

IRRIGATION AND ECONOMIC DEVELOPMENT



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CHAPTER 18

SOURCES, IMPORTANCE, METHODS OF AGRICULTURAL IRRIGATION AND ECONOMIC DEVELOPMENT

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Abstract

Irrigation is that the artificial manifest application of water to land for the aim of agricultural production. Effective irrigation will influence the whole growth process from seedbed preparation germination root growth nutrient utilization plant growth and regrowth yield and quality. The key to maximizing irrigation efforts is uniformity. The producer features a lot of control over what proportion water to provide and when to use it but the irrigation system determines uniformity. Deciding which irrigation systems is best for your operation requires a knowledge of kit system design plant species growth stage root structure soil composition and land formation. Irrigation systems should encourage plant growth while minimizing salt imbalances leaf burns erosion and water loss. Losses of water will occur because of evaporation wind drift run-off and water (and nutrients) sinking deep below the idea zone.

Read Also: Artificial Irrigation, Growth, And Nutrient Utilization.

Keynote: Manifest, Indigenous Irrigation, Germination, and Erosion.

Keywords: Irrigation, growth, water, plant, root, soil, systems, system, uniformity, land.

Introduction

Indigenous irrigation facilities to be employed by the Indian farmers for the rationale to develop the agricultural activities for the aim of satisfied needed for the nutrient food. Irrigation is that the artificial manifest application of water to land for the aim of agricultural production. Effective irrigation will influence the whole growth process from seedbed preparation germination root growth nutrient utilization plant growth and regrowth yield and quality. The key to maximizing irrigation efforts is uniformity. The producer features a lot of control over what proportion water to provide and when to use it but the irrigation system determines uniformity. Deciding which irrigation systems is best for your operation requires a knowledge of kit system design plant species growth stage root structure soil composition and land formation. Irrigation systems should encourage plant growth while minimizing salt imbalances leaf burns erosion and water loss. Losses of water will occur thanks to evaporation wind drift run-off and water (and nutrients) sinking deep below the idea zone. Fertilisers need to be 'watered into' rock bottom so on best facilitate plant growth. to use areas which may preferably be 'less productive'. Irrigation can allow farmers to open up areas of their farms where it'd preferably be 'too dry' to grow pasture/crops. This also gives them the potential to

carry more stock or to conserve more feed. to take advantage of market incentives for unseasonal production

Sources of Water Irrigation

The overwhelming majority of irrigation water use is pumped directly from a water source (river dam or bore)

The principal sources of irrigation in India are often divided into the following:

- (i) Canals
- (ii) Wells
- (iii) Tanks and
- (iv) Others

Approximately 31% of the irrigated areas in India is watered by canals This includes large areas of land in Punjab Uttar Pradesh Bihar and parts of southern states Wells are now cover large areas of Punjab Uttar Pradesh Rajasthan and Tamil Nadu Tanks are constructed for storing water in season which is subsequently used for irrigation purposes

Benefits of Irrigation

Irrigation helps to grow agricultural crops maintain landscapes and revegetate disturbed soils in dry areas and through periods of but average rainfall Irrigation also has other uses in crop production including frost protection suppressing weed growth in grain fields and preventing soil consolidation.

A large population in India depends on Agriculture But agriculture in many parts of the country is rainfed This excessive dependence on rainfall may adversely affect crop production just in case the rainfall is deficient it's therefore imperative to completely exploit the bottom and surface water potential for irrigation purpose in order that over dependence on rainfall are often avoided and remedial measures put in situ within the event of failure of rainfall in sight of the importance of assured supply of water for agricultural output and food security many major medium and minor irrigation schemes were introduced after independence in order that an alternate source of irrigation is out there to the farmer within the event of deficient rainfall thanks to the introduction of an outsized number of irrigation schemes within the country the world under irrigation has increased significantly Small holding sizes are typical characteristics of Indian agriculture Majority of the farmers have very low income as only a little piece of land is out there to them for cultivation during this context the minor irrigation schemes within the country are especially important to the farmers belonging to the present category These schemes provide the farmers with controlled and timely irrigation which the new high yielding sorts of crops demand Such schemes are labour intensive need less time for completion and need low investments for his or her commissioning Therefore various development programmes within the States/Union Territories (UTs) are aimed toward creating innumerable number of latest minor irrigation schemes.

