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Geography

"LAND-USE UNDER MAJOR FOOD CROPS AND THEIR PRODUCTIVITY IN DHARWAD DISTRICT OF KARNATAKA STATE: A GEOGRAPHICAL ANALYSIS"

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ABSTRACT India is rich in Agricultural resources and yet, has remained poor because of stagnation in the subsistence agricultural economy and undue reliance upon it. 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. In some parts of India, progress in irrigation and farm practices have touched the basic problems of low agricultural productivity and rural poverty. Climate is one of the major physical factors influencing on Indian agriculture. Due to uncertainty of monsoonal rains, agriculture in India is not developing uniformly besides other constraints life quality of soil and infrastructural facilities. Therefore, Geographers can certainly play their role in understanding the problems of land use and agriculture of all the regional level like micro, meso and macro. In this regard Dharwad district, which is agglomeration 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 agricultural productivity in particular.

KEYWORDS : Agriculture, land-use, net sown area, production, productivity, taluks.

Study Area:

Dharwad District is an administrative district of the state of Karnataka in southern India. Dharwad is the cultural heritage of the headquarter of north Karnataka. The administrative headquarters of the district is the town of Dharwad. 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 Belagavi, 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. Alnavar, Dharwad, and Kalghatagi, 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 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, pulses and oilseeds and that of red soil is more suitable for paddy.

OBJECTIVES:

1) To study the taluka wise general land use in Dharwad district during 2020-21.
2) To examine the taluka wise selected cropping system in Dharwad district during 2020-21.
3) To examine the M. G. Kendal's ranking method applied to productivity of all six major food crops.

DATA BASE AND METHODOLOGY:

The above objectives have been analyzed with the help of categorization of ranges by using mean and standard deviation method, Kendal's ranking method pie charts and choropleth method have been used in this paper. The secondary data collected from District Statistical office, Dharwad and Agriculture Department published by the Directorate of Economics and Statistics, Government of Karnataka

DISCUSSION:

As our country is located in the tropical latitudes, rainfall is the dominant parameter that influences plant growth, crop production, and socio- economic activities. The distribution of rainfall is uneven and is generally influenced by its relief features. The average annual rainfall ranges from 787 mm in the Maidan region to 1319 mm in the Malnad. Though the study region is exposed to both the monsoon, it receives most of the rainfall from the south- west monsoon. The monsoon usually starts from the first week of June. It clearly exhibits that Alnavar(1319mm), Kalghatgi(1221mm) and Dharwad(1081mm) taluks get highest rainfall from the south west monsoon. The other taluks have got less than district average rainfall (1009 mm) in 2020-21. The district has only small tributaries and non-perennial rivers like Shalmala, Bennihalla and Tupparihall these streams which flow mainly in rainy season. 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 under irrigation i.e. 19.16 %, In this district, the two sources of irrigation have 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.

General Land Use:

Land use is the surface utilization of all developed and vacant lands on a specific space, at a given time. Lands are used for crops, forest, pasture, mining, transportation, garden, residential recreational, industrial and commercial. Whereas uncultivable wasteland, barren and fallow land, are unused land. Land use is also related to conservation of land from one major use to another general use. The use of land changes according to the changing needs of man. 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.

Dharwad District
Location Map

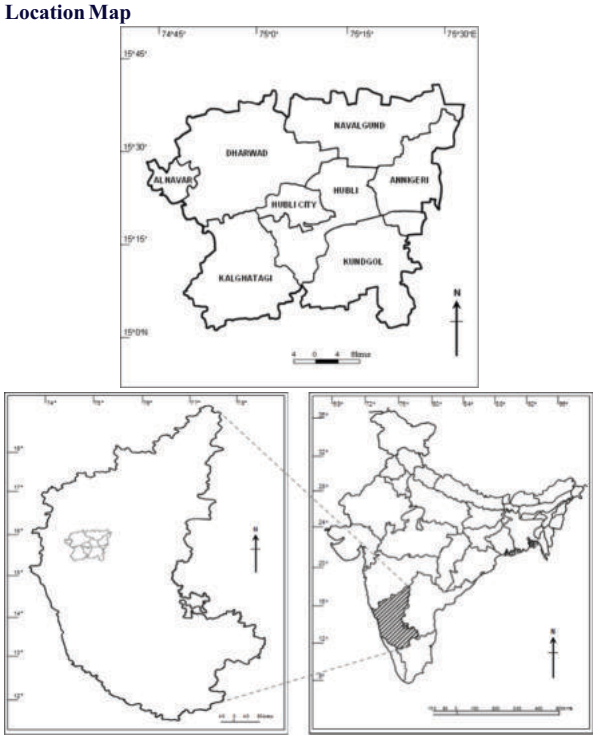


Fig-1 The remaining taluks are Hubblli (3.56%), Hubballi Nagar (0.19%) taluks have less area under forests. There is no forest land in Kundagol and Navalgund taluks. It is known fact that, forests play an important role in maintaining the environmental and ecological balance of an area. The only malnad 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 fallow (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 **(Table-1 Fig-2&3)**.

