



**ORIGINAL RESEARCH PAPER**

**Geography**

**“SPATIAL ANALYSIS OF IRRIGATION AND MAJOR OILSEEDS PRODUCTION AND PRODUCTIVITY IN DHARWAD DISTRICT OF KARNATAKA STATE.”**

**KEY WORDS:** Agriculture, Irrigation, Oilseeds, Sown Area, Taluks, Production, Yield.

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**ABSTRACT**

Agriculture is not only an important economic activity but also a farm of social heritage and a way of life for the millions of Indian farmers. Irrigation is playing an important role on growing the oilseeds sector, there is an urgent need to find out ways to increase water supply. In this regard Dharwad district, which is aglomeration of wet and dry weather features and also the mixture of different soils and irrigated and dry cropping system represents a typical region to study the agricultural geography in general and major oilseeds in particular. Edible oilseeds cultivation in India is an integral part of agricultural system, as edible oilseeds are part of food item for the human population. The cultivation of oilseeds are found in all taluks of Dharwad district where annual rain fall to extent of 75 cm is available, besides the availability of irrigation in some parts, coupled with availability of black and red soils that have favored the cultivation of oilseeds.

**INTRODUCTION:**

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 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 seed make timely needs of water prerequisite.”

**Study Area:**

Dharwad District is an administrative district of the state of Karnataka in southern India. Dharwad is the cultural headquarters of north Karnataka. The administrative headquarters of the district is the town of Dharwad. Before 1997 the district had an area of 13738 Sq km. In 1997, the Dharwad district was bifurcated and new districts of Gadag and Haveri were created out of Dharwad's former territory. It is claimed that Dharwar is second-most advanced district in Karnataka. Dharwad district is extending between 14°-45' North to 15°-35' North Latitudes and 74°-45' East to 75°-30' East Longitudes with an area about 4,249 Sq km which accounts 2.22 per cent of the total area of the state. The district is bound on the north by the district of Belguam, on the east by the district of Gadag, on the south Haveri and on the west by Uttar Kannada district. All these districts, which surround Dharwad district, belong to Karnataka state itself (Fig 1).

The district lies approximately about 800 meters above the Mean Sea Level that is why it enjoys a moderate and healthy climate. Geologically most of the rocks of the peninsular part of India are very old and complex, and possess a large variety of rock formation of different geological ages. The western extremities are characterized by Dharwad shale. The district may be divided into 3 natural regions, viz., the Malnad, Semi-Malnad and Maidan. These regions, on an average, receive moderate to heavy rainfall and have dense vegetation. Kalghatagi, Alnavar, and Dharwad taluks in particular receive more rainfall than other taluks of the district. Administratively it consists of 8 taluks viz. Alnavar, Annigeri, Dharwad, Hubballi Nagar, Hubballi, Kalghatgi, Kundgol and Navalgund, 6 urban agglomerations, 127 village panchayatas, and 379 inhabited villages. As per the 2011 census the total population of the district is 1846993, out of which 939127 male and 907866 is the female population, while 45.02% of rural and 54.97% urban

population, the density of the population of Dharwad district is 434 persons/per sq km. The literacy rate in Dharwad district is 80.30%, while sex ratio is 971 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 three important Malaprabha river tributaries viz. the Bennihalla basin which covers Navalgund, Annigeri and Hubballi taluks, and Bedti and Tattihall covers Dharwad and Kalghatgi taluks. These three 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:**

- i) To study taluka wise intensity of irrigation in Dharwad district.
- ii) To study the taluka wise net sown area, Production and productivity of total oilseeds in Dharwad district.

**METHODOLOGY AND DATA BASE:**

Secondary data has been collected for the district, for the year 2020-21. Simple techniques have been used to analyzed secondary data and based on the results, maps and diagrams are shown.

**Dharwad District Location Map**



**Fig-1**

**DISCUSSION:**

Water is among the most essential requisites that nature provides to sustain life of plants, animals and human beings. "An artificial feeding of water to the agricultural land for growing crops is known as irrigation on India has more than 30% of the world's irrigated land. It receives about 70% of rainfall during south-west monsoon, as such, storage of water is imperative for assured irrigation. The district have only small tributaries and non-perennial rivers like shalmala, Bennihalla and Tupparihall these streams which flow mainly in rainy season. The Karnataka's progress III irrigation though impressive is inadequate to effectively meet the challenge of the high yield technology. Delay in the completion of the several major irrigation projects and neglects of minor are mostly responsible for this. An evaluation of the aspects of irrigation in Dharwad district has been made in detail in order to understand the role and impact of irrigation on development of agricultural and its efficiency. According to 2020-21 statistics, the district has 325550 hectares (76.18%) of land as net sown area, and out of which 62403 hectares of land is irrigated i.e. 19.16 % the taluk wise land under irrigation by various methods is shown in the **table 2**. In this district, the two sources of irrigation has been experiencing by the formers, namely the **Canal irrigation** and the **Tube well irrigation**. Navalgund is the leading taluk under net irrigated area with 37.74 % of land under irrigation out of 61536 hectares of its net sown area. The river Malaprabha right bank canal flows in this taluk and thereby it has good chance to get more water from this canal, Alnavar and Dharwad taluks also shows their good facility of Tube well irrigated area with 80.62 % and 24.77 % respectively land under irrigation out of 5340 hectares and 16089 hectare of their net sown area, these two taluks are coming under Malnad and heavy rainfall zones. Remaining taluks viz Kalaghatagi 10.90%, Hubli 8.31% Annigeri 5.04%, Kundagol 2.05% and Hubballi Nagar 1.53%, have their lands under irrigation.