Importance of Irrigation

- (i) Insufficient uncertain and irregular rain causes uncertainty in agriculture the amount of rain is restricted to only four months during a year June to September when monsoon arrives The remaining eight months are dry there's some rainfall during the months of December and

- January in some parts of the country Even during monsoon the rainfall is scanty and undependable in many parts of the country Sometimes the monsoon delayed considerably while sometimes they cease prematurely This pushes large areas of the country into drought conditions With the assistance of irrigation droughts and famines are often effectively controlled.
- (ii) Higher productivity on irrigated land Productivity on irrigated land is considerably quite the productivity on un-irrigated land.
 - (iii) Multiple cropping possible Since India features a tropical and sub-tropical climate it's potentialities to grow crops on a year-round basis since 80% of the annual rainfall is received in but four months multiple cropping is usually impossible Provision of irrigation facilities can change the growing of two or three crops during a year in most areas of the country this may considerably enhance agricultural production and productivity.
 - (iv) Role in new agricultural strategy the successful implementation of the High Yielding Programme enhances agricultural production to an excellent extent.
 - (v) Bringing more land under cultivation Total reporting area for land utilization statistics was 30605 million hectares in 1999-2000 Of this 1944 million hectares was current fallow land Current fallows include lands which are lying fallow for fewer than one year aside from current fallows includes land lying un-ploughed for one to 5 years Cultivable waste land comprises another 1383 million hectares Cultivation On all such lands is impossible in some cases while in others it requires substantial capital investment to form land fit cultivation Provision of irrigation facilities can make some portion of this land cultivable.
 - (vi) Reduces instability in output levels Irrigation helps in stabilizing the output and yield levels It also plays a protective role during drought years Since both income and employment are positively and closely associated with output prevention of fall in output during drought is a crucial instrument for achieving stability of income and employment within the countryside Irrigation has enabled many nations to accumulate 'partial immunity' from drought.
 - (vii) Indirect benefits of irrigation Irrigation confers indirect benefits through increased agricultural production Employment potential of irrigated lands increased production helps in developing allied activities means of water transport etc are improved income of state from agriculture Availability of normal water system will increase the income of farmers imparting a way of security and stability in agriculture.

Methods in Agricultural Irrigation

Irrigation is that the method during which a controlled amount of water is supplied to plants at regular intervals for agriculture In simple words it's when people supply water to plants to assist them grow when there's not enough rain Irrigation water are often pumped from rivers lakes and wells or allowed to flow to the fields by the force of gravity along pipes or open canals The methods in agricultural irrigation are:

- Surface,
- Sprinkler
- Center pivot and
- Manual irrigation

(i) Surface

In surface irrigation water moves over and across the land by simple gravity flow to wetland and infiltrate the soil

(ii) Sprinkler

It's a well-liked method which pipes with a group amount of water to the fields then sprays it directly over the crops with high-pressure sprinklers. The benefit is that the amounts of water are often controlled

(iii) Drip

Drip water is delivered at or near the basis zone of plants drops in drop this method is that the most water efficient of irrigation

(iv) Center Pivot

It involves a self-propelled system during which one pipeline moves on wheeled towers during a circular pattern

(v) Manual

This type uses buckets or watering cans. It's a standard method utilized in our backyard farms.

Limitations of Irrigation

Despite large-scale investment and expansion of irrigation facilities, it's a matter of great concern that about 60 per cent of the entire cropped area remains hooked in to rain. There are varieties of problems associated with irrigation and that they need to be solved.

