

# Input Analysis of Agriculture in India: With Special Reference to Irrigation

## Abstract

Without agriculture, man can't live and without irrigation man can't have agriculture".

India is a developing economy and based upon the agriculture. Indian agriculture is endowed with many specialties' as different types of soil, variety of crops, different weather conditions, different farming methods and tastes'. After introduction of five years plan for development Indian government gives priority to this sector. Produce additional food with limited land and providing economic access to food at the household level for ensuring food security would continue to be a major challenge for the nation. Various attempts have been made to enhance the growth in agricultural output in terms of area and yield components. Indian agriculture is considered as a gamble of monsoon. After development of irrigation facilities there is a certainty about the crops production. Our irrigation system is different as we use many sources for irrigation .As ground water, wells; canal tanks etc .India has experienced considerable changes in the crop mix, yield and production since the inception of the Green Revolution. The first post green revolution phase (from late 1960s to mid1980s) was marked by the continued growth in return from land though the intensification in use of chemical input and machine labor. The second post green revolution phase (beginning the mid 1980s) was characterized by high – input use and decelerating productivity growth. Irrigation makes the agriculture profitable as it increased the land use, yield, crop diversification etc. But there are some leakages in the sector which make the progress hindered, This paper is a modest attempt to highlighted the role of irrigation in promoting the growth agriculture .Some suggestion have been made to overcome the situation . Findings may be beneficial for the society as well as policy makers.)

**Keywords:** : Indian agriculture, irrigation, development, green revolution.

## Introduction

India, a country of villages , with majority (68.2% ) of its population living in the rural areas Even after 69 years of its independence ,rural India still plagued with problem of the poverty , unemployment , economic inequality . It is the biggest and fastest growing economies of the world. Developing economy means that our economy depends upon the primary sector. Food is essential for human beings as well as animals for their existence. Archaeological studies have revealed that in ancient times man satisfied his hunger by eating fruits from the forest and drinking water from natural streams .Cultivation starts with the growing demand of food. But sufficient water was not available and irrigation started with the use of water from the pond, streams and rivers for agriculture. Mesopotamian, Indus-valley, Persian, Egyptians civilizations revealed the use of river water for agriculture in the absence of insufficient rain. About 689 million acres of agricultural land in the world endowed with irrigation facilities. Out of which 68% in Asia,17% in North America, 9% in Europe, 5% in Africa and 1% in Oceania. India is a land of monsoon which is irregular and erratic in nature. Irrigation system helps the farmer to have less dependency on rain water.

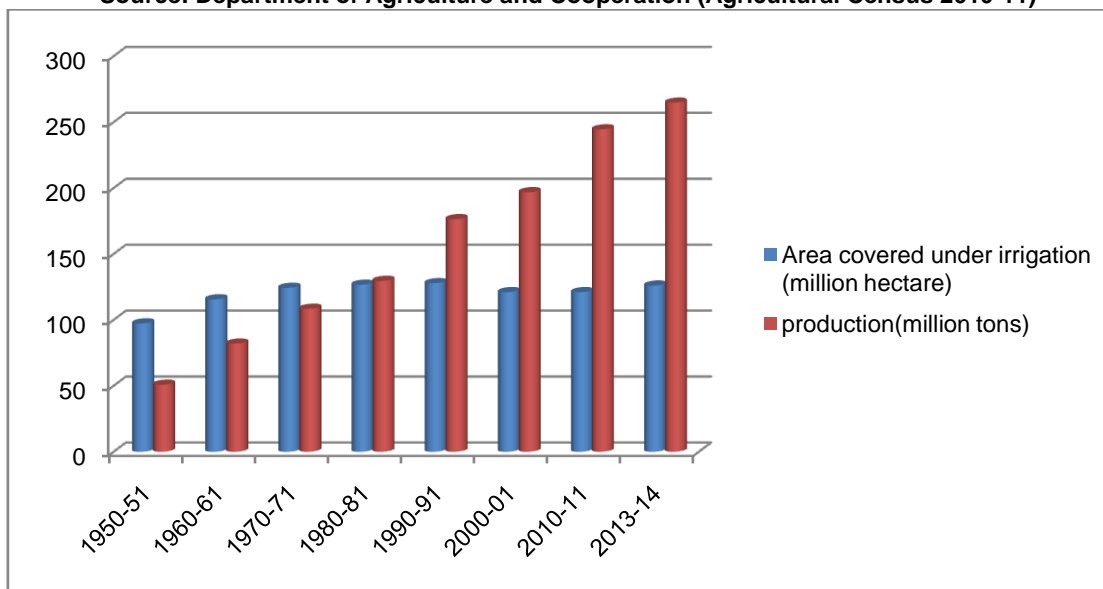
Irrigation refers to the process of supply of water through artificial mean such as pipes, ditches, sprinklers. Artificially supply of water to agricultural land at the right moment in an appropriate volume for proper growth of plants in order to get maximum yield of cultivation is technically called irrigation. During green revolutions era large investment were made on research and development for the irrigated agriculture. In India area covered under irrigation is revealed with a table.

