have been taken into account are, significance of natural resource management, classification of natural resources, practices for natural resource management, and approach and ownership administration. The natural resource management strategies are mainly beneficial to the farmers, they are adequately able to sustain the livelihoods of themselves and their families.

**Keywords:** Natural Resources; Management; Practices; Administration; Ownership; Production

### Introduction

A natural resource is regarded to be any asset that one can acquire from the environment, i.e. water, soil, plants, wind, air, animals, birds, minerals, the energy of the sun and many others. Natural resources are often observed in terms of economic value, because so many of them are important for people's livelihoods. People are also an essential part that is unbreakably connected to the environment. Without water, air, soil, and minerals, the survival of the individuals would not have been possible. A difference is often made between renewable and non-renewable natural resources. Individuals who are employed in the agricultural sector, or those who are dependent upon the natural resources for their living such as tribal communities, for them it is important that natural resources should be adequately managed [1].

Renewable natural resources are considered to be the ones that can be regrown and whose supplies can be replenished through the natural processes. Some of the examples of renewable natural resources includes, plants, animals, insects, or wind. But being renewable does not mean that these resources will inevitably last forever. If the renewable resources in a particular area are overused for a long period of time, it is completely imaginable that they may become scarce or even disappear completely. A non-renewable natural resource is one that can be utilized, one that will not replace itself; examples of these include, oil, coal, minerals, or rocks. The utilization of these resources are required to be sensibly observed and managed in accordance to their obtainability. The effects that their use has on all the other resources and the environment as a whole should be judiciously monitored [1].

### Significance of natural resource management

In the management of natural resources, it is important that an individual should understand the utilization of land in an appropriate manner. The land is regarded as the multifaceted subject that is concerning many disciplines and serves as a means of meeting and earning one's requirements. The human interaction with the land is critically dependent upon whether the land is leasehold, freehold or a common property resource. The land use in India is categorized into forest areas, non-agricultural uses of land, barren and uncultivable land, cultural waste, permanent pastures, miscellaneous tree crops, fallow land, agricultural land and net area sown. Land serves as the storage of water and nutrients, that is required for different kinds of crops, the utilization of land requires demand for food, energy and human needs [2].

The natural resources should be effectually utilized in order to sustain the farm operations, by encouraging the proper use of the input, use of renewable energy and putting emphasis upon the quality of the soil. The conversion of agricultural land for non-agricultural purposes is also considered to be an important area in order to lead to holistic rural development. The balanced use of organic and inorganic fertilisers is vital for the direct influence on the fertility of the soil. In order to make proper use of the land available for various purposes, it is essential to study the requirements of the areas, land should be investigated and studied in detail in order to determine the constraints that prove to be impediments within the course of the improvement of water management and agricultural production. The maintenance of natural resources require efficient use of technologies, methods and procedures that would help in identifying the inconsistencies and problems that are associated with land use [2].

Many aspects of natural resource and environmental management changed across the regions, the main factors that led to changes are, increasing receiver and community involvement, emerging and distributing ecologically approachable technologies, nurturing environmental policies, and promoting rural finance to inspire off-farm income producing activities and micro-enterprise to assist in taking the pressure off natural resources. Other cross-cutting subjects include gender and indigenous knowledge. Though, the causes and effects of environmental degradation vary considerably across regions, countries and agro-ecological zones, creating a great diversity of natural resource management issues. Thus, one of the main tasks is to modify explanations to the requirements of each specific area [3].

### Classification of natural resources

The various categories of natural resources have been stated as follows [1].

**Water cycle:** Water is an essential need for all living beings, for people, plants and animals. The availability of the quantity of water and how one is able to make use of this water determines the productivity of the land. An important question in this case is, how many individuals, plants and animals it can support. Water is neither produced nor devastated. There is a fixed amount of water on the earth that flows in a cycle. The water cycle is a term used to describe the constant movement of water on, above, and below the surface of the earth. In the cycle, the water moves from the small creek that the farmer uses to irrigate its plot, to large rivers and oceans. The water also goes through different transformations including liquid i.e. in the form of rivers, solid, in the form of ice, and gas is in the form of vapor.

**Watersheds management:** A watershed is referred to an area from which all of the rainfall drains into the same place, i.e. stream, river or ocean. Watersheds can be large, covering thousands of hectares and many smaller water bodies, or even extremely small, just a few square meters that all drain into one gully or stream. Even very flat areas are part of a watershed. Irrespective of the size, a few basic management conceptions are used that are beneficial for all watersheds. It is important to make use of the management concepts, provided a person possesses adequate knowledge. The management of watersheds requires the observation of the upslope and downslope. It is vital to prevent soil erosion and employ adequate methods, strategies and techniques; the two main strategies are the utilization of physical interventions and the utilization of biological interventions.

