

# Agriculture Production in India-Challenges and Strategies

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## Abstract

Agriculture is the major sector of economic activity. It provides not only food and raw materials but also employment to a very large proportion of population. Agriculture has been source of livelihood for more than two thirds of our Indian population. It remains the backbone of our economy. The new agricultural strategy has changed the demand for input such as credit, extension services, farmer's trainings, transport, food processing, storage and marketing activities, which are required for generating higher production. India would have a population of 137 crores by the year 2025, 400 million tones of food grains production would be needed to feed this population. India has high population pressure on land and other resources to meet its food and development needs. The natural resources base of land, water and bio-diversity is under severe pressure. Expansion of area and rapid growth in productivity of wheat and rice, made possible by widespread adoption of improved varieties, expansion of agricultural research, demonstration and education, and investment in irrigation, supported by establishment of a national infrastructure to produce and supply inputs and to warehouse, distribute and market outputs.

**Key Words:** Agriculture, Food grains, Productivity

## Introduction

Agriculture is the major sector of economic activity. It provides not only food and raw materials but also employment to a very large proportion of population. Agriculture has been source of livelihood for more than two thirds of our Indian population. It remains the backbone of our economy. The new agricultural strategy has changed the demand for input such as credit, extension services, farmer's trainings, transport, food processing,

storage and marketing activities, which are required for generating higher production. India would have a population of 137 crores by the year 2025, 400 million tones of food grains production would be needed to feed this population. It would be therefore necessary to plan agricultural development on a sustainable level. Sustainable agriculture can be defined as production of sufficient food grains for the present as well as future generation without altering the quality of soil. The technology induced farming gave in for excessive usage of chemical fertilizers, pesticides and weedicides etc., bringing intensive agriculture. This indiscriminate use of synthetic pesticides not only pollutes our nature and natural resources but their toxic residues enter into animals and human through food chains and cause several health hazards. Also the lands are turning acidic leading to lesser production and ultimately to barrenness. In the race for higher production we are ignoring the resilience of the earth and have threatened the sustainability of the production. Thus sustainable production is one of the greatest challenges of the 21<sup>st</sup> century. Sustainability emphasizes on consistency of production with a long term benefit rather than a short term development. Hence in order to overcome such problems, it is advisable to start cultivation of different types of crops and preservation of the natural products that could have to be arranged with farmers to identify suitable farming technologies in maintaining the quality of the available natural resources. It is the responsibility of the government to educate the people in general and the farmers in particular to save the natural resource management in the required direction. Agriculture is India's backbone for the growth and development of the country's economy. Nearly 65 per cent of the Indian population is still dependent on agriculture for its livelihood and employment. It is also the source of supply of raw materials for industries and provides support to the transport system. In recent years there has been great diversification in Indian agriculture such as livestock, horticulture and fisheries. Today India occupies a significant place at the global level as the second largest producer of milk. Since India's Independence great strides have been made in the field of agriculture. Efforts made under the five year plans resulted in the growth rate of agricultural output by about 2.7 per cent per annum as compared with 0.8 per cent per annum during the first half of the 20<sup>th</sup> century. The Green Revolution of the 1960s initiated a gradual transformation of the traditional household agriculture into modern and scientific agriculture in several parts of India. The introduction of new technology in agriculture brought about unprecedented increases in yield and output of major cereal crops like rice and wheat.

### **Food grains production in India**

It is very significant that one third of the world's rice area in India i.e. 83 million hectares. It is grown in almost all the states of India but it is mostly concentrated in the river valleys, deltas, and low lying coastal area of North Eastern and Southern India. The rice producing states are Assam, West Bengal, Bihar, Madhya Pradesh, Orissa, Andhra Pradesh, Tamil Nadu, Kerala, Mysore, Maharashtra, Gujarat, Uttar Pradesh, Jammu

and Kashmir which together contribute over 95 per cent of the country's rice production. Of these, West Bengal, Orissa, Andhra Pradesh, Tamil Nadu and Bihar are the major rice producing states.

## **Food production: Indian Scenario**

### **Land Use**

Beginning with agricultural intensification, the amount of India's land area dedicated of food grain cropping has grows steadily, from 99.3 million hectares in 1950, to 127.5 million hectares to (ministry of Agriculture, 1995) and the total land used for agriculture currently almost 170 million hectares. An additional 12 million hectares fall under the classification of meadows and pasture and are utilized for animal husbandry. Much of this increment of land over the last four decades has come from previously forested areas, as well as marginal and hill areas. Future this also resulted in higher fertilizer and pesticide usage.

