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ASSESSING THE DIFFERENT SOURCES OF IRRIGATION IN HASSAN DISTRICT

Shivaprasad B.M.*

Prof. K. V. Aiahanna**

Abstract: *The transformation in the cropping pattern of agriculture in Hassan district has been from extensive to intensive use of land owes largely to the extension of irrigational facilities. Prior to irrigation, the district was facing rainfall vagaries since the last few decades. The changes owe a great deal to variety of infrastructural developments and increase inputs in general and extensive and intensive irrigational role in particular. The current research attempts to study the Different Sources of Irrigation in Hassan District. Hassan district has different sources of such as, irrigation well, canal, lift, tube well irrigation & others. Important crops are Maize, Potato, Sugar cane, Horticultural and Paddy account for a major share of cropping of land under cultivation in the district. With the advent of irrigation, the shares of commercial crops have increased in total cultivated area of the district. The traditional subsistence agricultural structure of the study region appears to collapse or is in the process of transformation into market oriented, semi-commercialized pattern.*

Keywords: *Irrigation, Agriculture, Transformation, Cropping Pattern*

*Research Scholar & Project Fellow, UGC-UPE

**Institute of Development Studies, Leela vihar, Manasagangotri, University of Mysore, Mysore.

INTRODUCTION:

Agriculture sector is the mainstay of the Indian economy, contributing about 13.7 per cent of national Gross Domestic Product (GDP) and more importantly, about half of India's population is significantly dependent on agriculture and allied activities for their livelihood (Economic Survey, 2014). Irrigation is one of the key factors in agricultural development and its impact on cropping pattern. The importance of water has been recognized from primitive days. The largest use of water in the world is for irrigating lands, as an agricultural input, especially for the production of food grains. Irrigation development in the past has mostly taken place as a measure of famine, which gave birth to the idea of artificial irrigation. Now with the population multiplying rapidly irrigation has assumed greatest importance for augmenting agricultural production. The importance of irrigation may be viewed from two aspects Protective aspect; to make up the moisture deficiency in soils, during the cropping season so as to ensure proper and sustained growth of crops grown. Additional land use aspect to enable second or third crop being raised on the lands provided with irrigation on which could otherwise not be cultivated efficiently, more particularly during the post or pre monsoon period. While the protective aspect helps in stabilizing agricultural production against droughts, the second aspect cannot be neglected by a watchful agriculrist, irrigation has also a third aspect it helps in augmenting and preserving the properties of soils by application of adequate supply of water.

Irrigation studies in India are confined to relatively narrow issues in production economics. It is obvious that, viewed as an input rural development not merely agricultural production, irrigation has other points of contact with development economics as the irrigation in Indian rural economy begins to move from the wings towards the centre of the stage. Wide distribution of the irrigation water implies a strategy of dispersing the development thrust of irrigation; it has to treat irrigation as only a component in a broader design for Agricultural and Rural Development. The role of irrigation in expanding crop output, in reducing output instability and in providing considerable protection to the farm sector against periodic drought. The benefits of irrigation have resulted in higher production resulting in lower food prices, higher employment and a more rapid agricultural and economic development. So, irrigation in a rural economy or in any economy works like a cycle where one is connected to the other.

Irrigation becomes a prerequisite for rising second and third crop in a year and influences. Irrigation thus provides a cropping pattern by reducing the risk of crop failure and providing water security. This enhances the agricultural production and may have an input on food consumption basket, life quality and socio-economic status of command area farmers. Irrigation farming is another way of improving agricultural production both in subsistence and commercial farming. Large scale irrigation schemes comparatively are more profitable and have socio-economic advantages than small ones. Canals are the most important means of irrigation in the country. Some canals were constructed by the early Hindu and Mohammedan kings. Most of the canals, however, are the product of the British rule. At present, canals irrigate about 39 percent of total irrigated area of India.

DEVELOPMENT OF IRRIGATION IN INDIA

Irrigation is generally defined as the application of water to the land for the purpose of supplying moisture essential to plant growth. In the process, irrigation projects can transform land in two ways. By direct modifications of the land surface that occur when canal networks are constructed and land is cleared, shaped and leveled for irrigation; & by indirect in-depth transformations that take place when the water and salt balances in the region are changed following the import of additional quantities of water and salt into the area. Irrigated lands contribute significantly to the world agriculture output and food supply. Irrigation has contributed significantly to poverty reduction, food security, and improving the Quality of life for rural populations.

