Cover Page

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PATTERN OF IRRIGATION IN SIWAN DISTRICT

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ABSTRACT: Irrigation is the artificial arrangement of water to the roots of the plants. Water is the cyclic resource but limits in quant. It has spatial and temporal variation. Hence it is not available to the plants everywhere and all the year round. The need of water to the plants also depends upon the characteristic of the soil, plants biological features, atmospheric and soil temperature etc. H.Y.V. seeds and use of chemical aggravates the necessity of water. With the modernisation in agriculture scientific management of the soils, multiple cropping and inter-cropping together enhance the quantity of water to the plant roots. Hence, it is pertinent to explore into various gamutes of water arrangement to the plants whether artificial or natural. But the natural availability of water cannot be depended upon. Hence, irrigation and its management meet a fresh look. The district of Siwan has sufficient surface and sub-surface water in its fertile flat area. It becomes curious to know the pattern of irrigation in the district. In this regard the data from various ministries have been used with the application of statistical and cartographic methods. Regional and systematic approaches have been applied. The paper is useful for the planning purposes.

Keywords: Irrigation, Intensity of Irrigation, Operational Holding, Alluvium, Command Area.

Introduction

Irrigation is the most important input required for the successful cultivation of HYV. It is in one form or another has been in vogue from time immemorial. For instance, in Egypt, it goes back to 4000 BC or beyond and in other parts of the world it is equally old and is described, often in great detail, in ancient literatures such as the Rigveda or the records of ancient travellers and trades. It developed in response to conditions of climate, and the same holds good today in many parts of the world. Irrigation is essential the artificial application of water to overcome deficiencies in rainfall for growing crops (Cantor, 1967). All the less used arable lands of the world, especially in India, are either too sandy or too dry for utilization.

Water being a life-giving agent to plants, assured water supply to them is a most. Water requirements of different types of plants vary markedly both in the tempored and spatial perspective. Most of this requirement is met by the moisture stored in soil. Few climatic regimes can replenish soil moisture sufficiently to promote plant growth after accounting for potential evapotranspiration (Sher Singh Dhillon, 1973). Irrigation is a basic determinant of agriculture because its inadequencies are the most powerful constraints on the increase of agricultural production, particularly in the dry farming regions.

Although there is evidence to prove that farmers who are provide with irrigation facilities can innovate quaickly, there is known to show the pattern followed by dry farmers (Harvis, 1972). Output from a particular pience of arable land can be stepped up with the help of irrigation because it increases the possibility of multiplicity in cropping and of securing high yields per unit area.

On the whole, the development aspects of irrigation are:

(A) Those pertaining to protective measures:
(i) to make up for the soil moisture deficits.
(ii) to ensure a proper and sustained growth of crops, and
(iii) to make harvest safe.

(B) Those who pertaining to land utilization –
(i) to colonize the culitivable wasteland for horizontal expansion of cultivation
(ii) To shift from Seasonal cultivation and to promote more intension cultivation
(iii) to improve the level of agricutlural productivity by acting as a catalytic agent for the adoption of modern farm technology, and
(iv) to lessen the regional and size class inequalities in agricultural productivity which in turn will reduce socio-economic imbalances.

In the dry lands of the tropics and sub-tropics dry farming is possible, given an annual rainfall of 50 to 75 c.m. Agriculture is precarious and production mearge where rainfall ranges between 30 and 50 cm. Farming without irrigation is very limited and if the rainfall decreases to less than 30 cm, agriculture becomes impossible without irrigation (King, 1953). Rainfall is deficient in many agricultural areas of the world. When its distribution is unequal in spatio-temporal terms and soil moisture deficit persists, irrigation

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becomes indispensable for efficient utilization of existing land and for increasing food resources. Water is one of the primary bases of farming therefore, the rain which fall in abundance in the catchment areas and the snow which melts in the mountains should not be allowed to drain into the sea without being utilized by the peasantry in areas with scanty and highly unreliable rainfall. This is particularly applicable to many parts India.