Agriculture Land Use:
The district has 427329 hectares of land is total geographical area. Out of those 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. These 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.

Crop Land Use:
In this district, the selected major food crops can be chosen like paddy, jowar, maize, wheat, pulses and oilseeds are taken for study. In Dharwad district, the dominant food crops are wheat, maize, and pulses are growing by the formers. The suitable climatic condition, fertile black soil and use of high yielding verity seeds are the major aspects to grow such crops. **(Table-2&3)**. Agricultural productivity is an important indicator to show the spatial pattern of agricultural development in Dharwad district a study would help the planners in preparing the future perspectives in agricultural development on a rational basis and to reduce the regional disparities. Agricultural productivity may be defined as the ratio of output to the input used in form production. V. K.R.V. Rao explained that the "productivity is a physical phenomenon rather than a value concept and it describes the changing relation between output and the major inputs like land, labor and capital". S. S. Bhatia equated agricultural productivity with agricultural efficiency and defined agricultural productivity as "The aggregate performance of various crops in regard to their output per acre, but the contributions of each crop to the agricultural efficiency would be related to its share of the crop land". Therefore, agricultural productivity is more imperia! And is closely related to per hectare yield. Thus, it is the actual performance of the land in terms of per unit area yields of crops.

Agricultural Productivity
Agricultural Productivity Is Measured In The Following Methods:
1) Output per unit of labour applied or man hours.2) Output is a relation to input or output input relation.3) Output per unit area.4) Output as expressed in terms of grain equivalent per head of population.5) Output in terms of calories.6) Output in terms of monetary value.

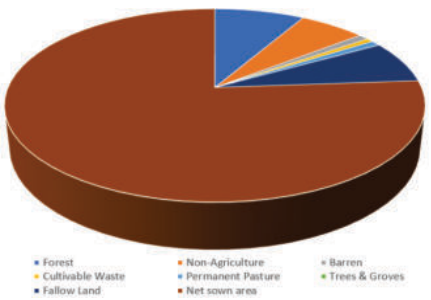
In this study of "Land use under productivity of selected food crops in Dharwad district: A Geographical analysis", an attempt has been made to determine agricultural productivity and six major food crops like paddy, jowar, maize, wheat, pulses and oilseeds of Dharwad district by applying M. G. Kendall's ranking coefficient method. Since this method is well suited to the study of agricultural productivity than any other methods mentioned above. **(Table-2&3)**

As per M. G. Kendall's method the results have been grouped into three broad categories of agricultural productivity regions based on the mean and standard deviation techniques.

High Productivity Region:
Here we observing the ranking criteria, the lower the ranks higher the values that in the categorization. During 2020-21 Hubballi taluk appear in high category, but, as we see in the net sown area and production the Dharwad taluk fall under high category but we come to per hectare yield Hubballi taluk is first place, this taluk falls under dry farming region, and irrigation extended by river Malaprabha right bank canal in this taluk. The facilities extended by the government might have influenced the farmers to grow more food /cash crops. Besides this, the fertile soil, use of fertilizer, HYV seeds, pesticides and insecticides and the use of modern farm technology have also played an important role to bring this taluk under high productivity region. **(Table-4,5,6 & Fig-4)**

Medium Productivity Region:
In the year 2020-21, six taluks are fall under medium category like Navalagund taluk, Annigeri and Hubballi nagar taluks are comes under this category. These three taluks fall under dry farming region Alnavar taluk, Dharwad and Kalaghatagi taluks are also comes under this category, and these taluks located in malnad and heavy rainfall zones and made these taluks, as medium productivity region.

