# Sustainable Conservation Practices for Natural Resources

Rajdeep Mundiyara[1], Prem Kumar[2] and Mamta Bajya[3]

[1]Seed Officer, Rajasthan State Seeds Corporation,Mandore, Jodhpure

[2] Department of Plant Philology, Jobner

**Email of corresponding author:** rmundiyara5@gmail.com

Land and water are the most precious natural resources, the importance of which in human civilization needs no elaboration. The total geographical area of our country is 329 mha. Due to urbanization, industrialization and burgeoning population, the per capita land availability is shrinking day by day. Only 2.5% of the total global water is fresh water and most of them are stored as snow, glacier and deep underground water and only 0.40% the fresh water is available in surface and atmosphere. Thus, there is an urgent need of judicious and rational use of natural resources so that it may be available to the future generations.

## Introduction:

Nature provides us the basic needs like food, shelter, clothes, etc. for our survival. We use air, water, soil, minerals, coal, petroleum, animals, plants etc. in our daily life. But do you ever think, how long these precious materials of the nature will be available for our use. The growing population, rapid industrialisation and urbanisation have created heavy demand on all these materials. It is feared that unless proper steps are taken to conserve them in time, we will face tremendous hardship in future.

A resource can be defined as ‘any natural or artificial substance, energy or organism, which is used by human being for its welfare’. Soil and water are the two major natural resources for the agriculture point of view. We have to protect these resources for the future generations of mankind.

## Conservation of Natural Resources

As the human population is continuously growing the consumption of natural resources is also increasing. With the increasing industrialisation and urbanisation of the modern human society, the use of all the resources is rising. If they are not properly used and well managed, a serious scarcity will result. Therefore we need to conserve the natural resources. This will also upset the ecological balance. Classification of natural resources are depicted in figure 1. Soil and water conservation measures are one of the essential inputs for increasing agricultural output in the country.

***Conservation is the proper management of a natural resource to prevent its exploitation, destruction or degradation.***

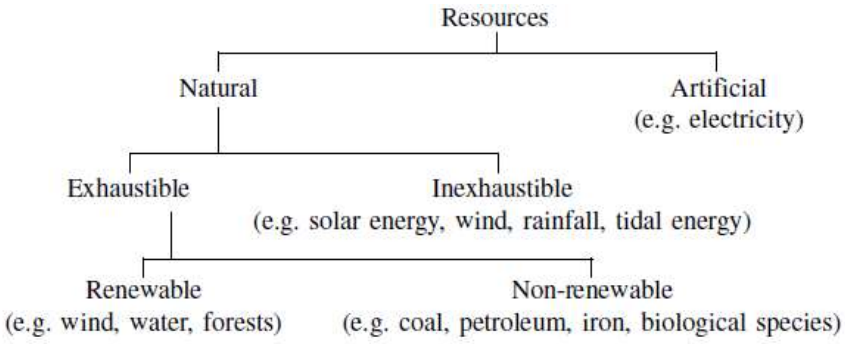


**Figure 1.** Classification of resources

## Need for Conservation of Natural Resources

We know that nature provides us all our basic needs but we tend to overexploit it. If we go on exploiting the nature, there will be no more resources available in future. There is an urgent need to conserve the nature. Some of the needs are:

- to maintain ecological balance for supporting life.
- to preserve different kinds of species (biodiversity).
- to make the resources available for present and future generation.
- to ensure the survival of human race.

## Conservation of Soil

The soil supports biomass production, whether it is natural vegetation or planted for agriculture and forestry. From the smallest seedling to the largest tree, all land-based vegetation depends on soil to provide them with nutrients, water and root support. In turn, this vegetation supports animal life on land. The productivity of soil is dependent upon its physical and chemical conditions as well as on climate. The most productive soils are usually used for arable farming and less productive soils support grassland and forests.

Soil conservation is a set of management strategies for prevention of soil being eroded from the Earth's surface or becoming chemically altered by overuse, acidification, salinization or other chemical soil contamination. The main aim of soil conservation is to prevent the loss of the precious top soil from erosion and to maintain it in a fertile state for agricultural purposes.

1. Preventing soil erosion: soil erosion can be prevented by
    i. Afforestation: Planting trees on a large scale is called afforestation. Roots of plants bind the soil thereby preventing soil erosion.

ii. Contour farming or terrace farming: In hilly areas, slopes are cut into steps for farming. This slows down the flow of water, preventing loss of the topsoil.
iii. Proper drainage and irrigation: In fields, proper drainage and irrigation arrangements help to prevent soil erosion.
iv. Preventing overgrazing: Preventing over grazing by herbivores helps to conserve soil.

2. Preserving soil fertility: Soil fertility can be preserved by following practices:
   i. Crop rotation: The practice of alternating a crop like rice and wheat with a leguminous plant is crop rotation. The root nodules of leguminous plants contain rhizobium bacteria which fix atmospheric nitrogen and enrich the soil.
   ii. Mixed cropping: The practice of growing two or more crops simultaneously in a field is called mixed cropping. This way, products or wastes of one crop can be utilised for the growth of the other.
   iii. Leaving field fallow: The practice of leaving the field free or uncultivated for some time after few growing seasons helps the soil to regain its fertility.
   iv. Application of manures and fertilizers: fertility of soil can be preserved by applying suitable manures and fertilizers.