**Soil composition:** Soil is regarded as the home of plants, providing them with water and proper nutrients; topsoil is full of nutrients and leads to efficient productivity. It also keeps plants firm and strong by fastening their roots. Soil is made up of different layers, but the most important for the growth of plants is the darker top layer, called topsoil. It clasps many of the essential nutrients that the plants need. It comprises of passageways for roots to cultivate, nurture and holds the water and air that roots utilize in order to continue. The deeper this topsoil layer goes the more crops can be generated. Deeper topsoil can hold more nutrients and retains water for a longer period during dry spells. But it is susceptible to wind and water which can rapidly wash or remove it.

**Trees and plants:** The growing of trees and plants have always proved to be beneficial and valuable to the individuals. The various kinds of fruits, flowers are provided by trees and plants. Plants require five things to grow, these are the, energy from the sun, water, air to breathe, nutrients from the soil, and a gas called carbon dioxide from the air. When a crop grows, it consumes nutrients from the soil. If the nutrients are not replaced, by adding of the organic matter or commercial fertilizer, then the soil becomes infertile and is not able to produce future crops. Every individual recognizes the significance of plants and trees, but in order to make them valuable resources, it is essential to make provision of water, manure and vital nutrients that are required for their growth.

**Biodiversity resources:** The small island states have a unique biological diversity. The Caribbean hosts 2.3 percent of the world's known endemic vascular plant species and 2.9 percent of the world's endemic vertebrate species, while inhabiting only 0.15 percent of the earth's surface. The rich flora of the Caribbean region is projected to contain 7000 endemic species. However, the modern range of invasive alien species are considered as a significant trans-boundary menace to the health of biodiversity and ecosystems. This has emerged as a major factor that has led to a decline of the species, extermination and loss of biodiversity goods and services [4].

**Forestry resources:** Forests harbour the enormous majority of terrestrial biodiversity in small island developing states. This biodiversity is categorized by high levels of endemism and the only way to preserve these endemic species is to preserve the environment. Forests are not only central resources for flora and fauna biodiversity but also they make provision of vital environmental services, such as, carbon storage, soil and water protection, tourism, etc. Island forests provide noteworthy livelihood opportunities for people residing within the rural areas. As these resources are frequently focussed on land with limited appropriateness for agriculture, forest based income is in majority of the cases, the only income for persons living in or close to the forest. The high significance of forests for local people also comes from the obtainability of freshwater, on the Caribbean islands, for example, most of the clean water is collected from surface water coming from the forests [4].

**Marine resources:** Small island developing states are accountable for a noteworthy section of the world's oceans but have restricted means to manage their marine resources. There are individuals who are residing near the marine resources and coastal areas, take up fishing as their occupation. Often fisheries are considered to be an important resource for the poverty stricken individuals, for those who are not able to obtain any other employment and or those utilized in crisis and difficult situations. However, these resources are often completely used or individuals practice this occupation, more than required, especially in coastal waters. Coastal areas are also severely impoverished by the unsuitable infrastructure development, inadequate waste water management and pollution; individuals throw waste materials into water bodies and cause their pollution. Coastal biodiversity is being reduced in many parts of small island developing states. Climate change means that this will undoubtedly remain to exist and rigorously intimidate the living conditions of the individuals [4].

#### Practices for natural resource management

The appropriate practices for farming and natural resource management have been stated as follows [1].

**Protection of the soil:** Soil is considered to be the most important resource that is required for the proper cultivation of the land. The growth of trees, plants, crops, farming methods and so forth, all require that the soil should be of good quality. It should be kept covered as much as possible, tilling and exposure of the soil to the weather conditions should be minimized. It is essential to build up the organic matter in the soil and whatever nutrients are used should be put back into the soil. It is essential to add fertilisers into the soil in the form of nutrients, the fertilisers may be organic or inorganic.

**Utilization of rainfall:** In some of the areas of the country, water shortage has been a problem for the individuals, and water is considered to be an imperative resource that is utilized for multiple purposes, such as washing, bathing, drinking, preparation of meals, cleaning of the houses and not only human beings, but also birds and animals require water. People in rural areas, who keep livestock, require water for their livestock as well. Therefore, water that is obtained through rainfall should be saved as much as possible. It is either saved in the soil through infiltration or in small

dams. It is vital to make use of the water carefully and it should not be wasted in any of the causes. It is important to save water for domestic uses as well as work purposes.

