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IRRIGATION SYSTEM IN DAKSHINA KANNADA DISTRICT, KARNATAKA: AN OVERVIEW

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ABSTRACT: "While low rainfall 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 seeds make timely need of water as a prerequisite 'In the foregoing, analysis and evaluation of the aspects of irrigation in Dakshina Kannada district, has been made in detail in order to understand the role and impact of irrigation in development of agriculture and its efficiency. The study on irrigation paper certainly contributes to a greater extent to understanding the future course of probable change in land use of Dakshina Kannada district and there by arising needs for planning of agriculture in Dakshina Kannada district.

KEYWORDS*:* Irrigation, Intensity, HYV, Fertilizer.

INTRODUCTION

Irrigation is the basic input of agriculture and it is one of the important components of agriculture technology to boost up agricultural productivity. It is task of geographers to study the spatio-temporal aspects of irrigation and its relationship with other attributes. It is oblivious fact that irrigation is indispensable for the success of agriculture. It ensures that benefits to farms by reducing the risk of crop failure, increasing the average yield and permitting multiple cropping. The successfully water requirement of various crops can be met (Gadgil D.R. 1948). Supply of moisture in time and adequate quantity is the most important aspect to get maximum yield of a crop. Therefore, such success is linked with the development of irrigation. Water is among the most requisite that nature provides to sustain life for plants, animals and human beings. The total quality of fresh water on earth could satisfy all the needs of the human population, if it were evenly distributed and accessible. India has more than twenty percent of land in the world is irrigated land. It received about seventy five percent of rainfall during south-west monsoon; as such storage of water is imperative for assured irrigation.

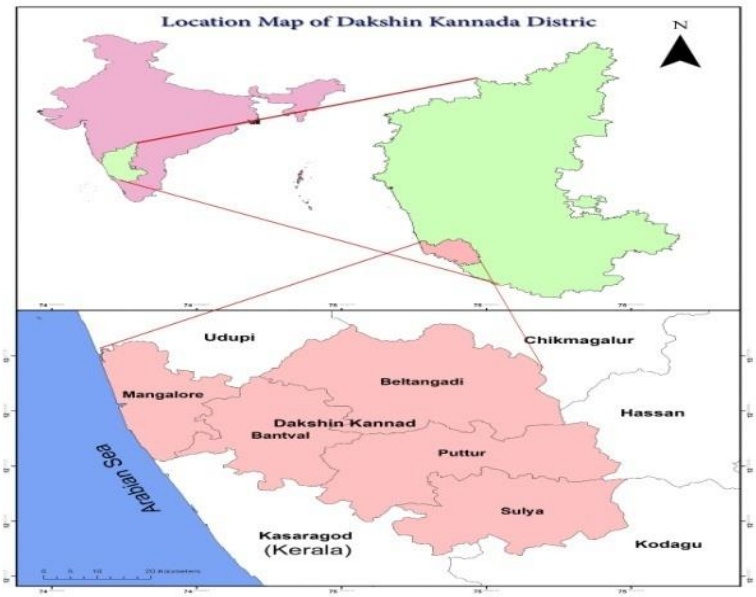
Irrigation is an age old art. Historically, civilization has followed the development of irrigation, civilization have risen on irrigated lands; they have also decayed and disintegrated in irrigated region most men who are well- informed on irrigation are certain of its perpetuity, as long as it is intelligently practices. Others think that a civilization based on agriculture under irrigation is destined sooner or later to decline, because some ancient civilization based on irrigation have declined. Most ancient cultures depending upon irrigated agriculture decline because of lack of political and community stability so, essential to irrigated agriculture. The duration of civilized people is probably dependent on many factors, of which a permanently profitable agriculture is vitally important. Some of the principals and practices essential to permanent and profitable agriculture under irrigation

are considered in this volume. Areas having less than fifteen centimeters rainfall, agriculture without irrigation is a suicidal uneconomic venture. The increasing need 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 into the water resources is to define regional patterns of their quality, quantity, and utilization. Infect 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 river, streams and lakes are most important sources to be used for irrigation purpose, thus use of irrigation is conditioned by several variables.