Low Productivity Region:
In 2020-21, only one taluk viz Kundagol fall under low category of agricultural productivity region. Because the farmers are in traditional minds. This taluk is coming under rain shadow region. **(Table-4,5,6 & Fig-4)**



Dharwad District Landuse Particulars For The Year 2020-21 (area In Hectares) Fig -2

Dharwad District General Land Utilization 2020-21
Table-1

Sl. No.	Taluks	Geographical Area	Forest	%	Non-Agriculture	%	Barren	%	Cultivable Waste	%	Permanent Pasture	%	Trees & Groves	%	Fallow Land	%	Net sown area	%
1	Alnavar	12306	4476	36.37	1021	8.26	45	0.36	39	0.31	53	0.43	0	0	51	0.41	6621	53.80
2	Annigeri	38614	0	0	1801	4.66	192	0.49	19	0.04	02	0.01	1	0.002	1437	3.72	35154	91.03
3	Dharwad	99482	9200	9.25	8523	8.56	635	0.63	1442	1.44	1906	1.92	0	0	12785	12.85	64941	65.27
4	Hubballin	17728	35	0.2	3742	21.10	290	1.63	92	0.51	257	1.45	25	0.14	3265	18.41	10022	56.53
5	Hubballi	55979	1998	3.57	3311	5.91	747	1.33	14	0.02	350	0.63	38	0.06	3635	6.49	45886	81.97
6	Kalaghatagi	68757	19526	28.4	4057	5.90	956	1.39	798	1.16	688	1	0	0	1369	1.99	41363	60.15
7	Kundagol	64859	0	0	1748	2.69	665	1.02	173	0.26	312	0.48	119	0.18	1815	2.79	60027	92.54
8	Navalgund	69604	0	0	1574	2.26	455	0.65	42	0.06	3	0	2	0.002	5992	8.60	61536	88.40
	District	427329	35235	8.25	25785	6.03	3985	0.93	2669	0.62	3571	0.84	185	0.04	30349	7.10	325550	76.18

Source: District At A Glance 2020-2

Crop Land-use 2020-21 Major Food Crops (area In Hectors, Production In Tones And Yield In Kg)
Table-2

Sl. No.	Taluks	Paddy			Jowar			Maize			Wheat			Total Pulses			Total Oilseeds		
		Area	Production	Yield	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
1	Alnavar	1340 (13.35)*	1678 (13.52)	1252	7 (0.01)	6 (0.01)	857	1782 (3.15)	5870 (3.10)	3294	83 (0.37)	78 (0.36)	937	357 (0.25)	167 (0.21)	468	46 (0.06)	47 (0.06)	1021
2	Annigeri	0 (0)	0 (0)	0	2106 (5.34)	1827 (5.61)	867	1443 (2.55)	4763 (2.52)	3300	1780 (8.04)	1666 (7.82)	936	16617 (11.97)	8950 (11.58)	538	3155 (4.25)	3017 (4.11)	956
3	Dharwad	4296 (42.87)	4938 (39.78)	1149	10827 (27.45)	8529 (26.22)	787	10101 (17.88)	38627 (20.45)	3824	3419 (15.46)	2680 (12.57)	784	33786 (24.34)	19007 (24.60)	562	15411 (20.79)	16421 (22.39)	1065
4	Hubballi N	2 (0.01)	2 (0.01)	1000	1535 (3.89)	1302 (4.00)	848	1152 (2.04)	3949 (2.09)	3428	729 (3.29)	683 (3.20)	937	5203 (3.74)	2909 (3.76)	559	5419 (7.31)	5396 (7.35)	996
5	Hubballi	92 (0.91)	129 (1.03)	1402	4488 (11.38)	4648 (14.29)	1035	5807 (10.28)	18099 (9.58)	3116	2375 (10.73)	2493 (11.70)	1049	18054 (13.00)	11361 (14.70)	629	12862 (17.35)	13084 (17.84)	1017
6	Kalaghatagi	4223 (42.06)	5588 (45.02)	1323	9509 (24.11)	6884 (21.16)	723	23127 (40.95)	79226 (41.95)	3425	45 (0.20)	42 (0.19)	933	5728 (4.12)	2353 (3.04)	411	11066 (14.93)	11553 (15.75)	1044
7	Kundagol	76 (0.75)	64 (0.51)	842	7463 (18.92)	6025 (18.52)	807	2970 (5.25)	6747 (3.57)	2271	4510 (20.39)	4115 (19.31)	912	11492 (8.27)	6863 (8.88)	597	22854 (30.80)	21153 (28.84)	925
8	Navalgund	2 (0.01)	2 (0.01)	1000	3498 (8.87)	3298 (10.14)	942	10088 (17.86)	31539 (16.70)	3126	9174 (41.48)	9547 (44.81)	1040	47562 (34.26)	25627 (33.17)	538	3305 (4.45)	2665 (3.63)	806
	District	10031 (99.99)	12412 (99.99)	1237	39433 (99.99)	32519 (99.99)	872	56470 (99.98)	188820 (99.96)	3342	22115 (99.97)	21304 (99.96)	935	138799 (99.95)	77237 (99.98)	546	74119 (99.96)	73336 (99.97)	982