IRRIGATION POTENTIAL AND ITS PROMPT USE

The term Irrigation potential created and utilized has been defined by The Planning Commission of India. In terms of the engineering works needed to irrigate any area. The term irrigation potential created by a project refers to the aggregate gross area that can be irrigated annually by the quantity of water that could be made available, by all the connected and completed works up to the end of water courses or the last point in the water delivery system up to which the government is responsible for construction.

IRRIGATION POTENTIAL

Expansion of irrigation facilities, along with consolidation of the existing systems has been the main part of the core strategy for increasing production of food with sustain and

systematic development of irrigation grains. The irrigation potential through major, medium and minor irrigation projects has increased from 22.6 million hectares (Mha) in 1951 when the process of planning began in India to about 102.77mha at the end of tenth plan. Plan-wise irrigation potential created and utilized through major, medium and minor irrigation projects in the country.

REVIEW OF LITERATURE

Thakur and Associates (2000) assessed the impact of irrigation on production and economic level of farmers. Study was conducted in command area flow irrigation scheme of Hurla in Kullu district of Himachal Pradesh. The data for the study were collected before and after construction of the project. Results show that per cent increase in the seed rate for various crops ranged between 1.18 to 53.09 before & after project installation respectively. Also increase in the per cent application of FYM ranged between 1.59 to 120.02. The average number of total livestock possessed by the sample farms had increased by about 125 per cent after the project. About 60 per cent change in household earning was observed after the installation of the project.

Dr. Rajendra Poddar (2007), studied the impact of Performance Evaluation Of Minor Lift Irrigation Schemes (MLIS) in Northern Karnataka. Objectives of the investigation were estimation of growth of MLIS in terms of numbers and area irrigated and financial feasibility. Major findings of the study are – Growth rate of Government MLIS increased during 1990-2005 at a compound rate of 1.40 per cent. In the erstwhile Bijapur district, about 61 percent of MLIS were non-working. With respect to the performance of MLIS in terms of expected and actual irrigation only 31.65 per cent of the expected area was under irrigation, which reflected upon irrigation inefficiency. At 12 percent rate of discount, NPV was Rs. 10, 94, 18,283; BC ratio was 1.57; IRR was 70.5 per cent. Based on these it was concluded that investments made in the MLIS were economically feasible. Constraints like scarcity of water, electricity and input supply and water charges fell in the severe category.

Navaneeth B. (2007) In His Study Performance of 'Minor Irrigation in Krishna Basin of Karnataka- An Economic perspective' stressed that Minor irrigation is gradually becoming more important because of several advantages like small investment, simple components, quicker rewards and easier management. Present study was conducted with the objective of documenting the temporal growth in irrigated area investment, potential created, utilization

identifying the constraints and evaluating the performance of minor irrigation schemes in Krishna basin of Karnataka. The study shows that, there is a constant increase in Minor Irrigation Schemes leading to the increase in potential thereby enhancing the crop output. Small farmers formed a majority of beneficiaries reflecting upon social equity dimension. Encroachment and siltation of tank bed, poor maintenance and inadequate power supply, declining rainfall, inadequate funds and lack of institutional support were identified as major constraints for minor irrigation development in basin through the study. The researcher suggests construction of farmer managed minor irrigation schemes with participatory approach.

Savita (2008) - The study entitled 'Impact of community based tank management project on socio-economic status of beneficiary farmers in Bidar district' was carried out during 2007-08. Totally 150 respondents were selected by random sampling method from ten villages and data were collected by personal interview method. The results of the study revealed that, the community based tank management project has resulted in significant increase in socio-economic status ; 'agriculture occupation' from 90.66 to 97.34%, 'Business' from 14.0 to 26.0%, 'owning of two houses' increased from zero to 10.66 per cent, in case 'type of house' 'tiled roofed house' increased from 44.0 to 56.0 per cent and in case of 'concrete house' increased from 1.34 to 4.66%. There was increase in medium land holding from 33.34 to 40.67%, source of irrigation from 'wells' increased from 23.34 to 42.0%. Further, there was increase in medium level of participation from 16.0 to 47.34%. The shows the positive impact of tank based management by increasing ; land productivity thereby increase in annual income resulting in better education, organizational participation, risk orientation, achievement motivation, innovativeness. Therefore, the study revealed positive impact on its beneficiaries and hence, the financial assistance may be coupled with technical guidance for increasing the standard of living of rural people.

RESEARCH GAP

After much deliberations and outcomes, still there looms problem of inter-state water disputes, shortage of rain water. In this regard, government has been implementing various irrigation development programmes in rain fed areas. In this connection several studies have been conducted in different irrigation projects in the state in connection with the contribution made by irrigation development in agriculture. However, there are no other

studies on the "Assessing the Different Sources of Irrigation in Hassan District" conducted at the district level. In this view, there is a need for this kind of research at district level, which would be very useful for changing or increase agriculture development and also increase the potentiality of irrigation development in that particular district.

