



## Role of Agriculture in Sustainable Development in India

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### ABSTRACT

*India has been witnessing a blinding pace of growth and development in recent times. Experts are now calling for “sustainable development” and the term has gained currency in the last few years. In spite of fast growth in various sectors, agriculture remains the backbone of the Indian economy. This paper attempts to tackle and explore the issue of sustainable Development in agriculture in India district.*

**Keywords:** Sustainable Development, Agriculture, Ecological Sustainability, Economic Sustainability, Social sustainability.

### INTRODUCTION:

These slowdowns have worsened since 2000; both overall agricultural production and food grains production have shown negative growth rates in 2000-01 to 2002-03 periods. Decline in the growth rates of agricultural production and productivity is a serious issue considering the questions of food security, livelihood, and environment. As such, a critical examination of the approaches for sustainable agricultural development is necessary.

### OBJECTIVES –

**Objectives of this Research Paper is as follows**

1. To study of meaning of sustainable Development.
2. To observe the need of sustainable agriculture.
3. To Find out the way of sustainable development about Agriculture

### SUSTAINABLE AGRICULTURE DEVELOPMENT

The issues of sustainable development can be discussed under three broad types of farming Systems viz. traditional production method, modern agriculture method and sustainable Agriculture system. Further we can evaluate them across three dimensions, ecological, Economic and social sustainability

#### Ecological Sustainability

Most of the traditional and conventional farm practices are not ecologically sustainable. They abuse natural resources, reducing soil fertility causing soil erosion and contributing to global climatic change. But sustainable agriculture has some major advantages over traditional practices:

#### Soil Fertility

Continuous fall in soil fertility is one of the main problems in many parts of India. Sustainable agriculture improves fertility and soil structure.

#### Water

Irrigation is the largest consumer of fresh water, and fertilizer and pesticides contaminate both surface and ground water. Sustainable agriculture raise the organic matter content of the top



soil, thus raising its ability to maintain and store water that falls as rain. **Biodiversity** Sustainable agriculture practices involve mixed cropping, thus increasing the diversity of crops produced and raise the diversity of insects and other animals and plants in and around the fields.

### **Health & Pollution**

Chemicals, pesticides and fertilizers faultily affect the local ecology as well as the population. Indiscriminate utilize of pesticides, improper storage etc. may lead to health problems. Sustainable agriculture reduces the use of hazardous chemical and control pests. **Climate**

Conventional agriculture contributes to the production of greenhouse gases in various ways like reducing the amount of carbon stored in the soil and in vegetation, during the production of Methane in irrigated field and production of artificial fertilizers etc. By adopt sustainable agriculture system, one can easily overcome this problem

**Social Sustainability** Social sustainability in farming techniques is related to the ideas of social acceptability and justice. Development cannot be sustainable unless it reduces poverty. The government must find ways to enable the rural poor to benefit from agriculture development. Social injustice is where some section of the society is neglected from development opportunities. But having robust system of social sustainability can bridge the gap between “haves” and „have-nots”. Many new technologies fail to become applicable in agriculture sector due to lack of acceptability by the local society. Sustainable agriculture practices are useful because it is based on local social customs, traditions and norms etc. Because of being familiar the local people are more likely to accept and adopt them .Moreover, sustainable agriculture practices are based on traditional know-how and local innovation. Local people have the knowledge about their environment crops and livestock.

Traditional agriculture is more gender oriented, where woman bear the heaviest burden in terms of labour. Sustainable agriculture ensures that the burden and benefits are shared equitably between man and woman. While conventional farming focuses on a few commodities, sustainable agriculture improves food security by improving quality and nutritional value of food, and also by producing bigger range of products throughout the years. Traditional farming was also driven by the caste and wealth oriented people. The rich and higher castes benefitted more, while the poor and lower castes are left out. Sustainable agriculture attempts to ensure equal participation which recognizes the voice and speech of every people.

### **Indian Agriculture Sector**

Agriculture is one of the most preeminent sectors of the Indian economy. It is the source of livelihood for almost two third of the rural population workforce in the country residing in rural areas. Indian agriculture provides employment to 65% of the labour force, accounts for about 27% of GDP, contributes 21% of total exports and raw material to several industries. The livestock sector contributes an estimated 8.4% to the country GDP and 35.85% of the agriculture output. In India about 75% people are living in rural areas and are still dependent on agriculture, about 43% of India’s geographical area is used for agriculture activities. The estimated food grain production is about 211.17 metric tons in the country India’s position in world’s agriculture is given in the table below: Table 1(Source NIC)



