



# SUSTAINABLE AGRICULTURE DEVELOPMENT IN INDIA

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## Abstract

The sustainable agriculture development of any country depends upon the judicious uses of their available natural resources. In fact agriculture determine the fate of a country especially like India because about two third of its population still lives in rural part with agriculture as its livelihood. If agriculture goes wrong due to any of the reason like drought flood or low monsoon it will be really bad for economy of the country. Improvement of agriculture sector can be done through rapid growth of agriculture by increasing area of cultivation, cropping intensity and productivity. Increasing productivity is a big challenge because due to increasing urbanization and industrialization land size of the country has reduced. Being agriculture based economy sometimes we are bound to use natural resources beyond limits. Sometimes pandemic like COVID-19 is disrupting some activities in agriculture and supply chain. Harvesting activities is seriously interrupted in many parts of the country due to non-availability of migrant labors. Sustainability can be broadly classified in to three types which are interrelated viz. ecological sustainability, economical sustainability and social sustainability. India has transformed itself from a country of shortages to country of surpluses. With the rapid growth of the economy, a shift is also being seen in the consumption pattern from cereals to more varied and nutritious grains like oats jwar and bajra and fruits and vegetables. Similar with the milk, fish, meat and poultry products. Many developing countries like India are moving from traditional subsistence agriculture to commercial agriculture. In India about 75% people are living in rural areas and dependent on agriculture, about 43% land of geographical area is utilized for agriculture. Estimated food grain production is about 211.17 metric tons in the country. Sustainable development is essential for economic development as now we have limited quantity of resources. India has played an important role in shaping the Sustainable development goals.

**Keywords:** Sustainability, Green Revolution, Indian Economy, Biotechnology etc.

## Introduction

The sustainable agriculture term is used for forming in sustainable ways meeting society's present food and

textile needs, without compromising the ability for current or future generations to meet their needs.

The term Sustainable agriculture came into existence since 1980 and although interpretations vary, it is usually understood as the improving agriculture practices for increased production without harming the environment. In developing countries priorities are given to the use and conservation of natural resources for food production in their development agenda and social and economic issues have been mostly neglected.

Now a days we produce enough food to end hunger and achieve food security but the main challenge remains, which is to provide food to every mouth and to produce more food where it is needed with the resource available. The problem remains same because still about 30% of produced is lost or wasted. Challenges are land and water issues and old cultivation techniques lack of information on marketing, poverty and degradation of natural resources and environmental issues.

The sustainable agriculture development of any country depends upon the judicious uses of their available natural resources. In fact agriculture determine the fate of a country especially like India because about two third of its population still lives in rural part with agriculture as its livelihood. If agriculture goes wrong due to any of the reason like drought flood or low monsoon it will be really bad for economy of the country. Improvement of agriculture sector can be done through rapid growth of agriculture by increasing area of cultivation, cropping intensity and productivity. Increasing productivity is a big challenge because due to increasing urbanization and industrialization land size of the country has reduced (Dev, 2009).

## Problems

We are paying a lot for modernization and industrialization in the form of degradation of environment. Environmental problems have become so serious in many parts of the country and hence cannot be ignored. Other challenges include land and water issues, cultivation techniques have become so old .Lack of information on marketing, poverty, degradation of natural resources, population growth and inadequate support services are other major constraints. Overexploitation of land may cause erosion and landslides Flooding blocks irrigation channels thus reduces the arability of the land. Sustainable agriculture avoids these problems by improving productivity and conserving the soil (Bhatia, 2006). Government of India imposed complete lockdown of the country on first wave of COVID-19 on March 23, 2020. This led to serious implications for farmers and supply of agro related products. The farming system is seriously disrupted. Supply chain is also disrupted. Due to non-availability of migrant labors some activity is interrupted in northwest India where wheat and pulses are harvested.

Due to migration of labors there is surplus of labors at some places of country while lack of labors at other places. This led to decline in wages at some places while increase in labour charges at others. The economic shock will likely be much more severe in India for two reasons. Firstly, pre COVID economy was already slowing down due to unemployment, low income, malnutrition and widespread inequality. Secondly India's large informal sector is vulnerable. Locking regular salaries or incomes migrant workers and informal workers are hardest hit during lockdown period. This is not the case with second wave according to Nitti Ayog member (agriculture) the second

COVID-19 wave will not impact the Indian agriculture sector in any way as rural area saw spread of infection in May when agriculture activities remained at bare minimum.

