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BASIC PROBLEMS OF FOREST SECTOR AND MANAGEMENT PRACTICES IN SUSTAINABLE AGRICULTURE DEVELOPMENT IN INDIA

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ABSTRACT

This paper evaluates the effect of deforestation and climate change the management practices on sustainable agriculture development in India (described in terms of the deforestation and rainfall/agriculture production) on forest cover and vegetation in India. In this study is used to evaluate their relationship between the forest area ratio and production of agriculture. India, the seventh largest country, covers about 2.4 percent of total global land about 1 percent forest area and about 0.5 percent pasture land of the world, but supports about 17.5 percent of human and about 15 percent of cattle population, 1.2 percent of wealth of the world, and this population is always in the process of increase. India is one of the 12-mega diversity countries commanding 7 percent of world biodiversity and supports 16 major forest types. But nearly half of the country's area is degraded, affected with the problems of soil degradation and erosion. India has agriculture dominant economy, about 43 percent of land is under agriculture but the productivity is far below in comparison with developed countries because only one third of cultivated areas in the country are under irrigation. About 23 percent of land area is forest lands having productivity less than one cubic metre per hectare per year against the potential of eight to ten cubic metres per hectare per year. The present low productivity is due to growing biotic pressure and inadequate resources for scientific forest management. Nearly 4.6 percent area, are cultivable waste and 7.1 percent fallow land available for tree planting and pasture development, more than half (about 53 percent) of country's lands are under various types of land degradation. About 146 million ha area is affected with wind and water erosion and 7 million Ha, has become degraded due to excessive salts. 8.5 million Ha, is under water logging and about 10 million ha is affected with shifting cultivation. Nearly 23 percent (76 million Ha.) of country's land has been recorded as forests but only 19.5 percent (64 million Ha.) of total area has forest or tree cover which is much less to the goal of 33 percent set by the National Forest Policy, 1988. About 65 percent of forest cover has dense forest with crown density more than 40 percent and rest 35 percent are badly degraded. The crown density of dense forests is continuously depleting due to overuse of forest resources by the people and their cattle living in and around the forests, those have been depending on forest from the past. Between 1880 and 2013, India lost about 40 percent of its forest cover. Present, 24 percent of its area is under forests or 7 lakh sq km, according to government data. The area under forest and tree cover has grown by 5,081 sq km between 2013 and 2015 in India.

KEYWORDS

problems of forest sector, agriculture development in India.

INTRODUCTION

Dou have to decide whether development means affluence or whether development means peace, prosperity and happiness.

- Sunderlal Bahuguna

Forests are the world's air-conditioning system the lungs of the planet. Forests occupy an important place among the natural resources of a country. However, forests are neither abundant nor very rich in their products. In India presently forests occupy an area of about 6.96 crore hectares which is 22.8 percent of the total reporting area. The national forests policy resolution of the Government of India 1952 had recommended that the country should aim at maintain one – third of total geographical area under forests. Since 1950-51 due to increase population and consequent upon heavy pressure on forestland about 47 lakhs hectares of forest has been lost to agriculture river valley projects, industrial estates, and other uses. However, since the enactment of the forest (conservation) Act, 1980 the rate of diversion has been brought down to about 16,500 hectares per year, as against 1.5 lakh hectares during the period 1950-51 to 1979-80. The northwestern part of the country barely 11 percent of the area is under forests. In contrast, in the central region about 44 percent land is covered with forests. The Himalayas and the tarai regions contain about 20 percent of the forests while over 75 percent of the forests are located in the peninsular India. The genetic plain has even less than 5 percent of the forests. More over the productivity of our forests is only 1.34 cubic meters per hectares per year against the world average of 2.1 percent cubic meters per hectares per year. While 78 percent of the forest area is subject to heavy grazing and other unregulated uses, adversely affecting productivity and regeneration, nearly 10 million hectares of forests area is subjected to shifting cultivation. Between 1880 and 2013, India lost about 40 percent of its forest cover. Today, 24 percent of its area is under forests or 7-lakh sq km, according to government data. The area under forest and tree cover has grown by 5,081 sq km between 2013 and 2015. India is a large developing country known for its diverse forest ecosystems and mega biodiversity. It ranks 10th amongst the most forested nations of the world with 23.4 percent (76.87 million ha) of its geographical area under forest and tree cover (FSI, 2008). With nearly 173,000 villages classified as forest fringe villages, there is obviously a large dependence of communities on forest resources. Thus, it is very important to assess the likely impacts of projected climate change on forests, to develop and implement adaptation strategies both for biodiversity conservation and protection and for safeguarding the livelihoods of forest dependent people, and to ensure production of round wood for industrial and commercial needs.