**Conservation of Water**

Freshwater constitutes only 2.5% of the total water on the planet remaining 97.5 % water is the salty water in the oceans. Only 0.40% water of the fresh water is available on the surface and atmosphere. Densely populated and developing regions of the world, such as Asia and Africa are expected to face the maximum water stresses in future (Figure 2). Water can be conserve through

1. Using water economically and preventing wastage.
2. Preventing deforestation and promoting afforestation programmes in order to maintain the water cycle.
3. Treating sewage and industrial wastes in water treatment plants before releasing them into rivers and other water bodies.
4. Constructing dams and reservoirs to prevent flooding of low-lying areas.
5. Recycling agricultural and industrial wastes. This can be done by using wastes to form compost and gobar (dung) gas.
6. Rainwater harvesting which means, saving and conserving every drop of water which falls as rain and taking measures to keep that water clean.

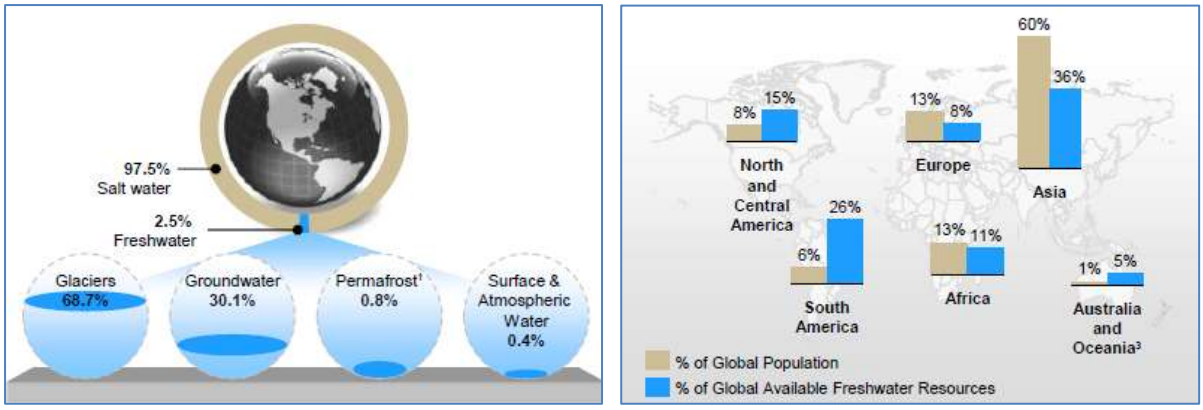


**Figure 2.** Global freshwater reserves and global population distribution
(Source: UNEP Annual Report 2002, UN World Water Development Report, 2003 and 2006)

Water Conservation and rainwater harvesting (Figure 3) is most effective when taken up as part of watershed management. The watershed being a hydrological unit, an intervention to store rainwater or moderate the runoff responds more favourably. Watershed management involves soil and water conservation efforts integrated with appropriate cropping pattern, proper agricultural practices combined with animal husbandry as a community effort to reap maximum economical gain.


**Figure 3.** Rainwater harvesting and its judicious use at individual level

Rainwater harvesting can be done in village level percolation ponds/ tanks, individual farm ponds. Check dams along the gullies, contour trenches, planting of grasses along contours, afforestation of waste, non/low productive land, raising horticultural crops etc. will increase percolation of water into the subsoil system, reduce surface runoff, increase time for water to remain on land, reduce soil erosion, recharge groundwater and improve water availability throughout the year. Judicious and rational use of water coupled with appropriate cropping pattern, equitable distribution of water and adoption of integrated agricultural practices (including animal husbandry) can turn drought areas into oasis.

**Conservation of Forests**

The maintenance and upkeep of forests is called forest conservation. The following steps must be undertaken to conserve forests:

1. **Afforestation-** Afforestation is the practice of renewing a forest by planting trees on a large scale. Forests can be conserved by striking a balance between planned cutting of trees (block-cutting) and afforestation.
2. **Block-cutting-** Block-cutting refers to cutting down of trees in a specified part of the forest while trees are planted in an adjacent area of the same size. This practice of deforestation and afforestation is carried out annually, because of which a sustained supply of timber or any other forest product is obtained every year without affecting the size of the forest.
3. **Preventing overgrazing-** Overgrazing by cattle, horses and sheep must be prevented. Herbivores not only destroy grasslands but also eat up the lower branches of trees.
4. **Protection from diseases and pests-** Serious diseases of forest trees like rust, smut, wilt and mosaic are caused by microbes like fungi, bacteria and viruses. In addition, many insects and pests damage forest trees. Diseases and pests can be controlled by removing infected trees, spraying pesticides and growing disease and pest-resistant varieties of forest trees.
5. **Preventing forest fires-** Man-made forest fires are believed to have caused extinction of several species in the past. Callousness of local people may cause irreparable damage to forests. People must refrain from lighting bonfire of even lighting a match in forests.