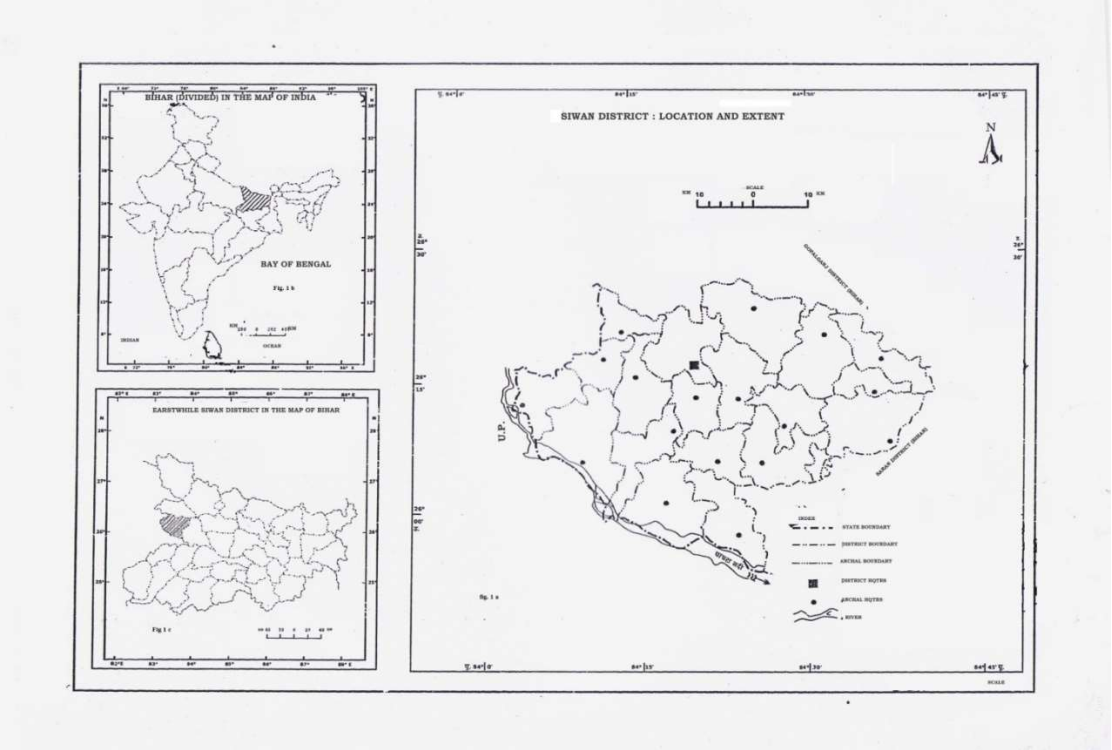

Figure 1 (a), 1 (b), 1 (c)

Objectives: This research paper is an attempt to meet the following objectives

(i) To highlight the nee of relation in Siwan district.
(ii) To show the means of relations in the study area.
(iii) To depict the pattern of relation in the district.
(iv) To compare the spatial variation in the intensity of relation in the district.
(v) To suggest the copy pattern in the district.

Sources of data: In this research paper the data have been collected from the district census hand book of Siwan district. Further on, irrigation data furnished by the ministry of irrigation government of Bihar have been used. Besides the useful data from the department of agriculture have been used.

Methodology: In this study the secondary data have been processed. Quantative methods have been applied where ever necessary. Cartographic techniques are in use to show the visual impression of the fact related to the relation in the district.

Discussion: In regions where rainfall is inadequate irrigation is needed. Cultivation is carried on with the help of irrigation. It should be noted that irrigation is a mixed blessing. Its misuse (excessive irrigation without proper drainage) leads to land degradation, but its proper use with good drainage leads to the growth of crops.

Sources of Irrigation

The irrigation in the region is of two types:

1. The surface irrigation and 2. The lift irrigation. The surface irrigation receives water from the canals and tank. The lift irrigation gets its major supply from the wells and tube wells. The choice to either of these sources is primarily guided by the surface

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(site, slope and soil) and the sub-surface (Depth of water-Table) conditions of the plain and secondarily by the size of operational holdings.

