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Natural Resources Management for Socio Economic Development in India

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Abstract

The present study enlightened the crucial role of natural resources for socio economic development in any country. The study revealed that the natural resources are real wealth and natural capital of the nation, which helps to increase fiscal revenue, income, generate employment, reduce poverty and helps to maintain the environmental stability. Deficient use of natural resources may cause of backwardness of any country. Authors elaborated the present status of soil and water available in India for enhancing the productivity and environmental balance in the country. The study further explored that, in India, ample quantity of natural resources are available, but they are being rapidly depleted due to overexploitation. Preserving, protecting, appropriate management and rational utilization of the scarce agricultural land and water resources is so crucial for the future of agriculture and environmental equilibrium. The study concluded that there is a need to use natural resources sustainably to keep our planet and species healthy over the long term since these natural resources helps to conserve biodiversity and protect the environmental ecosystem.

Keywords: Biodiversity; Ecosystem; Environment; Natural resources; Socio-economic

Introduction

Natural resources are the resources that are available in nature for all types of lives at free of cost. Perhaps, land, water, air, forest, sunlight, minerals, gases, oils etc. are used mainly by human being for sustain life and welfare of the people. Natural resources are real wealth and natural capital of the nation, which helps to increase fiscal revenue, income, generate employment, reduce poverty and helps to maintain the environmental stability. Natural resource-related industries provide occupations to rural communities. Rational allocation and sustainable use of natural resources are the critical challenges for socio economic development of country. A country lacking in natural resources may be unable to develop rapidly and abuse or underutilization or overexploitation of natural resources may cause of backwardness of any country. In India, ample quantity of natural resources is available and rural economy significantly depends on it. But they are being rapidly depleted due to overexploitation.

Literature Review

Role of natural resources (soil and water) in agriculture production system

In agriculture production system, natural resources such as plants, animals, land, water, energy, air and number of other natural resources are played an important role for growing crops. Land, the major input of agricultural activities is shrinking day by day due to over-cultivation, deforestation, soil erosion, increase in livestock grazing, urbanization and harsh climatic conditions [1]. This is the big challenge for increasing the agricultural productivity to feed livestock population and to food for increasing human population by appropriate management and rational utilization of scarce land resources. As per the latest data from Niti Aayog, the gross sown area was 141 million hectares, and agriculture production is depending on this quantity of land. The quality of land is also important for agriculture production because, poor quality or nutritional deficit or too much aridity in land will not get good yields. Soil erosion is also an essential concern. In every year, about 5.3 billion tonnes of soils (@16.4 tonne/hectare) are eroding in India and declining the quality of soils. That's why, preserving, protecting, appropriate management and rational utilization of the scarce agricultural land resources is so crucial for the future of agriculture and environmental equilibrium.

Water is another major input in food production system. India has a total water surface area of 314,070 km^2. Increasing demand of water and insufficient water availability alarming to the livelihood of people, animal husbandry and agricultural and fisheries activities across India. Water pollution and wastage of water is the serious concern in all over the world. Waste and polluted water is generally produced by household activities, industrial use and other production and consumption related activities [2]. Direct use of such polluted water may impact on environmental deprivation and health hazards also harm to aquatic animals, wildlife and depletion of oxygen [3]. In India, major part of cultivated area (39 million ha) is irrigated by ground water followed by canals (22 million ha) and about two third of agriculture is depends on monsoon [4]. Over the period of time, imbalanced fertilizers used for enhancement of agricultural productivity, it's led to such issues like declined the water table and water quality and it lead to overall degradation of soil health. Therefore, preserving, protecting, appropriate management and rational utilization of the scarce water resources is so crucial for the future of agricultural and environmental equilibrium.

Present status of soil and water resources in India

As the backbone of Indian economy, agriculture sector contributes to around 16.5% of India's GDP. As of 2022, the Indian agriculture market value stood at USD 435.9 billion and is expected to reach USD 580.82 billion by 2028, growing at a CAGR of around 4.9% between 2023 and 2028 [5]. The average land holding of a small farmer in India is small (1-2 hectares), semi-medium (2-4 hectares) and medium (4-10 hectares). As per the latest data, the cultivated land in the country is 1,53,888 thousand hectares against the total agricultural

land (1,80,888 thousand ha). Out of total available agricultural land, only 40 percent land is irrigated and about 51.09% of the land is under cultivation, 21.81% under forest, 3.92% under pasture and 12.34% land is not available for cultivation (India water portal, 2009). The report of land use statistics stated that the cultivable land in the country has reduced to 18.09 crore hectare in 2018-19 from 18.18 crore hectare in 2013-14 [6]. Per capita availability of land in India is only 0.0021 sq. km.

Land degradation is also a big problem in India. The report of the energy and resources institute titled 'Economics of desertification, land degradation and drought in India' indicated that owing to the loss of productive land for various ecosystems, a degradation of existing ecosystems is the larger concern. The annual economic costs of land degradation and land use change in the country have been estimated at Rs. 3,17,739 crores, which is 2.54 percent of India's GDP in 2014-15 and about 15.9 percent of the GVA from agriculture, forestry and fisheries sectors [7]. Almost 82 percent cost of land degradation is estimated and only 18 percent cost estimated for land use changes. The area that is expected to be ruined by 2030 under land degradation and land use changes were projected at 94.53 mha and 106.15 mha respectively by TERI.