## Yamini Pandey

Associate Professor,  
Deptt.of Economics,  
Govt. Girls Degree College,  
Behat, Saharanpur,  
U. P.

Year	Area covered under irrigation (million hectare)	Production (million tons)
1950-51	97.32	50.82
1960-61	115.58	82.02
1970-71	124.32	108.42
1980-81	126.67	129.59
1990-91	127.84	176.39
2000-01	121.05	196.81
2010-11	126.67	244.49
2013-14	126.04	264.77

Source: Department of Agriculture and Cooperation (Agricultural Census 2010-11)



This table and graph revealed that total irrigated area after independence is increases. Any data regarding irrigation in India is based upon “measures the area irrigated by any source of irrigation’ not on quality, field, crop or individual kind of source.

**Objectives of the Study**

The specific objectives of the proposed study are as-

1. To assess the role of irrigation in agricultural development in India.
2. To assess the various aspects of Indian agriculture and irrigation.

3. To find out some measures to meet out the challenges before the sector.

**Research Methodology**

Data collected for the work through various secondary sources.

**Sources of Irrigation**

The main sources of irrigation in India are wells, canals, tanks and ground water supply .Expansion of irrigation since the 1980 has primarily taken place through increase use of tube wells. There are various sources of irrigation in india. Net irrigated area, by source India can be depicted in the table—

**Table-2 (Million Hectares)**

Year	Government canals	Private canal	Canal (total)	Tanks	Tube wells	Other well	Other sources	Net Irrigated area
1950-51	7.158	1.137	8.295	3.613	nil	5.978	2.967	20.85
1960-61	9.17	1.2	10.37	4.561	0.135	7.155	2.44	24.66
1970-71	11.972	0.866	12.838	4.112	4.461	7.426	2.2661	31.1
1980-81	14.45	0.842	15.292	3.182	9.531	8.164	2.551	38.72
1990-91	16.9728	0.4804	17.4532	2.944	14.257	10.437	2.932	48.02
2000-01	15.762	0.203	15.965	2.455	22.569	11.26	2.885	55.13
2010-11	-----	-----	17.005	22.495	29.108	11.971	4.289	64.62

Source: Directorate of economics and statistics, Department of agriculture and cooperation , ministry of agriculture , government of India(agricultural census 2010-11)(internet)

There has been a considerable decline in the extent of direct irrigation from canals. Nearly three fourths of the expansion in net irrigated area has come from ground water. Here is progressive shift to

bore wells and deep tube wells. States in the Indo-Genetic plain have the highest irrigation ratios followed by Andhra Pradesh and Tamil Nadu. In Asia 89% dams are meant to provide irrigation with only a

very small proportion being used for generating electricity, flood control, domestic use and other purposes. Irrigation wells are largely concentrated in Asia. Another fact is that in Asia 80% of total area irrigated by groundwater in the world.