Total Area	7th
Irrigated Area	1st
Population	2nd
Economically active population	2nd
Total Cereals	3rd
Wheat production	2nd
Rice Production	2nd
Milk	1st
Livestock (Buffaloes, Castles)	1st
Fish	7th
Production of Inland Fish	2nd

The total geographical area comes under the agriculture are 329 MH out of which 265MH represent varying degree of potential production. The net sown area is 143 MH out of which 56MH are net irrigated area in the country. India is a vast country with variety of land forms, climate, geology, physiography and vegetation. India is endowed with regional diversities for its uneven economic and agriculture development on account of

- Agro-Climate Environment.
- Agro-Ecological Regions.
- Agro-Edaphic regions.
- Natural resource Development.
- Human Resource Development.
- Level of Investment.
- Technological Development

#### **SUSTAINABLE AGRICULTURE IN INDIA**

Sustainable Agriculture can be simply defied as environmentally friendly methods of farming that allow the production of crops or livestock without damage to the farm as an ecosystem. A part from this, it also prevents the adverse effect on soil, water supplies, biodiversity, or other surrounding natural resources.

The concept of sustainable agriculture is an intergenerational one in which we pass on a conserved or improved natural resource base instead of one which has been depleted or pollution. Since the dawn of civilizations agriculture is one sector that impacts and in turn is impacted the Most by environment. Hence sustainability of the human race and this world depends a lot on the environmental friendliness of our agriculture.

India is facing a food crisis thanks to the systematic destruction of farmlands and food production systems over the last five decades through uncontrolled use of chemical fertilisers, pesticides, monocropping And other intensive agricultural practices. Instead of looking at the real problem the government is favoring false solutions like genetically engineered (GE) food crops. Ecological farming is the answer to the problems being faced by agriculture in our country today. It will also keep agriculture sustainable. This form of agriculture conserves our soil and water resources, protects our climate, enhances agro-diversity, ensures biodiversity, meets the demand for food and safeguards livelihoods. In short, it ensures that the environment thrives, the farm is productive, the farmer makes a net profit and society has enough nutritious food. India has a long



history of agriculture. Over centuries, farmers in this country devised practices to keep our farms sustainable. Practices like mixed cropping, crop rotation, using organic manure and postmanagement kept our agriculture sustainable. But things changed for the worse with the onslaught of alchemical intensive model of agriculture, imposed through the so-called Green Revolution in 1965. It was therefore not surprising when the International Assessment of Agricultural Science and Technology for Development [IAASTD], an initiative of the United Nations and World Bank, concluded

That small-scale farmers and agro-ecological methods are the way forward if the current food crisis is to be solved. This initiative involved a three-year review of all the agricultural technologies in the past 50 years by around 400 scientists across the world.

The IAASTD said that to meet the needs of local communities, indigenous and local knowledge need to be declared as important as formal science. This is a significant departure from the destructive chemical-dependent, one-size-fits-all model of industrial agriculture. The report also acknowledges that genetically engineered crops are highly controversial and will not play a substantial role in addressing the key problems of climate change, biodiversity loss, hunger and poverty

#### **NEED FOR SUSTAINABLE AGRICULTURE**

We can compare three broad types of farming: traditional production we can compare three broad types of farming: traditional production systems, conventional modern agriculture (such as Green Revolution technologies), and sustainable agriculture. We can compare them across three dimensions: ecological, economic and social

#### **WAYS OF SUSTAINABLE AGRICULTURE**

**Mixed Farming** – Sustaining agricultural productivity depends on quality and availability of natural Resources like soil and water. Agricultural growth can be sustained by promoting conservation and sustainable use of these scarce natural resources through appropriate location specific measures. Indian agriculture remains predominantly rain fed covering about 60% of the country's net sown area and accounts For 40% of the total food production. Thus, conservation of natural resources in conjunction with development of rain fed agriculture holds the key to meet burgeoning demands for food grain in the country. Towards this end, National Mission for Sustainable Agriculture (NMSA) has been formulated for Enhancing agricultural productivity especially in rain fed areas focusing on integrated farming, water use efficiency, and soil health management and synergizing resource conservation. NMSA derives its mandate from Sustainable Agriculture Mission which is one of the eight Missions outlined under National Action Plan on Climate Change (NAPCC).

