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IMPACT OF IRRIGATION ON AGRICULTURAL DEVELOPMENT IN YADGIR DISTRICT OF KARNATAKA STATE

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ABSTRACT:

Irrigation is very important input of agriculture and most of the successful green revolution areas in India also concede with high irrigation intensity areas, since adequate and timely moisture supply is a sine-qua-non in the new agriculture its success is linked very closely with the development of irrigation. The problem of low agricultural productivity can be tackled by improving farm facility irrigational facilities. Differences in the provisions of irrigation facilities account for a substantial amount of variation in agricultural output between regions. If constant supply of water is ensured transformation and expansion of agriculture can take place. Without irrigation very little can be expected from extensive cultivation. Besides, irrigation helps greatly in raising the yield of land. In the foregoing analysis an evaluation of the aspects of irrigation in Yadgir district, has been made in detail in order to understand the role and impact of irrigation in the development of agriculture and its efficiency.

Key words: Irrigation, Effect, Agriculture, Intensity of Irrigation

Introduction:

Irrigation is an age old art. Historically, civilizations have followed the development of irrigation. Most men who are well-informed of irrigation are certain of its perpetuity, as it is intelligently practiced. Others think that a civilization based on agriculture under irrigation is destined to declined sooner are later with disappearance of water resources. Civilizations have evolved on irrigated lands; they have also decayed and disintegrated in irrigated regions. Most ancient cultures depending upon irrigated agriculture declined because of the lack of political and community stability, essential to sustain agriculture. The duration of civilization depend on many factors, of which permanently profitable agriculture is vitally important.

Some of the principles and practices essential for permanent and profitable agriculture under irrigation have been considered in this paper.

Agriculture without irrigation in areas having less than fifteen centimeters rainfall, is a suicidal uneconomic venture. The increasing demand of water for agriculture may be met by intensive and extensive use of the available water resources. Thus, one of the major purposes of enquiry of the available water resources is to define the regional pattern of their quality, quantity and utilization. In fact there are three sources of water available to men i.e. surface water, ground water and ocean water. Thus, the surface water in the form of rivers, streams, and lakes are the most important sources to be used for irrigation purpose. The uses of irrigation are conditioned by several variables. "While low rain fall and its variable nature necessities the development of artificial means of moisture supply, the increasing use of fertilizers and to some extent of improved variety of seed make timely needs of water prerequisite."

There is little wonder that, most of the successful green revolution are as in India are of the high intensity irrigation, adequate and timely moisture supply is a sin-qua-non in the new agriculture and its success is linked closely with the development of irrigation. The problem of low agricultural productivity can be tackled by improving farm facilities and irrigation facilities. Irrigation disparity accounts for a substantial amount of variation in agricultural output between regions. If constant supply of water is ensured, transformation and expansion of agriculture can take place. Without irrigation very little can be expected from extensive cultivation. Besides, irrigation helps greatly in raising the yield of land. Besides this enables the application of other modern inputs like fertilizers, high yielding varieties of seeds and other insecticides and pesticides. This aspect is of more significant in case of Yadgir district.

In the foregoing analysis, an evaluation of the aspects of irrigation in Yadgir district has been made in detail, in order to understand the role and impact of irrigation in the development of agriculture.

Study area:

Yadgir is located in the North east part of the State surrounded by Kalaburgi in the North, Raichur in the South, Vijayapura in the West and Heddal of AP in the East. This district was carved out from the erstwhile Kalaburgi district as the 30th district of Karnataka on 31st Dec 2010. It is spread across 3 Taluks namely Shahapur, Shorapur and Yadgir. Yadgir is the district headquarter and it is 530 km away from Bengaluru. The total Gross District Domestic Product (GDDP) of the district estimated during the year 2012-13 is Rs.2,347 crore. In the year 2019-20, the per capita annual income of the district was Rs. 38,097. Net sown area is 87.00 per cent of the total cultivable land area, which is 13821.94 square kilometers. Shahapur and Shorapur both the taluks have been completely irrigated whereas, Yadgir taluk has 65.00 per cent of irrigated area. Cattle, Poultry, Sheep, Goats and Buffaloes constitute the major livestock of the district. Vast stretch of fertile black cotton soil is present in the district.