The major waterbodies and sources of water are sea water, ground water, surface water and rainfall. Nearly 97% of earth's water is available in seas. Due to high content of salt, this water is not suitable for human consumption or other uses. About 2.3% of water is sheltered in glaciers and only 0.7% is available as fresh water. According to the international norms, the country is considered as water stressed country if per year per-capita water availability is less than 1700 m^3. Subsequently, the water availability per capita per year is less than 1000 m^3, the country is considered as water scarce country. Rivers are the major sources (more than 50%) of water in India and it comprises over 20 major rivers with number of tributaries. Indian River's average annual flow per year estimated as 1953 billion cubic meters. Nearly 432 billion cubic meter water in replenish-able ground water. Surface and ground water resources utilization in India are estimated as 690 and 396 billion cubic meters per year, respectively [8]. Hence, it was assessed that the total utilizable water resources in the country are 1086 billion cubic meters.

The rainfall in India shows very high chronological variability and paradox of the situation is that Mowsinram and Cherrapunji villages in Meghalaya state receives highest rainfall (11,690 mm) in the world but it suffers with shortage of water during non-rainy period. Normal duration of monsoon in India is about 100 to 120 days starts from first June. Places like Jaisalmer, in the west, which receives hardly 150 mm of rain. 21 percent area of the country receives less than 750 mm of rain annually while 15 percent rainfall is receiving in excess of 1500 mm. Large areas of peninsular India receive rainfall less than 600 mm. Annual rainfall of less than 500 mm is experienced in western Rajasthan and adjoining parts of Gujarat, Haryana, Punjab, Deccan plateau and east part of Sahyadri. Rest of the country receives moderate rainfall. Many times the intensity of rainfall creates serious floods situation. The annual rainfall in India, however, fluctuates widely [9].

To increase agricultural production and productivity in India, in five year plans, development of irrigation infrastructures was prioritized and multipurpose river valleys projects like Indira Gandhi Canal Project Nagarjuna Sagar, Bhakra Nangal, Hirakund, Damodar Valley, etc. has been carried out. Even today, to fulfil the irrigational needs, India's water demand is conquered by agriculture sector. This sector is accounts for 89% of the surface and 92% of the ground water utilization. Although the water demand for industrial sector is limited to 2 percent of surface water and 5 percent of ground water utilization. The share of domestic sector is higher (nearly 9%) in surface water as compare to groundwater utilization [10-14]. Still, by means of developmental activities, the shares of domestic and industrial sectors in the country, the water demand likely to be increased in future. In spite of availability of sustainable quantity of water in India, the actual utilizable quantity is limited and a freshwater crisis is gradually recounting in India. Because of poor water planning and environmental degradation, the water crisis and lack of accessibility to safe water to millions of people is concerned.

Causes of soil and water degradation in India

Factors affecting land availability for agricultural purposes are land tenure system, population growth, soil type, topography, the size of useful land, climatic factors, cultivation practices, govt [15]. policies, religious belief and environmental degradation are the foremost influences for availability of land for agricultural activities. Population growth, soil pollution, land use land cover change, deforestation, over exploitation of other natural resources, urbanization and industrialization are the leading concerns to soil and water degradation. For enhance the agricultural productivity in country, over a long period, use of chemical fertilizers, over irrigation, overgrazing and poor farming practices etc. Accomplished by the farmers. It resulted such issues like degradation of soil health; decline the water table, water pollution and deficiency of micronutrients in soils.

Discussion

Government efforts to conserve soil and water resources in country

Various schemes and programmes have been intervened by government for soil and water conservation. For providing information to farmers about the soil health, nutrient content, fertilizer need, crop suitability etc. the Soil Health Card Scheme (SHCS) has been launched. Soil Health Management (SHM) scheme is furthermost intervention for setting up Soil Testing Laboratories (STL) and Fertilizer Quality Control Laboratories (FQCLs) under National Mission for Sustainable Agriculture (NMSA). Integration of Land and Water Schemes to tackle land degradation issues. Integrated Watershed Management Programme (IWMP), National Afforestation Programme (NAP), National Mission for Green India (GIM), Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), Soil Conservation in the Catchment of River Valley Project, National Watershed Development Project for Rainfed Areas (NWDPRA), Command Area Development and Water Management (CADWM) programme, Rashtriya Krishi Vikas Yojna (RKVY), Atal Bhujal Yojana, Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), Har Khet Ko Pani etc. are the major schemes and programmes successfully implemented by the government for soil and water conservation, productivity enhancement and socioeconomic upliftment of farming community in the country.

Besides, Jal Shakti Abhiyan-catch the rain, Sahi Fasal campaign, Mission Amrit Sarovar and awareness generation and training campaigns etc. has been organised time to time by government to address the issues related to soil and water conservation. The National Afforestation Programme and Green India Mission, National Coastal Management Programme, National Mission on Himalayan Studies under Climate Change Programme, National River Conservation

Programme and sub-schemes of conservation of natural resources and ecosystems etc. has been executed to up gradation of ecosystem services, for livelihood generation at community level, for locally available land and water resources making healthier and productive and for providing a better future for inhabitants in the country, government has been taken good steps time to time. However, the sufficient budgetary provisions are also available to solve the problem and implementation of all land and water related schemes in Centre and States, yet there is a need to bring convergence to utilise these resources better.

Conclusions

Natural resources, soil and water play an important role in sustaining our life. We are depending on them for food, clothing, shelter, fuel, and other needs. It is our responsibility to use them properly because they are limited and can be depleted if abused. There are several reasons why we should use natural resources in a sustainable manner. It ensures that these resources will be available for our future generations. If we use them in an unsustainable manner, our children will be left with a spoiled and depleted sphere. It can help to conserve biodiversity and protect the environmental ecosystem. We will eventually deplete all natural resources if we do not use them sustainably. Using natural resources sustainably can create employment, uplift our socioeconomic conditions and boost the economy of the country. Therefore, we need to use natural resources sustainably to keep our planet and species healthy over the long term. We are responsible for actively conserving natural resources so that the next generation can enjoy the same benefits as we do today.

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