Freshwater withdrawals have doubled every 30 years in last 100 years, about 4000 km sq per year at present. In India 80% of surface water is utilized for agriculture. Out of 54% of the world's accessible fresh water 70% of consumption is accounted for agriculture purposes. Out of such huge withdrawal 80% of agriculture water is utilized by thirsty crops. WWF-India has identified 'thirsty crops' like Sugarcane, Cotton and Rice. Which happen to be major users of water from all forms.

Sustainable agriculture can be classified in to three types of farming systems:

1. Traditional production system.
2. Modern agriculture system.
3. Sustainable agriculture system.

Sustainability can be broadly classified in to threetypes which are interrelated:

- a. Ecological sustainability.
- b. Economical sustainability.
- c. Social sustainability.

### **Ecological Sustainability**

It is the demand of present time. We can reduce our impact on the natural environment by conserving the productivity of water soil and the ecosystem. It is very important for many reasons including environmental quality. We need clean air natural resources and a nontoxic environment Effect of climate change, pollution and other environmental factors can harm people's health, livelihood and lives. In fact ecological sustainability includes health of the land air or sea.

### **Ecological Sustainability Include Various Important Factors**

#### **Fertility of Soil**

The most important factor in crop yield. Various factors contribute towards its depletion when its fertility reduced and factors contributing towards fertility are not replaced. Excessive intensive cultivation and intensive forming over years reduce soil fertility. Sustainable agriculture assures fertility of the soil.

#### **Water**

Fresh water is highly consumed by irrigation. Pesticides and fertilizers contaminate both surface and ground water. Farmers in Andhra Pradesh rejected forgoing chemical pesticides in favor of natural methods. Millions of farmers in India have rejected chemical pesticides as part of a growing movement that favours natural alternatives. No pesticides management is a sustainable approach to pest control. Around 2000 natural forming

methods began as grass roots movements. Villages in Andhra Pradesh suffered from a number of health issues ranged from acute poisoning to death.

### **Bio Diversity**

For healthy environment different kinds of plants and animals live together. As the man entered in world's ecosystem his destructive activities caused loss of biodiversity. In fact human beings have deeply altered the environment. Several major threats to biodiversity are:

- a. Alteration and Habit fragmentation.
- b. Introduction of Exotic species and genetically modified organisms.
- c. Pollution.
- d. Climate change.
- e. Over exploitation of resources.

Sustainable agriculture ensures mixed cropping which increase the diversity of crops, insects, animals and plants in and around the field.

### **Environmental Pollution**

It is addition of undesirable substances to the environment wholly or largely by product of man's actions. Chemical pesticides and fertilizers adversely affect the ecosystem and population. Sustainable agriculture controls the use of hazardous chemicals and pesticides.

### **Conditions of Soil**

Large Food production is needed to ensure food for everyone. In such condition land has exploited badly. Sustainable agriculture avoids these problems by using bio fertilizers and other natural means.

### **Climate**

Our climate is badly affected by conventional method of agriculture as it produce poisonous greenhouse gases (water vapors, carbon dioxide, Methane, ozone and Nitrous oxide). Amount of Carbon, Nitrogen, stored in the soil decreasing day by day. By adopting Sustainable agriculture system this problem can be overcome.

### **Economic Sustainability**

Economic sustainability refers to practices that support long term economic growth without negatively affecting social, environmental, and cultural aspects of the community.

For agriculture to be sustainable it should be economically viable. Governments are sometime focusing on export rather than fulfilling domestic demands, which is not correct. Government should maintain balance between export and domestic demand. The main source of employment in rural areas is farming. Specialization in farming and mechanization may increase efficiency or increase production but they reduce the chance of employment on

land in rural area. Problems of unemployment can be overcome by small scale labour intensive activities.

### **Social Sustainability**

This aspect of social sustainability is the meeting the needs of today without compromising the ability of future generation to meet their own needs. Development cannot be sustainable until it reduces poverty or in other words we can say that when rural people get benefited from agriculture development. Sustainable agriculture is useful because it is based on local social customs and traditions. It also means that burden and benefits are shared equitably between men and women. Sustainable agriculture also ensures food security by improving quality and nutritional value of food and by producing bigger range of food throughout the year. (Alagh, 1995).