2. The well irrigation continued to be the most important sources of irrigation till 1960-61. On account of an innovation in the bore well engineering, the well at present, provide irrigation only 23.02 percent of the total irrigated land and hence has declined to the second position after the tube well. The decline became rather more conspicuous after the drought of 1966-67. Likewise, a diminution in the contribution of tank and other sources is evident from table 1. The tube-well on the other had has gained much by covering a larger area after the drought.

Table – 1: Area Irrigated by different Sources 1915-20, 1960-61 & 2016-17

Sources	As Percentage of the total irrigated Land		
	1915-20	**1960-61**	**2016-17**
Well	63.59	66.75	23.02
Canal	9.73	0.60	9.20
Tube Well	--	13.95	51.19
Tanks &Other	26.68	18.70	16.59
Total	**100.00**	**100.00**	**100.00**

Source: Figure of 1915-20 and 1960-61 from "An agricultural geography of Saran plain by Sinha, S. B. (1986), B. U., Muzaffarpur and of 2016-17 from Zeanswar of Siwan district.

Well Irrigation

The well irrigation is a product of the personal initiative of the individual. The masonry wells are mostly privately owned and a few of them are government owned also. The lifting of water from the well is practiced either through a machine, man or animal. The latter two means of lifting water use indigenous contrivances. Recently, the diesel engines have become popular.

The well contributes to only 10 to 20 and 20 to 30 percent of the gross irrigated land in the Siwan district. Here, it is a popular source of irrigation owing to deeper water-table. Irrigation from deeper wells is an uneconomic venture. In addition, the recurring floods along Ghaghara river interfluves frequently submerges the wells and silts them up. So its contribution to the total irrigated land is a little over 23%.

The well irrigation has both merits and demerits. Occasionl failure of electrictity and the lean supply of diesel create critical situation during the peak hours of irrigation. So, the well alone can save the crops from devastation. The well on the small farms is more common and useful. There it can be used more intensively with the labour available in the families of the marginal and the submarginal farmers. But the well fails to serve to the large farms and to suffice the requirements of the water loving plants (Rice and Sugarcane).

Tube-well irrigation

The tube well irrigation is a recent innovation in the farming of the district. It is cheaper as well as speedier among the sources of irrigation. Even a deeper water table is not an impediment to its use and operation. It is equally suitable to all sizes of the operational land holdings. It allows intensive cultivation on account of its greater water discharging capacity.

The tube well commands wide spread popularity in the Siwan district. Its areal average of the total irrigated land has gone up as above as over 50 percent. Its coverage even up to 80% is not an exception in Siwan district. Most of such pocket are protected from flood. The size of operational land holding in these anchals is comparatively larger. But the tube well contributes to only 40 percent or less of the total irrigated land in these anchals which are severely affected by flood as along Ghaghara River.

The increasing dominance of the tube well is more closely associated with the new technology of the farming. The diffusion of HYV seeds seems to be the main motivating factors for the adoption of the tube well engineering in the farming (Moorti and Mellor, 1972).

TANK IRRIGATION

The tank as a source of irrigation is equally old as the well. The lifting of water from tanks is performed either by manual force or by mechanical power. The use of the latter is becoming increasingly popular. The use of the latter is becoming increasingly

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popular. Recently, the tank irrigation is losing its prominence. In a large number of the anchals its contribution to the total irrigated land is less than 10 percent. The corresponding percentage gradually increases towards the Ghaghara banks. The depression carved out by the river are numerous in the area.

The tank irrigation in Siwan district implies the use of water for irrigation from a variety of sources such as pool, nalas, garha, pond etc. Water in these ditches is stored during rainy season brought under use mainly in the following seasons. Generally during winter season from those sources, the irrigation of lift type and lifted mainly by pumping sets, dekul etc are used.

Here it is clear that in only Maharajganj anchal is contribution of total irrigated land is 10-20 percent. In remaining all the anchals the contribution of tank is under 10 percent of gross irrigated land. It is further evident that its contribution to total irrigated in two of the anchals except Pachrukhi has same contribution as percentage of gross irrigated land 2001 as in 1981.