#### **Type of Irrigation**

There are various types of irrigation in India.-

#### **Surface Irrigation**

It is most common form of irrigation. It is a group of applications. In which water is applied and distributed over the soil surface by gravity. When water flows and infiltrates to the subsoil, land gets flooded, dikes are constructed to control the water level.

#### **DITCH irrigation**

It is a localized method, where ditches are dug out and seedlings are planted in rows. The plantings are watered by placing canals or furrows in between the rows of plants. Siphon tubes are used to move the water from the main ditch to the canals.

#### **Terraced Irrigation**

In the hill areas land is cut into steps and supported by retaining walls. The flat areas are used for planting and the idea is that the water flows down each step, while watering each plot. This allows steep land to be used for planting crops. This is a very labor-intensive method of irrigation

#### **Drip Irrigation**

Water drops right near the root zone of a plant in a dripping motion. This system reduces the loss of water through evaporation and runoff. This is the most water efficient method of irrigation

#### **Sprinklers irrigation**

In this irrigation system water is distributed through high pressure sprinklers, sprays or guns. The sprinklers are located in one or more central locations. It is a popular irrigation system for use on golf courses and parks.

#### **Rotary Systems**

The word "Rotary" is indicative of the mechanical driven sprinklers moving in a circular motion, hence reaching greater distances. This method of irrigation is used for larger areas, for the sprinklers can reach distances of up to 100 feet.

#### **Center Pivot Irrigation-**

This is a form of overhead irrigation. Steel or aluminum pipes are joined together, supported by trusses, mounted on wheeled towers. The sprinklers are situated on the length of the tower and they move in a circular motion.

#### **Manual Irrigation**

In this labor intensive technique, bucket and water cans are used to carry and distribute water.

#### **Impact of Irrigation on Agriculture**

Indian economy is primary sector dominate economy. Agriculture is the backbone of Indian economy and irrigation is the backbone of Indian agriculture. Irrigation helps the Indian agriculture as--

1. We can control the droughts and famines effectively. During the months of inadequate rainfall the crops are supplied water and winter crops can be sowed.
2. After green revolution use of high breed seeds augmented .Now crops can produced at any

seasons. Irrigation system has enabled the framers to produce crops even on during dry season.

3. It helps the farmers to produce in the soil which have less water retaining capacities.
4. Irrigation helps the farmer to utilized land for agriculture and diversification of crops can be harvested. Thirsty plants like jute and paddy can be grown.
5. It reduces fluctuation in the yield and the risk of crop failure due to drought.
6. It helps the hike in the demand for irrigation equipments and their industries.

#### **Limitations of Irrigation**

Perfection is paralysis. As there are some limitation which hamper the growth or hindered the proper utilization of irrigation facilities.

1. Central assistance for irrigation is given to the states without any effective mechanism to define and enforce transparent contracting procedures.
2. There is no central monitoring of even public sector programmes for minor surface works.
3. Monitoring of actual progress of works on the ground has become more and more lax.
4. Another problem is of the underutilization of the irrigation potential created by completed projects. The degree of underutilization of these projects has increase from around 8 percent in 1960s to 19 per cent in recent years.
5. The most important problem of the sector is delays in completion of projects. In the irrigation sector right from the First Five Year plan has been the tendency to start more and more new projects resulting in wanton proliferation of projects. There have been delays in the land shaping, land leveling water courses and construction of field channels in most of the projects
6. Being state subject irrigation is always disputed. In India all major rivers are inter-state in character, and the planning about the water resources has made according to individual interest.
7. Narrow regional outlook brings inter-state rivalries over distribution of water supply.
8. Over exploitation of ground water and insufficient recharge from the rain water results a decline in water table. In our country especially dry region revealed this fact.
9. Now there will be a high cost of irrigation. It is the most important problem that the cost of providing irrigation has been increasing ten times from First Five Year plan to Twelfth Five Year plan.
10. Early planning period the public irrigation scheme showed a surplus after meeting all the expenses but now the situation has been changed. There are losses in operating irrigation projects.
11. This sector facing a huge problem of water-logging and soil salinity .Sooner or later in many irrigation project areas due to over irrigation and deep percolation and seepage losses in the absence of a suitable drainage system.
12. Over irrigation and alarming rates of ground

water depletion in the IGP have caused land degradation and other environmental problems.