Delays in Completion of Projects

The biggest problem in our major and medium irrigation sectors right from the primary Five Year Plan has been the tendency to start out more and more new projects leading to wanton proliferation of projects. There's also delay in utilization of potentials already present. In most of the projects, there are delays in construction of field channels and water courses, land leveling and land shaping.

Inter-state Water Disputes

Irrigation may be a state subject in India. Development of water resource is, therefore, being planned by states individually taking under consideration their own needs and requirement. However, all major rivers are inter-state in character. As a result, differences with reference to storage, priorities and use of water arise between different states. Narrow regional outlook brings inter-state rivalries over distribution of water system.

Regional Disparities in Irrigation Development

The Ninth Five Year Plan Document estimated that the water resource development in North Eastern region through major, medium and minor schemes is merely at the extent of 28.6 per cent whereas within the Northern region it's reached about 95.3 per cent. This means a good regional variation within the development of irrigation facilities.

Water Logging and Salinity

Introduction of irrigation has led to the matter of waterlogging and salinity in a number of the states. The working party constituted by the Ministry of Water Resources in 1991 estimated that about 2.46 million hectares in irrigated commands suffered from water logging. The working party also estimated that 3.30 million hectares had been suffering from salinity/alkalinity within the irrigated commands.

Increasing Cost of Irrigation

The cost of providing irrigation has been increasing over the years from the primary Five Year decide to Twelfth Five Year Plan.

Losses in Operating Irrigation Projects

While just before independence (1945-46) public irrigation schemes showed a surplus after meeting working expenses and other charges. The position deteriorated considerably within the post-independence period.

(vii) Decline in water level

There has been a gentle decline in water level within the recent period in several parts of the country, especially within the western dry region, on account over exploitation of spring water and insufficient recharge from rain water.

Irrigation and Economic Development

The failure of rapid economic process to cause poverty reduction in commensurate manner is additionally another major concern linked with stagnant agriculture. ... Neither the goals of India's irrigation policy nor our irrigation development strategy jives with the truth of our irrigation economy today. Increase in agricultural production and productivity depends, to an outsized extent, on the supply of water. Hence, the importance of irrigation is, however, the supply of irrigation facilities which is very inadequate in India. The study found that the entire economic impacts of irrigation development during 2011-2016, enabling a further 8,472 acres of irrigated production, amounted to \$200.83 million in output (sales) generating \$86.60 million in GDP contributions at market prices.

It protects from famine. It helps to cultivate superior crops with the water system as per need of the crops. Ultimately it helps in economic development. Irrigation water improves water conditions within the soil, increases the water content of plant fibers, dissolves nutrients & makes them available to plants.

According to Dr. Bright Singh, "Increase in agricultural production and therefore the increase within the per-capita income of the agricultural community, in conjunction with the industrialisation and urbanisation, cause an increased demand in industrial production." during this manner, agricultural sector helps promote economic process by securing as a supplement to industrial sector.

Conclusion

I concluded that indigenous irrigation facilities employed by the Indian farmers to reinforce agricultural development are a requirement for the economic development of a rustic. Even

developed countries lay emphasis on agricultural development, consistent with Muir, "Agriculture for progress is vital to supply food for growing non-agricultural labour force, raw materials for industrial production and saving and tax income to support development of the remainder of the economy, to earn exchange and to supply a growing marketplace for domestic manufactures." In other words, where per capita real income is low, emphasis is being laid on agriculture and other primary industries. It's seen that increased agricultural output and productivity tend to contribute substantially to an overall economic development of the country; it'll be rational and appropriate to put greater emphasis on further development of the agricultural sector.

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He has published 15 books, 34 research papers and reviews in national and international journals of repute. His academic contributions involve membership and chairmanship of Board of Studies of various institutes. He was also recipient of "Best teacher award", "Best NSS Programme Officers Award", "Senior Economists award" and "Eminent Academician award". Besides he served as NAAC Coordinator, IQAC Coordinator and Dean of Academics and Research in the college.



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