As per the 2011 census the total population of the district is 1174271, out of which 590329 male and 583942 is the female population, while 45.02% of rural and 54.97% urban population, the density of the population of Yadgir district is 190 persons/per sq km. The literacy rate in Yadgir district is 32.48%, while sex ratio is 891 females per 1000 males. The district is a place for people belonging to various religions like Hinduism, Islam, Jainism and Christianity. The study area is distributed in two important rivers viz.

Krishna and Bhima These two tributaries drain about 27 per cent of the total area under study, and play an important role in the irrigation facilities of the area. On the agricultural front, the presence of black soil helps in raising crops like cotton, wheat, ragi, jowar and oilseeds and that of red soil is more suitable for paddy.

Objectives:

1. The main aim of the study has been to portray the spatial and temporal distribution of irrigation and its impact on taluka wise development agriculture in the study area.
2. To locate the areas logging in irrigation facilities and the causes thereof

Methodology and Data Base:

Secondary data has been collected for the district, for the year 2009-10 and 2018-19. Simple techniques have been used to analyzed secondary data and based on the results, maps and diagrams are shown.

Discussion:

In Yadgir district, the irrigation varies from one taluk to another. As per the figure made available by Bureau of Economics and Statistics, the district has a Geographical area of 5,16,088 hectares. The increase in net irrigated area over a decade is not uniform in all the taluks of the district have increased their land under irrigation. However, the increase in the net irrigated area in the district is a positive feature for the agricultural development.

Canal Irrigation:

Canal is the major irrigation system in the district (Table 1). During 2009-10 the area under canal irrigation was 151163 hectares (87.25%) which reduced to 144585 hectares (80.46%) in 2018-19. The net decrease of area under canal irrigation is 6578 hectares (6.79%). The canals were not supplied water, which have a resulted in the decrease in area under canal irrigation.

Tank Irrigation:

In the year 2009-10, tank irrigation was 2520 hectares (1.45%) and this rose to 4974 hectares (2.77%) by 2018-19, the net increase of area under tank irrigation is 2454 hectares (1.32%), due to the rose up of tank development of irrigation by farmers.

Well Irrigation:

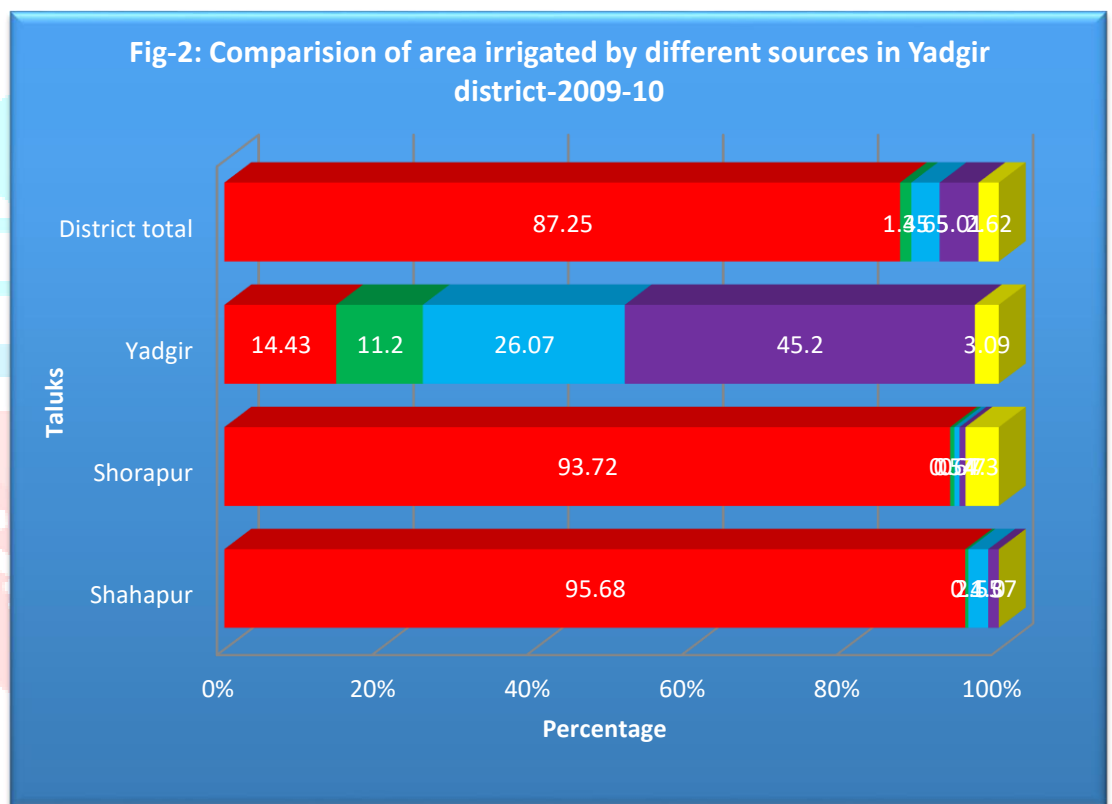
Well Irrigation is the negligible source of irrigation in the district, in 2009-10 the area under well irrigation was 6330 hectares (3.65%), but in 2018-19 the well irrigation was 12007 hectares (6.68%), the net increase of area under tank irrigation is 5677 hectares (3.03%), because sufficient of rain fall, the ground water table is goes on increasing. At present (i.e. 2018-19) the wells irrigation is also practiced by the farmers in the district.