13. . There is a wide disparity in the development of irrigation. As the Ninth Five year plan indicates that the water resource development in North Eastern region through major medium and minor schemes is only at the level of 28.6 percent whereas in the Northern region it has reached about 95.3 per cent.
14. The slowing down of emphasis on extension will further widen the gap in the adoption of technology.
15. Water pricing policies are not favorable.
16. Many canal irrigation projects on account of deterioration of infrastructure, accumulation of silt in reservoirs and poor irrigation management practices.

#### **Development path of irrigation in India**

Development policies in India always agriculture oriented .From the beginning of planning 1950-51 irrigation schemes categorized on the basis of project cost but in 1978 this measurement has been changed, as major schemes having CCA (cultivable command area) between 2,000 hectares and 10,000 hectares and minor schemes as those having CCA of less than 200 hectares. The investment on irrigation has been increased by rs.455 crore in first plan to 36,649 crore in eighth plan. Government has introduced many plans as Common Area Development programme, flood control programme, Rural infrastructure development fund, and Accelerated irrigation benefit programme .Agriculture facilities provided to the farmer on subsidized rate.

#### **Conclusion and suggestion**

After independence Indian agriculture revealed the fact that we are progressing in every field ,irrigating facilities has increases and our agriculture has been saved The new economic regime initiated since early nineties has led to returning of the goals of Indian agriculture towards global competitiveness and export orientation without compromising the basic premise of self –reliance. Many factors decided the development of any sector. As policy, support, production strategies, public investment in infrastructure, research and extension for crop, live stock and fisheries have significantly helped in increasing the agricultural production .There is a wide difference with regards to extent of application of modern technology skill, and literacy level of farmers' individual farm size holding and infrastructural support and subsidization of products between developed countries with India. In order to provide equal opportunities in agriculture trade to all the economies of the world some measures should be taken

1. To remove the problem proper soil management practices, including provision of suitable field irrigation channels and drainage system must be undertaken.
2. The sharp fall in public sector investment in agriculture has been the main cause for the deceleration of agricultural growth and development. There must be an extension in the investment.
3. Extension services need to be strengthened by

scaling up investment levels and improving the quality of extension.

4. There should be an increment of the availability of operating funds.
5. Infrastructure must be developed .and policies must be transparent.

#### **References**

1. "India's agricultural export under the WTO regime" Kalpana Sharma and Nar Singh ,UPUEA Economic journal ,vol-8,No-8,April-2015
2. "Water resources of India", A.Vaidyanathan, Oxford university press ,2013
3. "Agricultural productivity trends in India: sustainability issues"-Pradiman kumar and surbhi mittal, "Agricultural economics research review,vol—19,conference no-2006, pp—71-88
4. '-Necessity of irrigation in Indian agriculture by Anil Bose (internet).
5. -Irrigation importance sources development and limitations by Tusar seth (internet)
6. Benefits of irrigation to agriculture -- ,Ramachandran .V, edited by Jason.c.ahavis (internet)
7. . "Agriculture statistics index at a glance 2014",by Government of India, Ministry of agriculture ,department of agriculture and cooperation and directorate of economics and statistics (internet)
8. "Development sustainability equality and women issues", H.K.Sawhney ,Elite publishing house pvt .Ltd, New Delhi,2006
9. M. Dinesh kumar,V.Ratna Reddy,A Narayanamoorthy,and M.V.K Sivamohan, "Analysis of India's irrigation statistics", Economic and political weekly,48(45-46),Nov,2013
10. Economic survey 2012-13, Govt.of India
11. Dutta & sunderam, "The Indian economy", Himalaya publishing house new Delhi