‘’Increased irrigation facilities had, in fact, begun tousher in the green revolution scenario in quite a few areas in the country even before the introduction of HYV and the Technological changes around 1966. The new technology, which is introduced in agricultural field has brought a very high production in several crops and is still continuing in many region. The bulk of increased food production at least in the immediate future will come from further expansion of irrigated areas and from the technology already available in the areas of availability. There is a little wonder that, most of the successful green revolution areas in India are of the high intensity of irrigation adequate and timely moisture supply is a sine-qua-non in the new agriculture and its success is linked closer with the development of irrigation. Extension of irrigational facilities and to the drought affected areas of the country, received special attention during the successive plan periods. The problem of low agricultural productivity can be tackled by improving from facilities and irrigational facilities. Irrigation disparity accounts for a substantial amount of variation is an agricultural output between regions. If constant supply of water is ensured, from formation and expansion of agriculture can take place. Without irrigation very little can be expected from extensive cultivation. Besides, irrigation helps vary greatly in raising the yield of land. Besides this enables the application of the modern input like fertilizers, high yielding varieties of seeds and other insecticides and pesticides etc. this aspect is of more significant in case of Dakshina Kannada district.

STUDY AREA

Dakshina Kannada district is located south western part of Karnataka state in india with a population of 20, 83,625 persons (census 2011). Geographically it lies between 13^0 50’ and $14^0$30’ north latitude, and 68^0 .00’ and 70^0.10’ east longitude. The district was bifurcated in 1859 from north canara district. The total area of Dakshina Kannada district is 477381 sq km. administratively the Dakshinaa Kannada district is divided seven tehsil namely Mangalore. Sullia, Puttur, Belthsngadi, Moodbidri, bantwal and Kadaba. The study is bounded from the north by Udupi and Chikkamagalore district, southern by Kasaragod (Kerala), Kodagu district eastern by Hassan district, and western by Arabian Sea.



OBJECTIVES

1. To know how irrigation plays an important role in agricultural production.
2. To analysis the different systems of irrigation and their operations and also
3. To know the changes that they undergo.

METHODOLOGY

The present study is based on secondary sources of data, collected from district statistical bulletin of Dakshina Kannada district (2010-11 & 2020-21), census of India (2011) and various published and unpublished articles, books, journals etc.

The intensity of irrigation can be calculated by the following method:

$$\text{Intensity of Irrigation} = \frac{\text{Gross area irrigated}}{\text{Net area irrigated}} \times 100$$

(*Gross area irrigated means: Net area irrigated plus Area irrigated more than one)

DISCUSSION

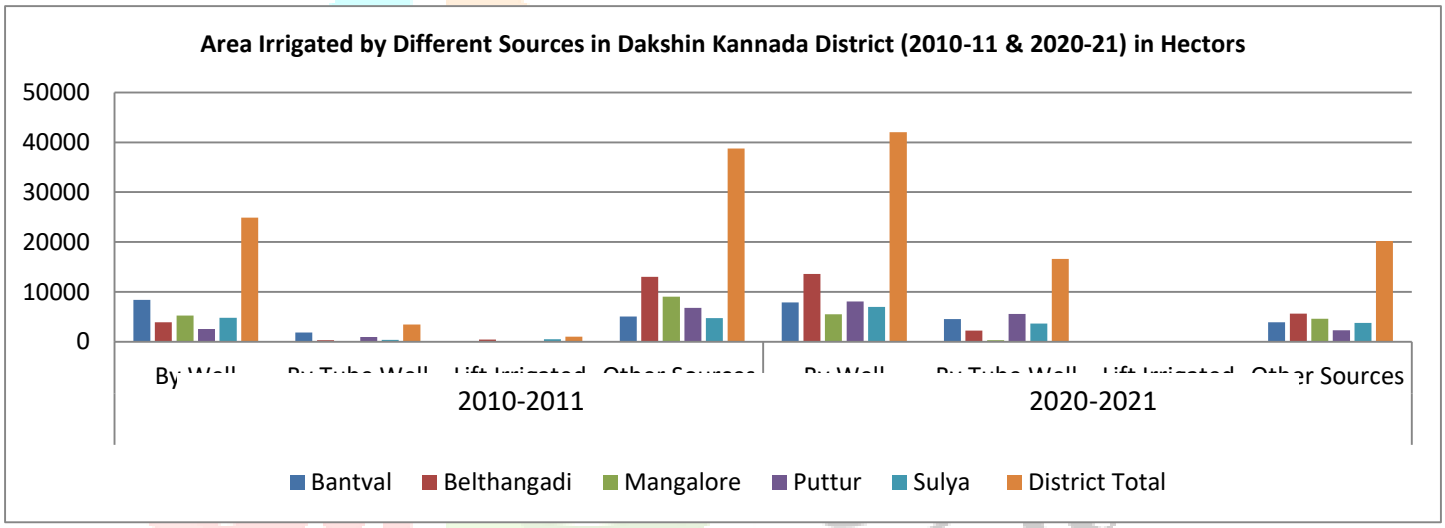
In the foregoing, analysis and evaluation of the aspects of irrigation in Dakshina Kannada district, has been made in detail in order to understand the role and impact of irrigation in development of agriculture and its efficiency. The study on irrigation chapter certainly contributes to a greater extent to understanding the future course of probable change in land use of Dakshina Kannada district and there by arising needs for planning of agriculture in Dakshina Kannada district. The sources of irrigation can be classified into a) Canal, b) Tanks, 3) Wells, 4) other sources. In Dakshina Kannada district there are no canal irrigation facilities. Tanks, well, lift irrigation and through other means, irrigation facilities are provided the details of irrigation.