OBJECTIVES OF THE PAPER

i) To review the Different Source of Irrigation Water in Hassan district

METHODOLOGY

The work is based on secondary source of data. The data is been collected and used for the period of 2010-2011 to 2012-2013. The secondary data is obtained from Socio-Economic Review, District at a Glance of Hassan District and Irrigation Department of Hassan District. The collected data have been compiled and analyzed to draw the inferences.

PROFILE OF THE STUDY AREA

Hassan district is located in the south-western portion of Karnataka state and is surrounded by many as seven districts. It is of an irregular shape and is bounded on the north-west and North by Chikkamagalur district, on the east and south-east by the district of Tumkur and Mandya, on the south and south-west by the districts of Mysore and Kodagu, and on the west by Dakshina Kannada district. The district spreads across a geographical area of 6814 sq.km and lies between the latitudinal parallels of $12^0$31 'N and $13^0$33 'N and longitudinal parallels of $75^0$33 'E and $76^0$38 'E. The greatest length of the district from North to South is about 80 miles or 129 kms and its greatest breadth from east to west is about 72 miles or 116 km. Hassan district consists of eight taluks namely, Alur, Arkalagud, Channarayapatna, Hassan, Holenarasipura, Arsikere, Belur & Sakleshpura.

From the point of view of natural division, Hassan district lies partly in the southern Malnad region and partly in the southern Maidan region of the state. It also contains a transaction zone termed as semi Malnad region. The Maidan is much larger in extent than the other two which has all along been reckoned as Malnad district of the state. The semi-Malnad zone consists of the central part of Arkalagud taluk, the western portion of Alur taluk and the eastern portion of Alur taluk and the Holenarasipura and Channarayapatnna as well as the east and southern east part of the taluk of Arasikere, Malnad is a forest hilly region which is characterized by a heavy rainfall. The Southern maidan is bounded by 650 meters contour and is characterized by a higher degree of slope. As per the 2011 census the population of

Hassan district is 17, 21,669. Out of which 14, 16,996 is the rural population and 3,04,673 is urban population. The percentage of rural and urban population to the total population of the district is 82.31 and 17.69 respectively.

ANALYSIS & DISCUSSION

Presently Hassan district has different sources of irrigation where, the canal and well irrigation are in a significant position in the district's overall irrigation scenario. In the years 2010-2011, the area irrigated by canal was about 44,874 hectares. The total area irrigated by canal has decreased by 8977 hectares during the period of investigation. The reason for decline in area irrigated may be connected to the large scale non - cropping of agricultural among many other reason that contribute to the turn down. Concentrations of well irrigation in Channarayapatna, Arasikere and Hassan have been decrease because of urbanization. Well irrigation contributes around 35 % to 40 % in above mentioned three taluks. Canal irrigation is more than 40 % to total area irrigated in Alur, Arkalgud, Holenarasipura and Channarayapatna whereas, it is not yet so, developed in Belur and Sakleshpura. The percentage of canal irrigation is also medium in Alur and Hassan tahsils. There is a conspicuous decline in the canal irrigated area due to vagaries of monsoon during last few decades. Heavy irrigation-input through available mechanical-technical know-how has helped a great deal in maintaining the desired agricultural production balance though at a much higher cost.

Table- 1. Area irrigated by different sources in Hassan district (Area in hectares) 2010-2011

Sl.No	Name of the Taluks	Canal	Tanks	Wells	Tube Wells	Lift Irrigations	Others	Net area Irrigated
1	Alur	2240	5010	46	1960	-----	290	9546
2	Arkalgud	9600	2547	33	2600	-----	190	14970
3	Arsikere	-------	2600	-----	9108	-----	-----	11708
4	Belur	2300	3570	220	3647	-----	375	10112
5	C.R. Patna	9044	2300	30	9000	-----	----	20374
6	Hassan	9500	7000	40	11708	-----	-----	28248
7	H.N. Pura	7999	3000	50	2050	125	-----	13099
8	Sakleshpura	-----	5444	506	300	----	785	7035
	District Total	44874	31471	925	40373	125	1640	115092

Source: ASCR Hassan

Above table shows the actual irrigated area through different sources of irrigation. 2010-11 net irrigated area was 1,15,092 hectares including through all sources. Here Arkalgud,

Channarayapatna and Hassan have major share and is benefited the most . On the other hand, Arasikere and Belur did not have irrigation facilities during the period of study. The reason being, no well established canals as compared to other areas during course of the study.