### **Fertilizer Consumption**

In the last three decades, Indian consumption of nitrogen, phosphorous and potassium fertilizer has grown at 9.5 per cent annually, making India the fourth largest consumer in the world. The most recent data places India's fertilizer consumption at 69.66 kg/ha. However, in the face of limited land availability and growing land degradation problems meeting the food requirements of an ever-increasing population will necessitate the consumption of fertilizer for crop production to increase to 22 mt in 2000.

### **Pesticide Consumption**

India has increased its consumption of insecticide, herbicides, fungicides, bactericides and rodenticides from only a little over 24 thousand tones in 1971 to 82 thousand tones in 1991. The largest figure is made up by insecticides, which comprise about two thirds of the total. It is believed that there is some potential for future gain in pesticide efficacy, as a portion of rural farmers are suspected to practice inappropriate application of the chemicals due to improper information etc.

### **Irrigation**

The area of agricultural land under irrigation has continued its growth from 32 per cent in 1970, to 43 per cent in 1990. The majority of this increase has come from increase water extracted from ground water supplies. This is significant because in many ways, ground water supplies can be considered a non-renewable resource. Finally, the demand for water for irrigation is expected to increase markedly over the next few decades in line with population growth. Estimation for 1990 place the demand for irrigation water at 46 million hectare meters, and project a growth to over 85 million meters by 2025. In India, nearly 46 million hectares of water from various water bodies like the rivers streams, lakes and aquifers are in use for irrigation of neatly 170 million hectares, which is also treated with millions of tones of chemical fertilizers and pesticides for improving yields resulting water quality degradation due to their residues.

## **Food Security**

The single most important implication of India's rapid population growth during the second half of the twentieth century was the threat it posed to national food security. That threat reached dangerous proportions in the mid 1960s, leading to the launching of the Green Revolution, achievement of food self sufficiency, and subsequently, a growing stock of surplus food grains by the mid 1970s. Happily, such a threat no longer exists for the country. Growth of food production has exceeded population growth for each of the past three decades. Statistics present a confusing picture of India's progress on food security. Both per capita food grain consumption and total calorific intake have declined slightly in recent years among all levels of the levels and real per capita expenditure on food is rising among all income groups. Increasing food consumption alone is not a sufficient condition for overcoming malnutrition in India. It is also necessary to address the factors responsible for the high incidence of gastrointestinal and respiratory infections as well as cultural factors responsible for faulty child feeding and weaning practices. Assured are necessary elements of a comprehensive strategy to eliminate malnutrition and achieve the goal of food for all before 2020.

## **Sustainable Food Security**

India will be required to produce more and more from less and less land and water resources. Alarming rates of ground water depletion and serious environmental and social problems of some of the major irrigation projects on one hand, and the multiple benefit of irrigation water in enhancing production and productivity, food security, poverty alleviation as mentioned earlier; are well known to be further elaborated here. In India, water availability per capita was over 500 cubic meter (m<sup>3</sup>) per annum in 1950. It now stands at around 2000 m<sup>3</sup> and is projected to decline to 1500 m<sup>3</sup> by 2025. Further, the quality of available water is deteriorating. Also, there are gross inequalities between and geographic regions.

## **Stages of Agricultural Development**

### **Pre – Green Revolution**

Boost in productivity growth of coarse grains and pulses per unit of land.

### **Green Revolution**

Expansion of area and rapid growth in productivity of wheat and rice, made possible by widespread adoption of improved varieties, expansion of agricultural research, demonstration and education, and investment in irrigation, supported by establishment of a national infrastructure to produce and supply inputs and to warehouse, distribute and market outputs.

### **Post Green Revolution**

Continued growth in productivity through intensification of chemical and labour inputs, followed by a gradual decline in productivity growth. Expansion of area under maize, cotton, sugarcane and oil seed.

## **Commercialization**

Further diversification of cropping patterns from low value to high value crops such as fruits, vegetables, flowers and other horticulture crops for domestic consumption, processing and export.

## **Challenges, Policies and Strategies**

### **Enhancing Yield of Major Commodities**

Yield of major crops and livestock in the region is much lower than that in the rest of the world. Considering that the frontiers of expansion of cultivated area are almost closed in the region, the future increase in food production to meet the continuing high demand must come from increase in yield. There is a need to strength adaptive research and technology assessment, refinement and transfer gaps are bridge. For this, an appropriate network of extension service needs to be created to stimulate and encourage both top-down and bottom-up flows of information between farmers, extension workers, and research scientists to promote the generation, adoption and evaluation of location specific farm technologies. Ample scope exists for increasing genetic yield potential of large number of vegetables; fruits as well are other food crops and livestock and fisheries products. Besides maintenance breeding, greater effort should be made towards developing hybrid varieties as well as varieties suitable for export purposes. Agronomic and soil researches in the region need to be intensified to address location specific problems as factors productivity growth is decelerating in major production regimes research on coarse grains, pulses and oil seeds must archives production breakthrough. Hybrid, rice, single cross hybrids of maize and pigeon pea hybrids offer new opportunities soybean, sunflower and oil palm will help in meeting future oil demands successfully. Forest cover must be preserved to keep-off climatic disturbance and to provide enough of fuel and fodder, milk, meat and draught capacity of our animals, needs to be improved quickly through better management practices.