The intensity of irrigation is not uniform in Dharwad district. The district as a whole intensity value is 19.16 %. The net increase in the intensity of irrigation in the district, the three taluks are above the district average and five taluks are the below the district average (**Table-1 and fig 2**).

**Dharwad Distric Total Net Sown Area, Net Irrigated Area And Intencity Of Irrigation Table No- 1**

Taluks	Net Sown Area	%	Cen als	%	Tube Well	%	Net Irri gated Area	Intencity Of Irrigation	Ran ge
Alnavar	66213	2.0	--	--	5340	11.71	5340	80.62	H
Annigeri	35154	10.79	1604	12.7	775	1.70	3151	8.96	L
Dharwad	64941	19.94	--	--	16089	35.29	16089	24.77	H
Hubballi Nagar	10022	3.0	--	--	958	2.10	958	9.58	L
Hubballi	45886	14.09	--	--	5224	11.45	5224	11.38	L
Kalaghatagi	41363	12.70	--	--	6803	14.92	6803	16.44	L
Kundagol	60027	18.43	--	--	1284	2.81	1284	2.13	L
Navalgund	61536	18.90	109	87.90	9115	19.99	23554	38.27	H
District Total	325550	99.95	125	10.94	4558	100.08	62403	19.16	

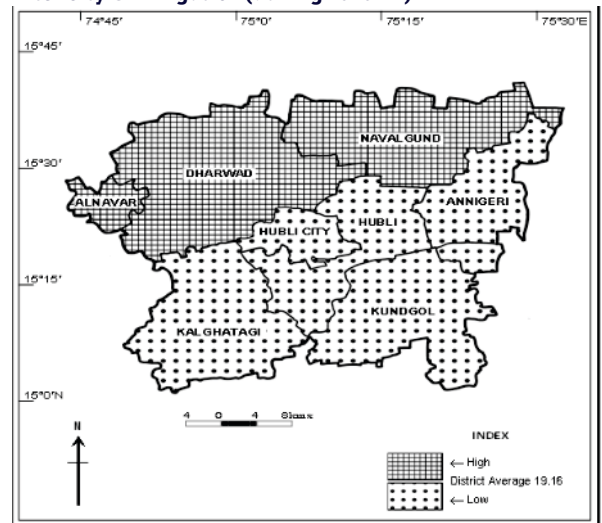
**Source: District At A Glance 2020-21**

**General Land Use:**

The district has total Geographical area of 427329 hectares. Out of which 8.24% of land under forest. The net sown area accounts for 76.18 % the non-agriculture land is 6.96 %, the

fallow land is 7.10% and cultivable waste land is 0.62% permanent pasture and trees and groves is 0.04%. From the above data is it reveals that, the district has good percentage of land under agriculture. The forest land is more concentrated in three taluks like, Alnavar (36.37%) Kalaghatagi (28.39%), and Dharwad (9.27%) taluks respectively. The remaining taluks are Hubbli (3.56%), Hubballi Nagar (0.19%) taluks have less area under forests. There is no forest land in Kundagol and Navalgund taluks. It is known fact that, forests play an important role in maintaining the environmental and ecological balance of an area. The only malnad zone consisting of Alnavar, Kalaghatagi and Dharwad (Part of it) taluks has monsoon deciduous forest. In the rest of the part of Dharwad District the forest is bushy, thorny and desert type. It is advisable that in the district more land under forests can be brought by making a wise plan of reallocation of existing land use. In this regards the land which is follow (7.10 %) cultivable waste land (0.62%), land not available for cultivation 6.03% can be utilized for forest growth of different botanical varieties, depending upon rainfall distribution and soil type. If this is materialized then district will have 8.24 % land under forest, which is a less forest area than approved figure for maintenance of ecological setting of a region. However, while making this plan the taluks that have very less percentage of land under forest should be considered on top priority for afforestation. The general land use in the district exhibits that 76.18% of land is devoted for cultivation and which a good sign for the development of agriculture.