Table - 1
AREA IRRIGATED BY DIFFERENT SOURCES IN YADGIR
DISTRICT-2009-2010

Area in hectares (In bracket indicates percentages to the district total)

Sl. No.	Taluk	Canal	Tanks	Wells	Tube-Wells	Others	Net-Area Irrigated
1	Shahapur	60375	252	1607	866	0	63100
		(95.68)	(0.40)	(2.55)	(1.37)	(0.00)	100.00
2	Shorapur	88523	510	632	727	4062	94454
		(93.72)	(0.54)	(0.67)	(0.77)	(4.30)	(100.00)
3	Yadgir	2265	1758	4091	7094	485	15693
		(14.43)	(11.20)	(26.07)	(45.20)	(3.09)	(100.00)
	District total	151163	2520	6330	8687	4547	173247
		(87.25)	(1.45)	(3.65)	(5.01)	(2.62)	(100.00)

Source -District at a Glance 2009-10



Tube Well Irrigation:

During 2009-10 the area under tube well irrigation was 8687 hectares (5.01%) which rises to 16615 hectares (9.25%) in 2018-19. The net increase of area under tube well irrigation is 7928 hectares (4.24%). This high figure is mainly due to extension of financial assistance to small and marginal farmers to make use of irrigation through tube wells.

Irrigation by Other Sources:

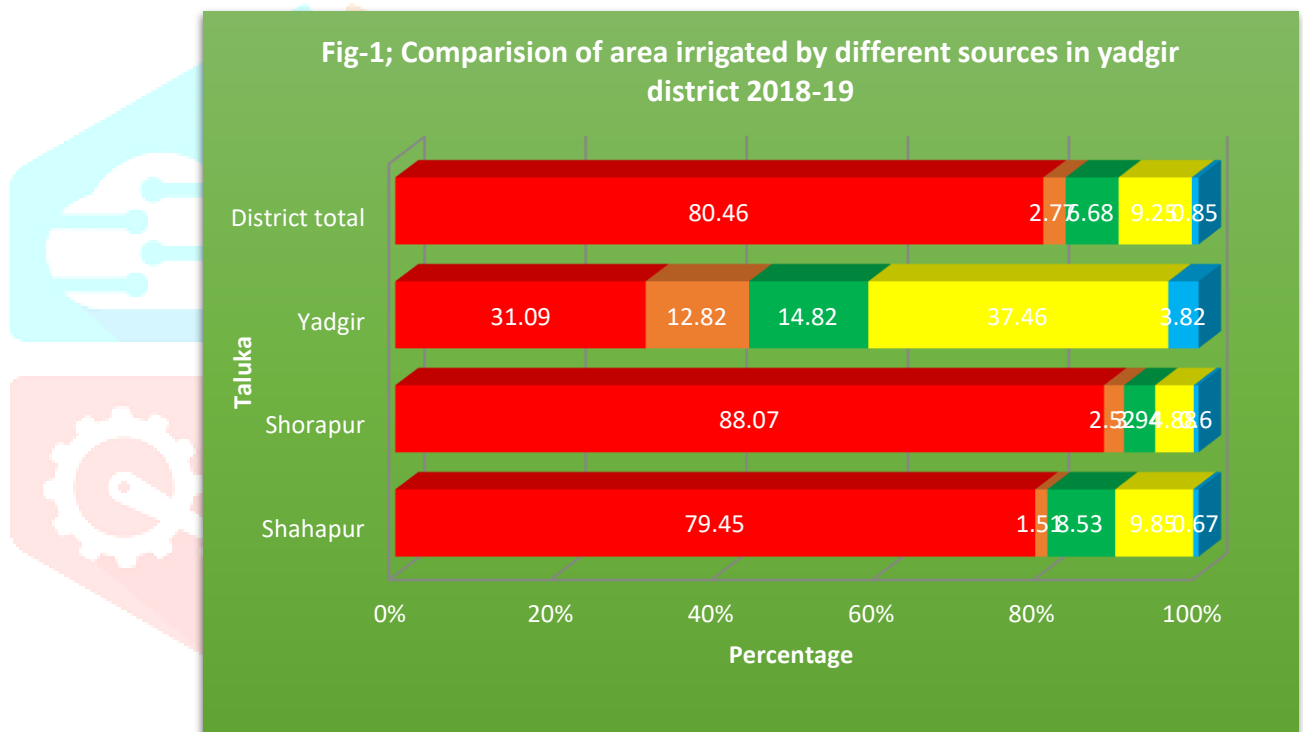
This type of irrigation sources includes lift irrigation, flood water and ground water used to irrigate agricultural lands. During 2009-10, Yadgir district had 4547 hectares (2.62%) of land under irrigation by other sources and in 2018-19; it is decreased to only 3028 hectares (1.77%). The farmers are not using this kind of irrigation systems during span ten years (Table 2)

Table - 2

AREA IRRIGATED BY DIFFERENT SOURCES IN YADGIR DISTRICT- 2018-19
Area in hectares (In bracket indicates percentages to the district total)

Sl. No.	Name of the Taluks	Canal	Tanks	Wells	Tube-Wells	Others	Net-Area Irrigated
1	Shahapur	62424	1183	6706	7739	523	78575
		(79.45)	(1.51)	(8.53)	(9.85)	(0.67)	(100)
2	Shorapur	78397	2239	3507	4341	534	89018
		(88.07)	(2.52)	(3.94)	(4.88)	(0.60)	(100)
3	Yadgir	3764	1552	1794	4535	462	12107
		(31.09)	(12.82)	(14.82)	(37.46)	(3.82)	(100)
	District total	144585	4974	12007	16615	1519	179700
		(80.46)	(2.77)	(6.68)	(9.25)	(0.85)	(100)

Source -District at a Glance 2018-2019



Intensity of Irrigation:

The intensity of irrigation is controlled by various factors such as source of irrigation, types of crops grown, cropping season, quantity and quality of water supply and density of network of water channels etc. The benefits of intensity of irrigation are reflected in the cropping pattern, productivity of land, land use efficiency and method of cultivation. In an agricultural region other things being equal, intensity of irrigation will increase with decrease of rainfall and vice-verse. The intensity of irrigation will always remain low and negligible in rain fed areas. The intensity of irrigation is worked out by using the following formula.