Table No.1: Area Irrigated by Different Sources in Dakshina Kannada District (2010-11) in Hectors

Sl.No	Taluks	Net sown Area	Net Area Irrigated	By Well	Tube Well	Lift Irrigated	Other Sources
1	Bantwal	34233	15291 **(44.66)**	8391 **(54.87)**	1844 **(12.05)**	10 **(0.06)**	5044 **(32.98)**
2	Belthangadi	42752	17262 **(40.37)**	3914 **(22.67)**	287 **(1.66)**	429 **(2.48)**	13052 **(75.61)**
3	Mangalore	38346	14760 **(38.49)**	5267 **(35.68)**	52 **(0.35)**	67 **(0.45)**	9059 **(61.37)**
4	Puttur	25008	11413 **(45.63)**	2542 **(22.27)**	947 **(8.29)**	49 **(0.42)**	6806 **(59.63)**
5	Sullia	20781	9947 **(47.86)**	4790 **(48.15)**	360 **(3.61)**	484 **(4.86)**	4767 **(47.92)**
	District Total	161210	68673 **(42.59)**	24904 **(36.26)**	3490 **(5.08)**	1039 **(1.51)**	38728 **(56.39)**

Table No.2: Area Irrigated by different sources in Dakshina Kannada district (2020-21) in Hectors

Sl.No	Taluks	Net Sown Area	Net Area Irrigated	By Well	By Tube Well	Lift Irrigation	Other Sources
1	Bantwal	34709	16367 **(47.15)**	7881 **(48.15)**	4544 **(27.73)**	21 **(0.12)**	3921 **(23.95)**
2	Belthangadi	46717	21428 **(45.86)**	13568 **(63.31)**	2232 **(10.41)**	8 **(0.03)**	5620 **(26.22)**
3	Mangalore	26750	10777 **(40.28)**	5542 **(51.42)**	292 **(2.49)**	32 **(0.29)**	4611 **(42.78)**
4	Puttur	31889	15992 **(50.14)**	8068 **(50.45)**	5597 **(34.99)**	44 **(0.27)**	2283 **(14.27)**
5	Sullia	26090	14405 **(55.21)**	6967 **(48.36)**	3624 **(25.15)**	24 **(0.16)**	3796 **(26.31)**
	District Total	166155	78969 **(47.52)**	42026 **(53.21)**	16589 **(21.00)**	129 **(0.16)**	20225 **(25.61)**



Well irrigation

The taluk wise share of area under well irrigation during 2010-11 was as fallow: 54.87% in Bantwal, 22.67% in Belthangadi, 35.68% in Mangalore, 22.27% in Puttur and 48.15% in Sullia taluk. In the year 2020-21 the area under well irrigation was: Belthangadi 63.31%, Mangalore 51.42%, Puttur 50.45%, Sullia 48.36% and Bantwal 48.15%. Out of total irrigated area in Dakshina Kannada district during 2010-11 the area under well irrigation shared 36.26% and it further increased to 53.21% during 2020-21.

Tube well

In the year 2010-11 the area under tube well irrigation was as fallow: Bantwal 12.05%, Puttur 8.29%, Sullia 3.61%, Belthangadi 1.66%, and Mangalore 0.35%. During the year 2020-21 the area under tube well irrigation was Puttur 34.99%, Bantwal 27.73%, Sullia 25.15%, Belthangadi 10.41% and Mangalore 2.49%.