**Dharwad District Intencity Of Irrigation (during 2020-21)**



**Fig-2 Agriculture Land Use:**

The district has 427329 hectares of land is total geographical area. Out of that 325550 hectares (76.18%) of land as net sowed area. Amongst all taluks the Dharwad taluk having largest geographical area (99482 hectares), second place is Navalgund (69604 hectares) has naturally more land under agriculture in these two taluks. When compared with district percentage of sown area, Kundagol accounts for 92.54 % land under sown. Which is the largest taluk having more land under sown area.

Out of the various land use of Dharwad district the Kundagol taluk 92% of land is under net sown. Rest of the taluks ranges between 53 % to 91 % under net sown area. This statistics reveal that, all the taluks have greater role to play in agriculture efficiency by way of utilizing the cultivable land in a scientific way. Though we find very good proportion of land under cultivation in various taluks, yet all such taluks are not equally efficient in levels of agricultural development and yield per hectare. Thus, the existing agricultural land use calls for quality improvement rather than, increase in land under cultivation

**Major Oilseeds:**

In the present study, **groundnut, sunflower, safflower, soybean and sesame are the major oilseed crops as growing in Dharwad district.** The area under oilseed cultivation has been classified into three categories, in order to know how the spatial variation at taluka level is. There are three taluks are high range of area under all types of oilseeds cultivation where Kundagol taluk(22854 hectares), Dharwad taluk (15411 hectares), and Hubballi taluks (12862 hectares) appears ranks first and sharing 30.83%, 20.79%, and 17.35 % respectively. Although these taluks are geographically well suited for oilseeds cultivation. In the medium range of area under oilseeds cultivation four taluks are identified viz Kalagatagi (11066 hectares), Hubballi Nagar (5419 hectares), Navalagund (3305 hectares) and Annigeri (3155 hectares) sharing at 14.93%, 7.31%, 4.45% and 4.26% respectively. In the low range of area under oilseeds cultivation only one taluk has appeared i.e. Alnavar (46 hectares) shared by 0.06 % this taluk is comes under heavy rainfall area and paddy cultivation zone. **(Table 2 and Fig-3)**

The productivity of major oilseeds related with suitable of physical conditions for cultivation, apart from extant of irrigation, fertility of soil, management of soil with suitable fertilizer and socio-economic conditions of the farmers. As a result of these factors the productivity of major oilseeds (per hectare yield) is not appearing as more as the district average yield (981.82 kg/hectare). **(Table 3&4)**

**Taluka- wise Oilseed Crop wise sown Area, Production and productivity (per hectare Yield) in Dharwad District 2020-21** (Area in Hectares, Production in Tones and Yield in Kg's) **Table 3**

Sl. No.	Name Of Taluks	Ground Nut			Sunflower			Soyabean			Safflower			Seasum		
		Area	Production	Yield	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
1	Alnavar	0	0	0	00	0	0	46	47	1021.7	0	0	0	0	0	0
2	Annigeri	2724	2609	957.7	46	30	652.	3	3	1000	379	374	986.8	1	1	1000
3	Dharwad	2720	2946	1083.0	7	6	857.1	12092	12772	1056	581	694	1194.4	3	2	666.6
4	Hubballi N	1610	1548	961.49	0	0	0	3018	3067	1016.2	791	780	986.09	0	0	0
5	Hubballi	6692	6454	964.4	10	7	700	5620	6092	1083.98	529	525	992.43	7	6	857.14
6	Kalaghtagi	348	578	1660.9	0	0	0	10700	10966	1024.85	7	6	857.14	1	1	1000
7	Kundgol	20292	19210	946.6	37	28	756.7	879	618	703.07	1634	1291	790.08	6	5	833.33
8	Navalgund	1784	1569	879.4	884	475	50.1	41	42	1024.39	592	577	974.66	1	1	1000
	District	36170	34914	965.2	984	546	554.8	32399	33607	1037.28	4513	4247	941.05	19	16	842.10

Source :District At A Glance 2020-21

**Taluka- wise Percentage to District Total of Oilseed Crop wise sown Area, Production in Dharwad District 2020-21 Table 4**