Forests provide a wide range of goods and services. Goods include timber, fuel wood, as well as food products (berries, mushrooms, etc.) and fodder. As regards important services, forests and trees play a role in the conservation of ecosystems, in maintaining quality of water, and in preventing or reducing the severity of floods, avalanches, erosion, and drought. Forests provide a wide range of economic and social benefits, such as employment, forest products, and protection of sites of cultural value. Forests, like other ecosystems, are affected by climate change. The impacts due to climate change may be negative in some areas, and positive in others. However, forests also influence climate and the climate change process rainfall, agriculture crop, mainly by effecting the changes in the quantum of carbon dioxide in the atmosphere. They absorb CO₂ from atmosphere, and store carbon in wood, leaves, litter, roots and soil by acting as carbon sinks. Carbon is released back into the atmosphere when forests are cleared or burned. Forests by acting as sinks are considered to moderate the global climate. Annual addition of 6 mt of biomass due to operationalization of the Mission will increase the annual emissions removal capability of the forests from 4.87 percent to 5.18 percent of the corresponding projected emissions in 2020. Even if half (3 mt) of the annual biomass increment (6 mt) is removed annually on a sustainable basis from 2025 onwards, the emission removal capability of forestry sector would still be able to offset every year 5.02 percent of the 2020 level emissions.

BACKGROUND OF THE STUDY

The forest sector sustains the livelihoods of millions of smallholders families and is at the centre of national policies to alleviate rural poverty. However, this need for land agriculture is also the main driver of deforestation and land degradation. A major challenge is how to encourage pro-poor agriculture development while mitigating deforestation and associated greenhouse gas emissions. There continues to be a lack of depth of understanding of the relationship between the forest and agriculture sectors, which can and has led to erroneous or partial solutions. Both Goals 14 and 15 of the proposed Sustainable Development Goals (SDGs) contain within them a hint at a strategy that India is familiar with, for conserving biodiversity. Simply put, this is a strategy that is pursued through the creation, expansion and consolidation of a protected areas network that has resulted in remarkable achievements of conserving species as well as ecosystems in India. Although the protected areas network is a remarkable achievement for a poor country like India that has many other competing and urgent priorities, additional

efforts need to be made to expand the network in order to conform to not only SDGs but also terms agreed upon under the convention on biological diversity. Don't let them wild life be a history, pollution if you don't kill it, it will kill you and take care of the trees, and they will take care of you.

OBJECTIVES OF THE STUDY

1. To study the impact of deforestation on the agriculture production in India. And the basic problems of the forest and the management practices of sustainable agriculture sector in India.
2. To analyze the relationship between the forests and sustainable agriculture development in India, to assess the level of agricultural development.
3. To discuss the need and importance of the sustainable agriculture development in India, and its impact.
4. To suggest improve the forests and development of sustainable agriculture sector in India.

METHODOLOGY OF THE STUDY

The present study is based on the secondary data, which data collected from various books, journals, magazines, publications, articles, newspapers, government web sites, etc. This study focused on the basic problems of forest sector and management practices in sustainable agriculture development in India. And what about the importance of forest area ratio and relationship between the forest area ratio and agriculture production.

SCOPE OF THE STUDY

The study is concentrated on the relationship between forests and sustainable development of agriculture sector in India with a interlink between the forest area ratio – rainfall – balanced climate - agriculture production in India. Every part of the world is green, if every heart of human is green.

LIMITATION OF THE STUDY

This study must be interpreted as a foundational exercise in the forests area in India and sustainable agriculture development in India through the forest area. The estimates provided are conservative and minimalist, it is hoped that further studies will build on the methodologies presented here to provide more precise estimates. The study does not account for all possible development pathways that India can choose. India may explore alternative strategies in different sectors like agriculture, industries and services, in accordance to the need, availability, resources, expertise, and political will of the Indian Government. This may impact on the agriculture production in India. It is hoped that further research will provide these crucial analyses.