### **Trend in Food Production**

Over the years, India has made rapid progress in the production of food. The annual growth rate of food production including non-cereal food increase from 2.1 per cent during the 1960s to three per cent in the subsequent decade and further to 3.8 per cent during the 1980s. Between 1960 and 1980 food production barely kept pace with the population but in the 1980s per capita food production increased at a satisfactory rate of 1.6 per cent per annum. There seems to have been some diversification in food production in the 1980s on account of the impressive growth of output of oilseeds and livestock products. The diversification of food production more or less conforms of the growth pattern of domestic demand.

**Table - 1****Annualized Compound Growth Rates of Food Production and Population Growth**

Year	Food production		Population Growth %
	Aggregate	Per capita	
1961-63 to 1971-73	2.11	-0.10	2.24
1971-73 to 1981-83	3.00	0.84	2.23
1981-83 to 1991-93	3.77	1.62	2.02
1991-93 to 1997-99	2.72	0.90	1.84

Source: FAO, state of Food and Agriculture

The growth of food production down to 2.72 per cent per annum in the nineties. Ironically, even at the low growth rate food grain production, the supplies outstripped the effective demand and nineties has been a rapid increase in the stock of food grains held by the government. Disposal of stock has become a cause of concern. The domestic supplies are more than adequate to prevent food gaps.

**Food Demand**

The food demand will be driven by income and population growth, urbanization, food prices and income distribution. Food demand projections have been made using the piece-wise linear expansion systems model developed at centre for economic and social studies, Hyderabad. The projections given below assume real expenditure growth of five per cent per annum between 2000 and 2020, increase of population to 1.343 billion in 2020, rate of urbanization and rural urban disparity consistent with the historical trends and the inequality in the income distribution and relative price same as in 1998. Under these assumptions the demand is projected to grow at 2.2 per cent for cereals during 2000-10 and two per cent during 2010-20, three to four per cent for edible oils and pulses, and four to five per cent for milk and milk production meat, fish, sugar and guar.

**Present Situation of Indian Agriculture**

The following are some of the important features of Indian agriculture: Agriculture provides direct livelihood to 59 per cent of the labour force in India. 75 per cent of India's population below the poverty line lives in rural areas, and is directly or indirectly dependent on agriculture. Agriculture contributes more than 22 per cent of GDP (2007 estimates), although the share has progressively come down from 57 per cent in 1950-51. In developed countries like the UK and USA, the share of agriculture in GDP is only around two per cent. It

accounts for about 10 per cent of total value of India's commodity exports. Bulk of agricultural exports consists of 13 key commodities including tea, coffee, tobacco, cashew, spices, raw cotton and sugar.

### Results Discussion

In a predominantly agrarian economy, the overall rate of economic growth depends, to a very large extent on the rate of growth in agriculture. The achievement in the agricultural sector will continue to be a determining factor in achievement of plan targets for many years to come. The success or failure to programme of agricultural development, in turn, depends decisively on the way farmers react to the programme, since it is ultimately the farmers who make the final allocation of land and other resources for the crop enterprises. India is an economy the largest part of which including agriculture lies outside the sphere of centralized control and market mechanism is a significant factor to reckon with. The research not only deals with the agricultural production but also deals with the food grains to the people in India. Agricultural crops can be broadly divided into three categories namely, Rice, Wheat and Pulses.

### Suggestions

Agricultural research and educational system of the country can be strengthening the agricultural production and advancement can be used for diversification of farming system and cropping pattern. The modern information and communication technology can be used to increase the food grains production.

### Conclusion

A reform introduced in the 1991's has not resulted in a significant increased in the production of major food grains to such as rice and wheat. And also the kilogram per hectare yield of these grains had declined considerable during the post reform period. The area under cultivation of wheat and maize has increase at the cost of decline in the area under rice. On the whole in the post reform period, there was a setback in the agricultural production and yield in kg. per hectare of the major food crops. Since agriculture is the backbone of Indian economy it is essential to take substantial measures to improve the agricultural production. In the post reform period the public investment in agricultural sector has slowed down Government investment is essential to provide basic infrastructure facilities to agricultural sector. Subsidies should be given in a gathered manner so that only small and marginal farmers will be benefited.

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