Sl No.	Name Of Taluks	Groundnut		Sunflower		Soyabean		Safflower		Seasum	
		Area %	Production %	Area%	Production%	Area%	Production%	Area%	Production%	Area%	Production%
1	Alnavar	0	0	0	0	0.14	0.13	0	0	0	0
2	Annigeri	7.53	7.47	4.67	5.49	0.00	0.00	8.39	8.80	5.26	6.25
3	Dharwad	7.52	8.43	0.71	1.09	37.32	38.00	12.87	16.34	15.78	12.5
4	Hubballi N	4.45	4.43	0	0	9.31	9.12	17.52	18.36	0	0
5	Hubballi	18.50	18.48	1.01	1.28	17.34	18.12	11.72	12.36	36.84	37.5
6	Kalaghtagi	0.94	1.65	0	0	33.0	32.63	0.15	0.14	5.26	6.25
7	Kundgol	56.10	55.02	3.76	5.12	2.71	2.07	36.20	30.39	31.57	31.25
8	Navalgund	4.93	4.49	89.83	86.99	0.12	0.12	13.11	13.56	5.26	6.25
		99.97	99.98	99.98	99.98	99.94	99.98	99.96	99.98	99.97	99.99

Source:District At A Glance 2020-21

**CONCLUSION:**

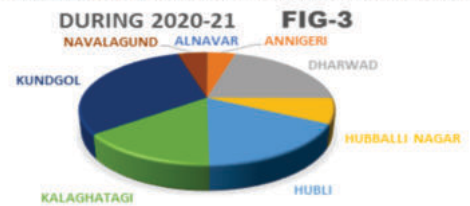
An important factor responsible for the shortage of calories in diet of the people in the developing countries is very low intake of fats & oils per head. Thus even with adequate availability of cereal food grains, the problem of malnutrition may continue because of shortage of fats & oils in the food. At present in India the per capita intake of fats & oils at present is less than 10 grams per person, per day though the recommended intake is 40 grams per person per day. It should be noted that, the shortage of fats in the diet of the people of the developing countries creates a problem not only of calories but also of protein. The relatively small amount of protein in the diet of many people in India may be

**Taluka- wise All Oilseeds sown Area, Production and productivity in Dharwad District 2020-21** (Area in Hectares, Production in Tones and Yield in Kg's) **Table 2**

Sl No	Name Of Taluks	Oilseeds Sown Area	% To District Total	Production Of Oilseeds	% To District Total	Yield
1	Alnavar	46	0.06	47	0.06	1021
2	Annigeri	3155	4.26	3017	4.14	956
3	Dharwad	15411	20.79	16421	22.56	1065
4	Hubballi Nagar	5419	7.31	5396	7.41	995.75
5	Hubli	12862	17.35	13084	17.97	1017
6	Kalaghatagi	11066	14.93	11553	15.87	1044
7	Kundgol	22854	30.83	21153	29.06	925.57
8	Navalagund	3305	4.45	2665	3.66	806.35
	Dist.Total	74118	99.98	72771	99.98	981.82

Source : District At A Glance 2020-21

**MAJOR OILSEEDS CULTIVATION IN DHARWAD DISTRICT**



**Taluka- wise Oilseed Crop wise sown Area, Production and productivity (per hectare Yield) in Dharwad District 2020-21** (Area in Hectares, Production in Tones and Yield in Kg's) **Table 3**

(This table is identical to Table 3 in the provided document and is therefore not repeated here.)

Source :District At A Glance 2020-21

**Taluka- wise Percentage to District Total of Oilseed Crop wise sown Area, Production in Dharwad District 2020-21 Table 4**

(This table is identical to Table 4 in the provided document and is therefore not repeated here.)

Source:District At A Glance 2020-21

up to provide calories, and in this way it fails to perform its expected function of tissue building. Fats also act as important sources of some of vitamins & essential fatty acids, which play an important role in key metabolic process including the formation of membranes. Therefore it is most important matter, even for geographers to study the spatio-temporal analysis of production of oilseeds, so as to meet the requirements of edible oil for human consumption.

The farmer of oilseed cultivation will get benefit and thereby they can produce more yields of oilseeds than what it is at present. The soils of Karnataka are sufficiently suitable for the cultivation of oilseeds. However, they need manuring,

treatment and irrigation (when rain fails) so as to find successful cultivation of oilseed crops. Out of 64% of land under agriculture in Karnataka, about 12% is occupied by all types of oilseeds and this can be further increased by way of cultivating 9% of land which is under cultivable waste. The objectives laid in the Technology Mission on oilseeds have to be continuously implemented, for which concerned departments of central government, State governments and Agriculture universities have to do their share unflinchingly.

In identifying the productivity of a taluks, the yield, area sown, labour involved and price of the agricultural products are considered. Dharwad and Hubli taluks are appears in high concentration during 2020-21. These two taluks have shown an improvement in productivity due to the influence of irrigation and fertilizers used by the formers. Annigeri, Kalaghatagi, Kundagol and Navalgund taluks have appeared in medium concentration region due to extremely dryness and humidity etc. The Alnavar and Hubballi Nagar taluks fall under the low concentration region due to lack of irrigation facility lack of fertile soil and dryness conditions. Overall the agricultural productivity region in Dharwad district is under developed with the influenced of Government facilities and programmes to be adopted.

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