Source: District At A Glance 2020-21
Note: In Brackets Indicates That Percentage To District Total

Dharwad District Ranking Of Major Food Crops In 2020-21
Table-3

Sl. No.	Taluks	Paddy			Jowar			Maiz			Wheat			Total Pulses			Total Oilseeds		
		Area	Production	Yield	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
1	Alnavar	Iii	Iii	Iii	Viii	Viii	Iv	Vi	Vi	V	Vii	Vii	Iii	Viii	Viii	Vii	Viii	Viii	Iii
2	Annigeri	Vii	Vii	Vii	Vi	Vi	Iii	Vii	Vii	Iv	V	V	Iv	Iv	Iv	V	Vii	Vi	Vi
3	Dharwad	I	Ii	Iv	I	I	Vii	Ii	Ii	I	Iii	Iii	Vii	Ii	Ii	Iii	Ii	Ii	I
4	Hubballi N	Vi	Vi	V	Vii	Vii	V	Viii	Viii	Ii	Vi	Vi	Iii	Vii	Vi	Iv	V	V	V
5	Hubballi	Iv	Iv	I	Iv	Iv	I	Iv	Iv	Vii	Iv	Iv	I	Iii	Iii	I	Iii	Iii	Iv
6	Kalaghatagi	Ii	I	Ii	Ii	Ii	Viii	I	I	Iii	Viii	Viii	V	Vi	Vii	Viii	Iv	Iv	Ii
7	Kundagol	V	V	Vi	Iii	Iii	Vi	V	V	Viii	Ii	Ii	Vi	V	V	Ii	I	I	Vii
8	Navalgund	Vi	Vi	V	V	V	Ii	Iii	Iii	Vi	I	I	Ii	I	I	V	Vi	Vii	Viii
	District																		

Source: District At A Glance 2020-21

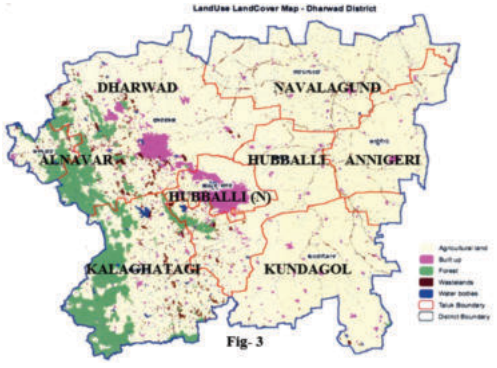


Fig- 3

Dharwad District Land-use Map-2020-21 Fig- 3

CONCLUSION:

In identifying the productivity of a taluk, the yield, area sown, labour involved and price of the agricultural products are considered. Hubballi taluk is appears in high agricultural region during 2020-21. This taluk has shown an improvement in development due to the influence of Malaprabha river project. Anlavar, Dharwad, Hubballi Nagar, Annigeri, Kalaghatagi, and Navalagund taluks have appeared in medium agricultural productivity region due to heavy rainfall, extremely dryness and humidity etc. The Kundagol taluk has fall under the low agricultural region due to lack of irrigation facility lack of fertile soil and dryness conditions.

The above said taluks having maximum irrigated area, and intensity of irrigation is high in these taluks, but the agriculture development is low because among the six crops (paddy, jowar, maize, wheat, oilseeds, pulses), the wheat crop is the only one first ranking crop in respect of area, production and productivity, rest of all crops are third fourth and fifth place, hence, Kundagol taluk is fall under low range. Overall, the agricultural productivity region in Dharwad district is under developed with the

influenced of Government facilities and progammes to be adopted.