**Excessive water should not run off the slope:** This practice will prevent soil erosion, by making sure that excessive water does not get carried away by the topsoil. Various tools are required to get utilized in order to catch and channel excessive water down the slope; the various tools that are utilized are, contour, channels, canals and dams. One must not allow soil, water and other natural resources to get polluted and degraded. The pollution and degradation of natural resources would become an impediment within the course of generation of income and food for the people. Individuals will encounter problems in farming and agricultural techniques, therefore, it is important to protect the natural resources from pollution and degradation.

Maintain a Wide Diversity of Living Organisms – The trees and the plants which are not required or have dried, only they should be removed, otherwise more and more plantations of trees should be encouraged. Grass and weeds should be cleared from the areas, where it is necessary. Crop residues should not ever be destroyed. All living things are connected to each other and the maintenance of balance is the primary goal. The diversification of the farming system by making use of various kinds of crops, trees, animals and other sources of income is a vital area. This will make provision of stable production and valuable asset in times of ambiguity of unfortunate harvests.

#### Approach and ownership administration

The natural resource management approaches can be categorized in accordance to the kind and the right of the stake-holders natural resources [5].

**State property administration:** The ownership and control of the use of the natural resources is vested in the hands of the state. It is up to the state to look after the various means that are to be utilized in the management and administration of the natural resources. Individuals, families and groups of individuals are able to make use of the natural resources in order to meet their needs and requirements; but this is possible only at the permission of the state. Some of the examples are National Forests, National Parks and Military reservations. In these areas, individuals are able to access to the natural resources, as per the rules of the state.

**Private property administration:** Any kind of property that is owned by a particular individual or a corporate entity; in this case, the benefits and the job duties that a person is required to perform in order to preserve and maintain the resources is vested in the hands of the owners. Private land is the most common example in this case. In the case of ownership of land, whether it is utilized for construction, agriculture, farming and so forth, the owner is required to implement all the measures and the strategies and also utilize the produce for the sustenance of their livelihoods.

**Common property administration:** It is regarded to be the private property of the group. The group may vary in size, environment, nature and internal structure e.g. indigenous tribe, neighbours of the village, other communities etc. The common property is mainly regarded to be the property that all individuals and groups of individuals are able to make use of, the various examples are, grasslands, water resources and community forests.

**Non-property administration:** There is not any certain possessor of these properties. Each potential user has the equal ability to make use of this property in accordance to their aspirations and requirements. These areas are the most utilized, individuals make use of these areas in order to satisfy their needs. The most vital example is of lake fisheries; people depend upon the lakes and water bodies for fishing and other purposes.

**Hybrid administration:** Most of the ownership administrations that are governing the natural resources will contain parts of more than one of the administrations that have been described above. Therefore, the natural resources managers are required to possess the knowledge and information of hybrid administration.

#### Conclusion

For all the individuals, whether they reside in urban or rural areas, irrespective of the factors such as, religion, caste, creed, gender, levels of education, employment opportunities or socio-economic background, they should be aware of the existence of natural resources within the environment and how to adequately maintain them. The classification of natural resources are, water cycle, watersheds management, soil composition, trees and plants, biodiversity resources, forestry resources and marine resources. These are the resources that assist in the survival and wellbeing of the individuals. The preservation of natural resources is vital for the existence of the individuals who are employed in the agricul-

tural sector; water bodies are the ones that are imperative for not only animals and birds but also people.

The two main reasons due to which the management of natural resources is vital is, maintaining healthy ecosystems and building sustainable livelihoods. Living and non-living things are involved in interaction with each other and they co-exist in a balance. The exploitation of natural resources obstructs this balance, therefore, in order to live long and healthy lives, it is crucial to maintain this balance. Individuals who are engaged in occupations such as, farming, agriculture, fishing, or depend upon the forests to obtain fruits, vegetables and other items to sell them in order to make their living, rely on the entire ecosystem, which comprises of the water, soil, nutrients, plants, animals, and other things for their survival. How successful individuals are in their jobs, depend upon how they manage the natural resources.

The practices for natural resource management are, protection of the soil, utilization of rainfall, excessive water should not run off the slope and maintain a wide variety of living organisms. In the area of natural resource management, it is important to take into consideration, approach and ownership administration, the main aspects are, state property administration, private property administration, common property administration, non-property administration and hybrid administration. Finally, it can be stated that in order to support life, generate productivity, accumulate sources of income for the poverty stricken individuals and preservation of healthy farming environments, it is essential to manage the natural resources in a resourceful manner.

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