NEED FOR SUSTAINABLE AGRICULTURE IN INDIA

The management practices for sustainable agriculture virtually differ from those of modern agriculture. The important steps to sustainable agriculture are conservation of crop diversity, conservation of tillage, watershed management, efficient water management, integrated nutrition management, integrated weed management, integrated pest management, and crop diversification. Generally the management practices in sustainable agriculture are aimed at achieving sustainable production with limited or no chemical inputs with priority to farm grown inputs without pollution and minimum damage to natural resources, including soil, wildlife, forests, crops, fish, livestock, plant, genetic resources and ecosystems without degradation and to provide food, livelihood for current and future generation maintaining and improving productivity and ecosystem services. The Brundtland Commission (World Commission on Environment and Development,-1987) defined sustainable development as Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Arrow, Dasgupta, Goulder, Mumford and Oleson 2010 take the view that economic development should be evaluated in terms of its contribution to inter-generational well being. They show that intergenerational well-being would not decline over a specified time-period if and only if a comprehensive measure of the economy's wealth were not to decline over the same period. The three dimensions of sustainable development socio-economic and environmental. Economic efficiency is necessary for achieving the maximum possible growth with limited resources. The social dimension is in terms of equity, particularly intra generational equity. Poverty eradication is one of the Millennium Development Goals (MDGs) it has become a global public good by global public choice. The environmental dimension captures internalization of environmental costs of pollution and natural resource degradation in decision making of all economic agents and intra generational equity. It is being realized that natural resource degradation and pollution are not just environmental challenges they threaten poverty eradication and achievement of the MDGs, traditional production systems, conventional modern agriculture and sustainable agriculture. We can compare them across three dimensions: ecological, economic and social. Ecological sustainability many traditional and most conventional farm practices are not ecologically sustainable: they overuse natural resources, reducing soil fertility, causing soil erosion, and contributing to global climatic change. Sustainable agriculture has several major advantages over both traditional and conventional practices, soil fertility and water, a continuous fall in soil fertility is a major problem in many parts of India. Sustainable agriculture improves fertility and soil structure and prevents erosion, so would be an answer to this problem. Irrigation is the biggest consumer of fresh water, and fertilizer and pesticides contaminate both surface and groundwater. Sustainable agriculture increases the organic matter content of the topsoil, so raising its ability to retain and store water that falls as rain.

Biodiversity and pollution sustainable agricultural practices frequently involve mixed cropping, so increasing the diversity of crops produced and raising the diversity of insects and other animals and plants in and around fields. Pesticides are hazardous to human health as well as to the local ecology. Incorrect handling, storage and use of pesticides lead to health and pollution problems. Sustainable agriculture reduces or eliminates the use of hazardous chemicals; instead, it controls pests with a variety of biological and agronomic measures and the use of natural substances. Conventional agriculture contributes to the production of greenhouse gases in various ways by reducing the amount of carbon stored in the soil and in vegetation, through the production of methane in irrigated fields, and through energy-intensive activities such as the production of artificial fertilizers. Adopting sustainable agriculture would reduce these impacts significantly. Agriculture and forestry clothe the rural landscape, inappropriate use causes erosion, landslides and flooding, clogs irrigation channels, and reduces the ability of the land to support the local population. Impoverished rural people flock into the cities in search of jobs, forming unsightly, insanitary slums that further destroy the landscape. Sustainable agriculture avoids these problems by improving productivity, conserving the soil, avoiding the expansion of farming into unsuitable areas, and preserving rural jobs. Economic sustainability agriculture cannot be sustainable unless it is economically viable over the long term; conventional agriculture poses greater long-term economic risks than sustainable alternatives. Employment farming is the main source of employment for rural people, trends towards specialization and mechanization may increase narrowly measured efficiency, but they reduce employment on the land. The welfare costs of unemployment must be taken into account when designing national agricultural support programmes. Sustainable agriculture, with its emphasis on small-scale, labour-intensive activities, helps overcome these problems. Government tends to view export-oriented production systems as more important than those that supply domestic demands. Focusing on exports alone involves hidden costs in transport, in assuring local food security, etc. Policies should treat domestic demand and in particular food security (either by farmers producing food for themselves, or by selling produce for cash they can use to buy food) as equally important to the visible trade balance. Niche markets organic agriculture is one of the strongest ways to farm in an environmentally sustainable way. Social sustainability the social sustainability of farming techniques is related to the ideas of social acceptability and justice. Food security traditional farming techniques often fail to produce enough food, or enough variety of food for a balanced diet. Sustainable agriculture improves food security by improving the quality and nutritional value of the food, and by producing a bigger range of produce throughout the year. Sustainable agricultural practices usually are based on local social customs, traditions, norms and taboos, so local people are more likely to accept them and adapt them to their own needs.