Dharwad District Ranking Of All Crops-2020-21 Area
Table No-4

Taluks	Paddy	Jowar	Maize	Wheat	Pulses	Oilseeds	Ci	Range
Alnavar	Iii	Viii	Vi	Vii	Viii	Viii	6.66	L
Annigeri	Vii	Vi	Vii	V	Iv	Vii	6.00	L
Dharwad	I	I	Ii	Iii	Ii	Ii	1.83	H
Hubballi (N)	Vi	Vii	Viii	Vi	Vii	V	6.5	L
Hubballi	Iv	Iv	Iv	Iv	Iii	Iii	3.66	M
Kalaghatagi	Ii	Ii	I	Viii	Vi	Iv	3.83	M
Kundgol	V	Iii	V	Ii	V	I	3.5	M
Navalagund	Vi	V	Iii	I	I	Vi	3.66	M

Source: District At A Glance 2020-21

Dharwad District Ranking Of All Crops-2020-21 Production
Table No-5

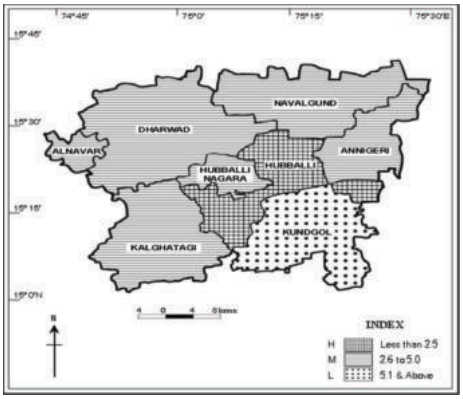
Taluks	Paddy	Jowar	Maize	Wheat	Pulses	Oilseeds	Ci	Range
Alnavar	Iii	Viii	Vi	Vii	Viii	Viii	6.66	L
Annigeri	Vii	Vi	Vii	V	Iv	Vi	5.83	L
Dharwad	Ii	I	Ii	Iii	Ii	Ii	2.00	H
Hubballi (N)	Vi	Vii	Viii	Vi	Vi	V	6.33	L
Hubballi	Iv	Iv	Iv	Iv	Iii	Iii	3.66	M
Kalaghatagi	I	Ii	I	Viii	Vii	Iv	3.83	M
Kundgol	V	Iii	V	Ii	V	I	3.5	M
Navalagund	Vi	V	Iii	I	I	Vii	3.83	M

Source: District At A Glance 2020-21

Dharwad District Ranking Of All Crops-2020-21 Productivity
Table No-6

Taluks	Paddy	Jowar	Maize	Wheat	Pulses	Oilseeds	Ci	Range
Alnavar	Iii	Iv	V	Iii	Vii	Iii	4.16	M
Annigeri	Vii	Iii	Iv	Iv	V	Vi	4.83	M
Dharwad	Iv	Vii	I	Vii	Iii	I	3.83	M
Hubballi (N)	V	V	Ii	Iii	Iv	V	4	M
Hubballi	I	I	Vii	I	I	Iv	2.5	H
Kalaghatagi	Ii	Viii	Iii	V	Viii	Ii	4.66	M
Kundgol	Vi	Vi	Viii	Vi	Ii	Vii	5.83	L
Navalagund	V	Ii	Vi	Ii	V	Viii	4.66	M

Source: District At A Glance 2020-21



Dharwad District Ranking Of All Crops – 2020-21 Productivity
Fig-4

REFERENCES

1. Bhatia, S.S. (1965) "Patterns of Crop Concentration and Diversification in India", *Economic Geography*, 41, pp. 40-56.
2. Enyedi, G.Y., (1964), *Geographical Types of Agriculture*, Budapest, Applied Geography in Hungary.
3. Husain, M., (1974) *Agricultural Geography*, Inter India Pub., New Delhi,
4. Husain, M., (1976), "A New Approach to the Agricultural Productivity Regions of the Sutlej-Ganga Plains-India", *Geographical Review of India*, 36, pp. 230-236.
5. Kendell, M.G., (1939), "The Geographical Distribution of Crop Productivity in England" *Journal of Royal Statistical Society*, 162, pp. 24-28.
6. Ramdhawa, M.S., (1975) *Green Revolution in Punjab*, Ludhiana, Punjab Agricultural University.
7. Sapre, S.G. and V.D. Deshpande, (1964), "Inter District Variations in Agricultural Efficiency in Maharashtra State", *Indian Journal of Agricultural Economics*, 19, pp. 242-252.
8. Shafi, M., (1972), "Measurement of Agricultural Productivity of the Great Plains", *The Geographer*, 19, pp. 4-13.
9. Shafi, M., (1974), "Perspective of Measurement of Agricultural Productivity", *The Geographer*, 21, pp. 6-8.
10. Singh, J., (1979) "Commercialization of Agriculture in Punjab: A Spatial Analysis", *Geographical Review of India*, 41.