Irrigation by other sources

In additional to canal, well and tube well irrigation, the other sources like lift water, precipitation, atmospheric water other than precipitation, flood water and ground water are also used to irrigate agriculture land. During 2010-11, Dakshina Kannada district had 38,728 hectares, (56.39%) of land under irrigation by other sources. Belthangadi taluk had highest arable land 13,052 hectares under irrigated by other sources. It was followed by Bantwal 5,042 hectares, (32.98%), Mangalore 9,059. (61.37%), Puttur 6,806 hectares (59.63%), and Sullia 4,767 hectares (47.92%). In 2020-21, the district had 20,225 hectares, (25.61%) of land under

irrigation by other sources. During this year Mangalore taluk shared highest arable land 4,611 (42.78%) under irrigation by other sources. Sullia 3,796 hectares, (26.31%), Bantwal 3,921 hectares (23.95%), Belthangadi 5,620 hectares, (26.22%) and Puttur 2,283 hectares (14.27%). In the district, during a span of 15 years, 18,503 hectares, (52.22%) of land was increased under the irrigated by other sources.

Intensity of irrigation

Intensity of irrigation is controlled by various factors such as sources of irrigation, types of crops grown, cropping season, quantity and quality of water supply, density of network of water channels etc. the benefits of intensive irrigation are reflected in the cropping patterns productivity of land, land use efficiency and method of cultivation. In an agricultural region, other things being equal, the intensity of irrigation will increase with decrease of rainfall and vice-versa, the intensity of irrigation will always remain law and negligible in rain fed areas whereas there is restricted surface water. Limited salt-ridden sub soil water, and hilly or undulating topography. The intensity of irrigation is not uniform in Dakshina Kannada district. The district as a whole intensity value was 99.08 in 2010-11 whereas it increased to 99.45 in 2020-21. The net increased in the intensity of irrigation.

Table No. 3: Dakshina Kannada District Intensity of irrigation

Sl.No	Name of the Taluk	2010-11	2020-21	Change + or -
1	Bantwal	99.98	100	0.02
2	Belthangadi	102.43	100	-2.43
3	Mangalore	97.86	97.21	-0.65
4	Puttur	90.63	100	9.37
5	Sullia	104.52	100.04	-4.48
	District Average	**99.08**	**99.45**	**0.37**

Table No.4: Dakshina Kannada district Intensity of Irrigation Categories For 2010-11 and 2020-21

	2010-11			2020-21		
Intensity Categories	**Range of Intensity**	**No.of Taluks**	**Name of the Taluk**	**Range of Intensity**	**No. of Taluks**	**Name of the Taluks**
Low	90.63-95.00	1	Puttur	90.00-95.00	NIL	NIL
Medium	95.00-100.00	2	Mangalore Bantwal	97.212-99.00	1	Mangalore
High	Above 100.00	2	Belthangadi Sullia	above 100	4	Bantwal, Belthangadi, Putur, Sullia

The taluk wise analysis reveals that during 2010-11, there were no taluk in the district is very low and very high intensity of irrigation in the district. One taluk were under low intensity i.e., Puttur (90.63). Bantwal (99.98)and Mangalore (97.86), medium intensity. High intensity was in two taluks namely Belthangadi (102.43) and Sullia (104.52). The intensity of irrigation increased substantially during 2020-21. The very high intensity was not found in district during this period there were no taluks in low intensity of irrigation. Medium intensity taluk in Mangalore (97.21), high intensity taluks are Bantwal (100.00), Belthangadi (100.00), Puttur (100.00) and Sullia (100.04). Three taluks out of five taluks decreased their intensity of irrigation over a period of 10 years i.e., 2010-11 to 2020-21.

CONCLUSION

The automated irrigation system implemented was found to be feasible and cost effective for optimizing water resources for Agriculture production. This irrigation system allows cultivation in places with water scarcity thereby improving sustainability. The irrigation system helps the farmer by making his work smarter. As the demand for water increases, along with the need to protect aquatic habitats, water conservation practices for irrigation need to be effective and affordable. As multiple sensors are used water can be provided only to the required area of land. This system reduces the water consumption to greater extent. It needs minimal maintenance. The power consumption has been reduced very much. The crop productivity increases and the wastage of crops are very much reduced. The extension work is to make user interface much simpler by just using SMS messages for notifications and to operate the switches.

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