CANAL IRRIGATION (Fig. 2)

The flow irrigation is truly represented by the canal of Gandak project in Siwan district. The flow has natural advantage of the gentle slope and the smooth surface. The soft alluvium makes the digging of canals easier. It is cheaper than all other sources of irrigation provided water is regularly released in the canals and it is easily available on the agricultural fields. The percentage of the land irrigated by canal is still meager in a large number of the anchals. The canal water reaches to only a few of the anchals which are situated in the heart of the Gandak Command Area.

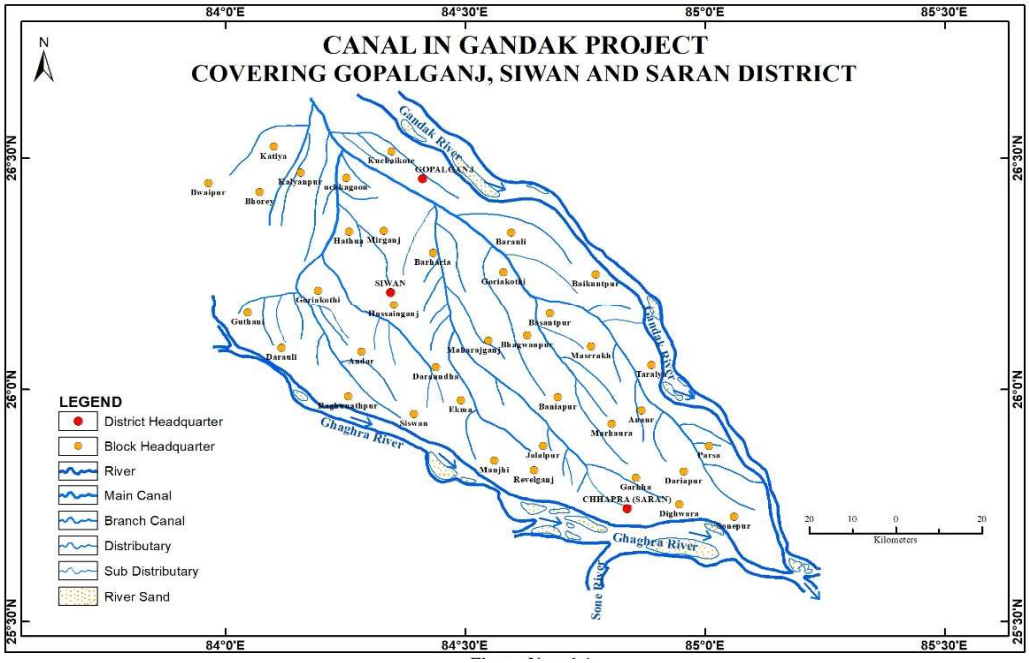
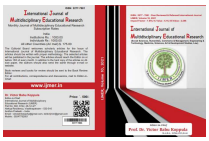


Figure 2

It appears that after the completion of the branch canals and the channels of Saran canal system, Fig. 2. The contribution of canal to the irrigation as percentage of the total irrigated land has considerably.

OVER ALL INTENSITY OF IRRIGATION

The area irrigated as percentage of the total cropped land refers to the overall intensity of irrigation. The intensity of irrigation ranging over 60 percent is recorded in Siwan followed by a large number of the anchals (Hussainganj, Darauli, Goreakothi, Daraunda, Maharajganj and Raghunathpur), all being 50 and 60 percent. The next higher intensity of 40 to 50 has been worked out for the remaining anchals.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Conclusion

From the above discussion it is evident that tube well irrigation is pre-dominant in the district of Siwan. It is followed by wells, tanks and canals. The modernation of agriculture and the practice of agriculture technology have together made irrigation a necessity for the area. That is why all the development blocks are competing with one another in the use of agriculture inputs and in the demand of irrigational facility. The Gandak Command area project has played an important role in the spread of the irrigational network in the study area.

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