**Mixed Farming-** Many farmers in tropical 7 temperate countries survive by managing a mix of different crops or animals. The best known form of mixing occurs probably where crop residues are used to feed the animal and excreta from animals are used as nutrients for the crop. Other forms of mixing takes place where grazing under fruit tree keeps the grass short or where manure from pigs is used to feed the fish. Mixed farming exists in many forms depending on external and internal factors .External factors are: Weather patterns, Market Price, Political Stability And technological Development. Internal Factors relate to Local soil characteristics, composition of



family and farmers Ingenuity. Mixedfarming provides farmers with a) an opportunity to diversify risk from single-crop production (b) to use labour more efficiently :( c)To have a source of cash for purchasing farm inputs;(d) to add value to crop or crop by product;(e) combining crops and live stocks.

**(e) Multiple cropping** – The process of growing two or more crops in the same piece of land, during the same season is called Multiple cropping .It can be right called a form of polyculture. It can be – (a) Double

Cropping (the practice where the second crop is planted after the first has been harvested) ;( b) Relay

Cropping (the practice where a second crop is started along with the first one, before it is harvested

### **CROP ROTATION**

The process of growing two or more dissimilar or UN related drop in the same piece of land indifferent seasons is known as Crop Rotation. This process could be adopted as it comes with a series of benefits like – (a) avoid the build-up of pests that often occurs when one species is continuously replenishment of nitrogen through the crop rotation is the replenishment of nitrogen through the use of green manure in sequence with cereals and other crops; (c) crop rotation can also improve soil structure and fertility by alternating deep-rooted and shallow – rooted plants;(d) It is a component of polyculture.

**Issues& Challenges** The central issue in agricultural development is the necessity to improve productivity, generate employment and provide a source of income to the poor segments of population. Studies by FAO have shown that small farms in developing countries contribute around 30-35% to the total agricultural output. The pace of adoption of modern technology in India is slow and the farming practices are too haphazard and unscientific. Some of the basic issues for development of Indian agriculture sector are revitalization of cooperative institutions, improving rural credits, research, human resource development, trade and export promotion, land reforms and Education.

**Future Prospects and Solution for India**Agriculture sector is an important contributor to the Indian economy around which socio-economic privileges and deprivations revolve and any change in its structure is likely to have a corresponding impact on the existing pattern of social equity. Sustainable agricultural production depends upon the efficient use of soil, water, livestock, plant genetics, forest, climate, rainfall and topology. Indian agriculture faces resource constraints, infrastructural constraints, institutional constraints, technological constraints and policy induced limitations. Sustainable development is the management and conservation of the natural resource base and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for the present and future generations. Such sustainable development (in the agriculture, forestry and fisheries sector) conserves land, water, plant and animal genetic resources, is environmentally non-degrading, technically appropriate, economically viable and socially acceptable. So, to achieve sustainable agriculture development the optimum use of natural resources, human resources, capital resources and technical resources are required. In India the crop yield is heavily dependent on rain which is the main reason for the declining growth rate of agriculture sector. These uncertainties hit the small farmers and labourer's



worst which are usually leading a hand to mouth life. Therefore something must be done to support farmers and sufficient amount of water and electricity must be supplied to them as they feel insecure and continue to die of drought, flood, and fire. India is the second largest country of the world in terms of population; it should realize it is a great resource for the country. India has a huge number of idle people. There is a need to find ways to explore their talent and make the numbers contribute towards the growth. Especially in agriculture passive unemployment can be noticed. The sustainable development in India can also be achieved by full utilization of human resources .A large part of poor population of the country is engaged in agriculture, unless we increase their living standard, overall growth of this country is not possible. If we keep ignoring the poor, this disparity will keep on increasing between classes. Debt traps in country are forcing farmers to commit suicides. People are migrating towards city with the hope of better livelihood but it is also increasing the slum population in cities. Therefore rural population must be given employment in their areas and a chance to prosper. India has been carrying the tag of “developing” country for quite long now; for making the move towards “developed” countries we must shed this huge dependence on agriculture sector.

### **Conclusion**

The trajectory of Indian agriculture and its associated environmental problems has brought about recognition that future agricultural growth and productivity will have to occur simultaneously with environmental sustainability. The environmental challenges, especially in terms of land degradation and groundwater depletion, water logging and excessive use of chemical inputs are posing problems for the future of Indian agriculture The agricultural technology needs to move from production oriented to profit oriented sustainable farming. The conditions for development of sustainable agriculture are becoming more and more favorable. New opportunities are opening the eyes of farmers, development workers, researchers and policy makers like agro related businesses, dairy farming, poultry farming castle farming and fisheries. Now the time is to see the potential and importance of these practices not only for their economic interest but also as the basis for further intensification and ecological sustainability. To conclude, a small-farm management to improve productivity, profitability and sustainability of the farming system will go a long way to ensure all round sustainability

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