India has transformed itself from a country of shortages to country of surpluses. With the rapid growth of the economy, a shift is also being seen in the consumption pattern from cereals to more varied and nutritious grains like oats, Juar and Bajra and fruits and vegetables. Similar with the milk, fish, meat and poultry products. Many developing countries like India are moving from traditional subsistence agriculture to commercial agriculture. In India about 75% people are living in rural areas and dependent on agriculture, about 43% land of geographical area is utilized for agriculture. Estimated food grain production is about 211.17 metric tons in the country.

Varied agrochemical condition and rich natural resources made India world's largest producer of numerous commodities. The country is a leading producer of Coconut, Mangoes, milk, Banana, dairy products, cashew, ginger, turmeric pulses and black pepper. It is also the second largest producer of rice, wheat, sugar, cotton fruit and vegetables.

### **Green Revolution**

Given by M.S. Swaminathan in 1968 considered to be milestone in agriculture development of country. Various programmes like IADP (intensive agriculture district programme) led to the Green revolution. NABARD (National Bank for Agriculture Development) was set up which emphasized the high yielding varieties along with modern inputs like chemicals, fertilizers, pesticides and mechanization.

### **Ever Green Revolution**

This is basically idea of M.S. Swaminathan claims to be pro women, pro nature, and pro poor. Some key points are conservation of bio diversity, maintaining soil fertility, increasing the climate resistance of food and crop combined with better technology.

### **White and Yellow Revolution**

This was focused on milk and egg production.

### **Blue Revolution**

It is related with water and fish.

## Biotechnology a Useful Tool

Substantial enhancement of agricultural productivity is possible only through introduction of large scale irrigation, increased and judicious use of genetically modified crops. and multiple cropping and significant improvement in agriculture practices Bio technology can help meet the ever increasing need by increasing yields, decreasing crop inputs such as water, and fertilizers and providing pest control methods that are more compatible with the environment. (Singh and Parihar, 2015).

## Indian Agriculture and Reforms

India which is one of the largest agriculture based economies remained closed until 1990. India's economic reforms were initiated in June 1991. Actually structural adjustment programmes and economic reforms were launched in July 1991 in all the sectors except agriculture. As it is privately dominated sector the scope for reforms in this agriculture sector is limited.

The agriculture sectors output growth decreased during 1992-1993 to 1998-1999. The reason behind this decline is the quality of land which did not respond to modern inputs. No strategy of economic reforms can succeed without sustained and broad based agriculture development which is critical for raising living standard, fighting with poverty, assuring food security and making contribution to economic growth of country.

Khusro committee and Narsimham committee resulted in fall in farm investment and impaired growth. Agriculture development is the necessity to improve productivity, generate employment and provide a source of income to the poor segment of population. Adoption of modern technology in India is slow and the farming practices are too haphazard and unscientific. There is need of improving credits, research, trade and expert promotion, land reforms and education.

## Demand of Time for India

Our economy is agro based around which socio economic privileges revolve and any change in its structure has impact on social equity. Sustainable agriculture depends on use of soil, water, livestock plant genetic forest and rainfall.

Indian agriculture also faces time to time various types of constraints. Sustainable development is the management and conservation of natural resources. Such development need to conserve land, water plant and animal genetic resources in such a way that it becomes economically and socially acceptable. In India crop yield is heavily dependent on rain. So under the condition of drought or lack of monsoon, something must be done to support farmers. Sufficient amount of water and electricity must be supplied to them as they feel in secure and continue to die of drought, flood and fire. The sustainable development in India can also be achieved by full utilization of human resources. There is a need to find ways to explore their talent and make the numbers contribute towards the growth. A large part of population of the country is very poor. When we increase their living standard

overall growth of the country will increase.

Our agriculture should acquire profit oriented sustainable forming. Conditions are becoming favorable for sustainable agriculture due to developed technology researches and policy makers like agro related business. Now time is to see potential and importance of new practices for ecological sustainability. We should take lessons from the COVID crisis and new agro policies are made in such a manner so that we may overcome to future pandemics and sustainable development of agriculture system in India and other developing countries (Pawan Kumar and S.S.Singh2021).

Lastly we can say that for all round sustainability a balance is necessary between productivity, profitability and sustainability.

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