TABLE 1: THE TOTAL POPULATION TOTAL FORESTS AREA NET RAIN FED AREA NET IRRIGATED AREA TOTAL AGRICULTURE PRODUCTION (FOOD GRAINS) IN INDIA FROM 1950 - 51 TO 2010 - 11

Year	Total Population (in crores)	Total Forests Area (in million hectares)	Net Rain fed Area (in million hectares)	Net Irrigated Area (in million hectares)	Total food grains (in million tonnes)
1950-51	36.11	40.48	97.90	20.85	50.8
1960-51	43.92	54.05	108.54	24.66	82.0
1970-71	54.82	63.91	109.17	31.10	108.4
1980-81	68.33	67.47	101.28	38.72	129.6
1990-91	84.64	67.87	95.22	47.78	176.4
2000-01	102.87	69.49	86.40	54.68	196.8
2010-11	121.02	69.80	85.70	63.20	257.0

Source: Compendium of Environmental Statistics – 2011.

The total population in India is 36.11 crores in 1951 it is increased to 121.02 crores in 2011. And the total geographical area of the country is 32, 87,263 sq km out of which an area of 6, 75,538 sq km or 20.5 percent was under forests in forest cover falls to 23.81 percent of total geographical area in 2012. This is much below the average of 30.4 percent for the world, and total rain fed area is 97.90 in m ha it is increased to 85.70, an irrigated area is 20.85 in m ha in 1951 it is increased to 63.20 in m ha in 2011, and total food grain production is 50.8 MTs in 1951 it is increased to 257.0 MTs in 2011. What we are doing to the forests of the world is but a mirror reflection of what we are doing to ourselves and to one another – Mahatma Gandhi.

Climate also has a significant impact on the growth and viability of forests. A steady increase in average temperatures from global warming could dramatically alter today's pattern of tree distribution, thereby putting certain species under stress and encouraging the spread of other species. In order to understand the adaptability of indigenous tree species to changes in climate, researchers in Finland are measuring the success of various tree species. They have established an arboretum and a gene pool forest with various species of conifers and hardwoods to maintain genetic diversity. The aim is to determine the factors that regulate tree characteristics, and to produce different varieties of seeds suitable for forest regeneration. Agriculture is another important sector where phytotechnologies can be applied. The production and marketing of food and other farm products such as cotton and tobacco make up the world's largest single industrial sector. An important focus of crop research is to develop plants that are resistant to insect pests and diseases. The challenge for Indian agriculture, to put simply, is to increase production, while minimizing environmental impact. This includes conserving and protecting the quality of the resources that determine the performance of agriculture like land, water and air, reductions in yield, although determined by many factors, may be partially a consequence of land and water exploitation.

Forest is a biological entity in the fascinating web of nature and always in a state of dynamic equilibrium. Forestry sector is an important ingredient in the economic and social fabrics of a country. Forest in tropics play very significant role in regulating water cycle and in conserving soils. The demand for forest products and services in tropical countries increased rapidly in the recent past with the growth of population and rural economy. This increasing demand of forest produce and land hunger by the growing population and poverty in tropics are the main causes of deterioration in forest cover. The deterioration is the result of disproportionate withdrawals of forest produce as compared to its carrying capacity and regenerative capacity. The requirements of timber, pastures, fuel wood and diversion of forest lands for agriculture and various development projects in India have put enormous pressure on forests. The apparent alternative of a forestation on non-forest lands under social forestry and agro forestry activities has not picked up well in many parts of the country to the desirable extent. India, the seventh largest country, covers about 2 percent of total global land about 1 percent forest area and about 0.5 percent pasture land of the world, but supports about 17.5 percent of human and about 15 percent of cattle population of the world and this population is always in the process of increase. India is one of the 12 mega diversity countries commanding 7 percent of world biodiversity and supports 16 major forest types varying from alpine pastures in Himalayas to temperate, sub-tropical, tropical forests and mangroves in coastal areas. However, nearly half of the country's area is degraded, affected with the problems of soil degradation and erosion through the deforestation.