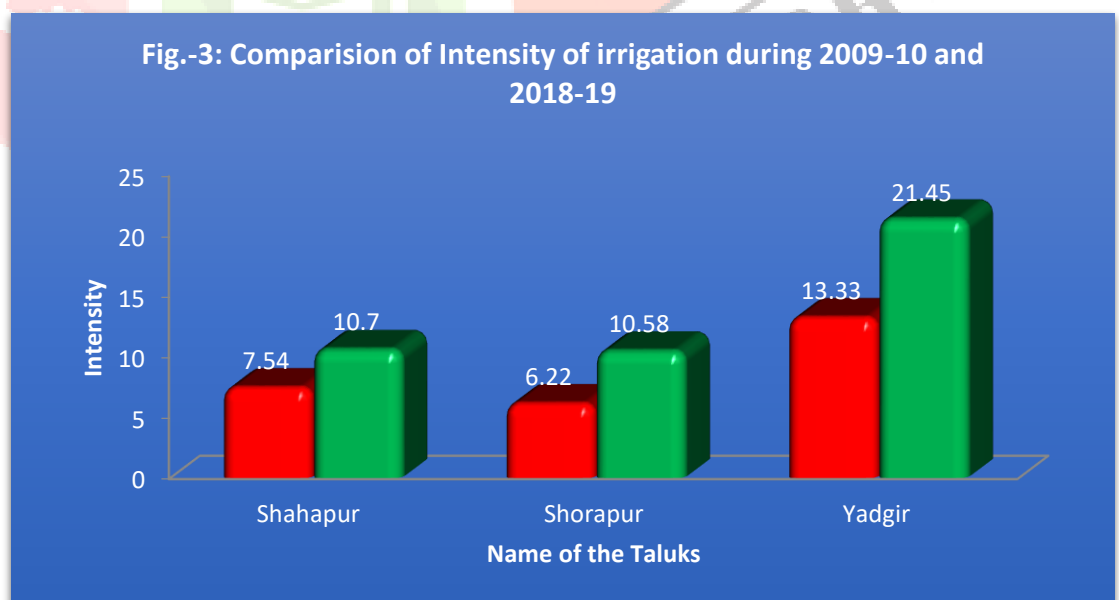
$$\text{Formula} = \frac{\text{Net irrigated Area}}{\text{Net sown Area}} \times 100$$

Table - 3

INTENSITY OF IRRIGATION DURING 1999-2000 AND 2009-10

Sl. No.	Name of the Taluks	2009-10	2018-19
1	Shahapur	7.54	10.7
2	Shorapur	6.22	10.58
3	Yadgir	13.33	21.45
	District Total	15.54	18.54

The intensity of irrigation refers to more and more use of water for the same piece of land to cultivate different types of crops or more number of crops in a year or an agricultural season. The areas, which are provided by assured water supply like river canals, may be thrusting to cultivate single crop like sugar cane which needs not less than a year period. In such situation, the intensity of irrigation does not arise. The intensity of irrigation therefore refers to cultivate more number of crops in a year such as rice, groundnut, Sunflower, etc., in such situation it is interesting to underline that these crops may consume less water than sugar cane cultivation while the total number of crops grown will add to more income of the farmer and it may be suitable to farmers for diversified needs than that of sugar cane cultivation. Therefore, the intensity of agriculture will support to farmers localized interest such as subsistence needs of food crops, animal needs like fodder, and use of animal products like dung for bio mass fertilizer production, milk production, meat production, leather of the animals etc., Therefore the high index of intensity of irrigation in a region can definitely show the agriculture development in an Indian context. The intensity of irrigation is not uniform in Yadgir district. The district as a whole intensity value was 15.54% in 2009-10 that increased to 18.54% in 2018-19. The net increase in the intensity of irrigation is 27.58% (Table 3).

**Suggestions and Conclusions:**

In view of the depleting water table from year to year it is very essential at this juncture to plan and implement the following measures to restore the water table and to conserve the groundwater potential for future exploitation.

- 1) De-silting of existing tanks to provide augmentation of recharge to ground water body.
- 2) Creating artificial recharge by the way of construction of natural ground water harvesting structures like, check dams, subsurface, dykes, gully, plugging etc. wherever possible.
- 3) Judicious utilization of ground water and its conservation for the future by the way of deployment of drip and sprinkler irrigation system.
- 4) Conjunction in the use of surface and ground water

Critical shortages of underground water due to limited natural recharge, small surface storage capacity, and over use have stimulated efforts to recharge ground water reservoirs with surface water. Thus, it provides water to seep into the underground reservoirs. Flow of streams, sewage and industrial water may also be utilized for recharging these reservoirs. Full conservation of available water supply requires and integrated use of surface and underground water and storage facilities.

Crops cultivation to a large extents and rearing livestock depend upon the resources of their immediate environment. Therefore, land owners and cultivators will have to select appropriate and adaptable crops to the existing physical environment. Since agriculture is directly related to physical environment variations, this in turn also affects agricultural land use. Thus, agriculture is not only an economic activity, but also a form of applied ecology. The crop production potentiality of an area always depends primarily on the prevailing climatic and soil conditions.

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