Table- 2. Sources of Irrigation in Hassan district (Area Hectares in Percentage) 2010-2011.

Sl.No	Sources of Irrigation	Net Irrigated Area in Hectares	Percentage of Net Irrigated Area
1	Canal	44874	37.5
2	Tanks	31471	26.35
3	Wells	925	0.77
4	Tube Wells	40373	33.81
5	Lift Irrigation	125	0.10
6	Other Sources	1640	1.37
7	District Total	119408	100.00

Source: ASCR Hassan

The table indicates the percentage of net irrigated area in the district. Canal and tube well accounts for major source of agriculture. Canal irrigation contributes 37.5% and tube well concentrates 33.81%, lift irrigation and well irrigation were very low. With the advent of irrigation it can be said that, the irrigated area has increased which majorly depends on canals.

Table- 3. Area irrigated by different sources in Hassan district (Area in hectares) 2012-2013

Sl.No	Name of the Taluks	Canal	Tanks	Wells	Tube Wells	Lift Irrigations	Others	Net area Irrigated
1	Alur	2315	2035	51	510	195	184	5106
2	Arkalgud	12583	3825	72	1235	0	116	17715
3	Arsikere	0	3217	0	10239	0	0	13456
4	Belur	984	4310	282	3212	47	174	8835
5	C.R. Patna	7945	3410	108	10625	0	0	22088
6	Hassan	1398	2420	52	8220	220	0	12310
7	H.N. Pura	10672	1863	44	724	627	0	13930
8	Sakleshpura	0	838	0	310	0	115	1148
	District Total	35897	21918	609	35075	1089	589	94588

Source: ASCR Hassan

Table 3 reflects the actual irrigated area through different sources of irrigation. During 2012-2013, net irrigated area was 94,588 hectares when compare to 2010, there is a difference in irrigated area which has seen a reduction. Here, canal irrigation provides the water to 35,897 hectares and tube well provides 35,075 hectares. The decreasing in net irrigated area

is result of under utilization of farming area. Where, the farmers either have shifted cropping pattern to commercial crop with not much success or would have turned the farming land into commercials plots thus, decreasing the area of farming.

Table- 4. Sources of Irrigation in Hassan district (Area Hectares in Percentage) 2012-2013.

Sl.No	Sources of Irrigation	Net Irrigated Area in Hectares	Percentage of Net Irrigated Area
1	Canal	35897	37.71
2	Tanks	21918	23.02
3	Wells	609	0.63
4	Tube Wells	35075	36.85
5	Lift Irrigation	1089	1.14
6	Other Sources	589	0.61
7	District Total	95177	100.00

Source: ASCR Hassan

Table 4 reveals the total percentage of net irrigated area in the district, which is the major source of irrigation, here canal contributes 37.71% and tube well concentrates 36.85%, when it comes to lift and other source, irrigation accounts very low percentage of irrigated area.

In the year 2010-2011 Hassan district has a net irrigated area of 1, 19,408 when compare to 2012-2013 where, net irrigated area was 95,177. There has been a decrease of 24231 hectares. Percentage of irrigation sources have also decreased due to irregularity of Monsoon. Overall, the net sown area have been decreasing since last decade because of urbanization and many other major problems related to agricultural sector. The cropping pattern of the district has seen changes from time to time. durning 1990's cropping pattern of the district was majorly non irrigated crops , whereas, after 2000 district economic and irrigation pattern changed because of intervention of major and minor irrigation in the area. Now, the district is growing semi – aired and aired crops. Though in last decade there seems a decrease in irrigated area but when we take into account the larger picture there is an increase in net irrigated area. In this region canal and tube well irrigation play major source of irrigation for agriculture sector. Most of the lands covered by canal are through Hemavathi, Yagachi, Hotehole and Kaveri where water drawn from these rivers are distributed via canals.

CONCLUSION:

Development of irrigation will help in upliftment of the farmers but also benefit the larger section of the rural poor who are directly engage in agriculture or indirectly linked with agriculture as consumers. Efficient way of production, stabilized prices, higher income from agriculture would create a more conjugative environment in the country for the development of the economy as a whole and of rural population in particular. Irrigation sustainability is another key issue. This needs to be addressed by overseeing proper distribution of water resource through well connected canals & tanks where, neither there should be shortage nor overflow of water. Empowerment of the small and marginal farmers through education, reforms and development will ensure a better, efficient and strengthened irrigation agriculture system. Innovation of new models in irrigation along with creating awareness and imparting education to farmers will help in development of the sector and more importantly improving the economic status of poor farmers. It is in this direction that research is needed to increase productivity through irrigation and water management.

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