India has agriculture dominant economy, about 43 percent of land is under agriculture but the productivity is far below in comparison with developed countries because only one third of cultivated areas in the country are under irrigation. About 23 percent of land area is forestlands having productivity less than one cubic metre per hectare per year against the potential of eight to ten cubic metres per hectare per year. The present low productivity is due to growing biotic pressure and inadequate resources for scientific forest management. Nearly 4.6 percent area, are cultivable waste and 7.1 percent fallow land available for tree planting and pasture development. As per one estimation, more than half (about 53 percent) of country's lands are under various types of land degradation. The most common form of degradation is from wind and water erosion and salinity. About 146 million ha area is affected with wind and water erosion and 7 million ha. Has become degraded due to excessive salts. 8.5 million Ha, is under water logging and about 10 million ha is affected with shifting cultivation. Nearly 23 percent (76 million ha.) of country land has been recorded as forests but only 19.5 percent (64 million ha.) of total area has forest or tree cover which is much less to the goal of 33 percent set by the National Forest Policy, 1988. About 65 percent of forest cover has dense forest with crown density more than 40 percent and rest 35 percent are badly degraded. The crown density of dense forests is continuously depleting due to overuse of forest resources by the people and their cattle living in and around the forests, those have been depending on forest from the past. Another 6 million hectares recorded forest areas is virtually blank, even bereft of any rootstock due to excess biotic pressure.

The protective and productive role of forests in the national economy entitles them to lay claim to an adequate share of the land. National Forest Policy, 1952, for the first time set the goal to bring 1/3rd of total land area of the country under forest and tree cover and the same was adopted in the Forest Policy, 1988. To achieve this goal, it is imperative to plan for annual plantations of about 3 million ha. Degraded forests and scrub areas, all available wastelands and marginal lands and plantation in farmlands under social forestry and suitable agro forestry systems. The National Forest Policy, 1988 lays emphasis on massive need based and time bound programme of a forestation on degraded forests, wastelands, community lands and the lands of individuals including agricultural lands, with particular emphasis on the production of fuel wood and fodder. Policy also provides that the land laws should be so modified wherever necessary so as to facilitate and motivate to undertake tree farming and grow fodder plants, grasses and legumes on their own land. It is essential to develop large-scale woodlots for fuel wood, and industrial wood and timber to meet local and national needs with full involvement of all stake holders. Though it is difficult to increase forest cover in the present scenario of land hunger, it is possible to bring all possible categories of available wastelands under tree cover. Implementation of the National Mission for a Green India as part of the National Action Plan for Climate Change can further enhance the present mitigation potential of the forestry sector.

CONCLUSION

To conclude this paper sustainable agriculture has several benefits over modern agriculture, as it is cheap conserves water, soil, and environment, maintain crop diversity and the food grains produced are nutritious and free from pesticides residues. Therefore, shift from modern agriculture to sustainable agriculture is the need of the hour for the conservation of natural resources, environment, crop diversity, and production of nutritious food grains. The important of sustainable agriculture development goal is end hunger achieves food security and improved nutrition and promotes sustainable agriculture. By 2020, the agriculture production influenced rainfall, rainfall influenced forest area, forest area influenced climate, and the rainfall maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and ensure access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed, increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries, correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect. Under the changing agricultural scenario, the agricultural technologies needs a shift from production oriented to profit oriented sustainable farming. In this direction, the pace of adoption of Resource Conserving Technologies (RCTs) by the Indian farmers is satisfactory to a larger extent but, under the present scenario, we are in the half way of conservation agriculture. This systems will

leads to sustainable farming and will be the most thrust of the future farming. The conditions for development of sustainable agriculture are becoming more and more favourable. New opportunities are opening the eyes of farmers, development workers, researchers and policy makers. They now see the potential and importance of these practices not only for their direct economic interest but also as the basis of further intensification and ecological sustainability. Scarcity increases the complexity of future pathways of land use change. In a more interconnected world, agricultural intensification may cause more rather than less cropland expansion. The apparent trade-off between forest and agriculture can be minimized through spatial management and the use of degraded or low competition lands. This can be further addressed by community based forest management, which builds on political goodwill and strong community institutions. New challenges from climate change require urgent action to explore and protect the local value of forests for livelihood even more. The United Nations Collaborative Programme on Reducing Emissions from deforestation and forest degradation in developing countries was launched in 2008 and builds on the convening role and technical expertise of the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP). The UN-REDD Reducing Emissions from Deforestation and Forest Degradation Programme supports nationally led REDD processes and promotes the informed and meaningful involvement of all stakeholders, including indigenous peoples and other forest-dependent communities, in national and international REDD implementation. This is particularly true in the case of emerging activities undertaken as part of REDD activities where broad forest governance are aligned with it along with people participation ensuring livelihood benefits of the people dependant on forests. These renewed activities will safeguard traditional ways of life and the environmentally important forest ecosystems of the world.

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