



Spatial Analysis of Groundnut Sown Area in Karnataka During 1992 & 2002

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ABSTRACT

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 per capita annual consumption of edible oil in India has increased from 4.0kg in 1980-81 to 6.4 kg in 1996-97. The supply of vegetable oils has been rising annually at the rate of 5.96 % for consumption; even then it is not sufficing the need. This has made India to import edible oils to the extent of 1.30 million tons during 1985-86. During the year 1992-93 India had 25560.36n thousand hectares of land under cultivation of several oilseeds together. Amongst the Indian states Karnataka shared 1.56 % of sown area under major oilseeds, which being 5th largest state to share an area of 2699.70 thousand hectares of land, out of 25560.36 thousand hectares of land under oilseeds in India. During 2002-03 Karnataka had 1311445 hectares of land under all major oilseeds together, which is being 11.80 % of the total net sown area of 10393336 hectares of Karnataka.

Keywords : Edible Oilseeds, Groundnut, Sown area, Taluks, Percentage share.

STUDY AREA:

The state of Karnataka is confined within 11.350 to 18.300 north latitude and 74.510 to 78.350 east longitudes. The Karnataka state extends about 750 km from north to south about 400 km from east to west. The total land area of Karnataka is 119791 sq km. It accounts for 5.83% of the total area of India (32.88 lakhs sq km) and ranks 8th among Indian states in terms of geographical area. As per 2011 census, the state's total population is 61130704, sharing 5.05% of India's population of 1,21,01,93,422. Karnataka state has 30 districts consisting of 175 taluks and 27481 inhabited villages. Karnataka has 66.02% of rural population. While 33.98% is urban population. Out of total population 36.63% are main workers. The literacy rate in Karnataka is 67.84%, while sex ratio is 964 per 1000 males. The chief soil types found in the Karnataka state can be grouped under rich black soils, red soils, laterite and mixed coastal soils. In Karnataka state net sown area is 10393336 hectares which is 54.55% of total geographical area (19049836 hectares). About 14.66% land is used for forest, about 10.04% land is not available for cultivation, about 8.22% land is uncultivated and 9.17% land is as a fallow.

OBJECTIVES:

- 1) To examine the taluka wise percentage share of groundnut sown area in Karnataka during 1992
- 2) To examine the taluka wise percentage share of groundnut sown area in Karnataka during 2002
- 3) To make the taluka-wise data of percentage share of increase of sown area under groundnut oilseed crop (When compared to 1992-93 to 2002-03)

APPROACH AND METHODOLOGY:

The present study of oilseeds cultivation in Karnataka is a part of agricultural geography. The data for two periods i.e. 1992-93 and 2002-03 is considered for the analysis of 175 taluks. The published data is obtained from the following of fices:

- 1) District Statistical Office, Dharwad, 2) Department of Economics and Statistics Govt. of Karnataka, Bangalore, 3) Director, Department of Agriculture, Bangalore, 4) Joint Director, Department of Oilseeds, Bangalore, 5) University of Agriculture Science, Dharwad. The taluka wise percentage data of sown area under groundnut oilseed crop is shown on the map

by five groups viz very high, high, medium low and very low, with the help of mean and standard deviation method.

- 1) The taluka wise sown area in the form of percentage under groundnut oilseed is shown in the form of concentration map as per S.S Bhatia's method for the year 2002-03.
- 2) The taluka-wise data of percentage share of increase of sown area under groundnut oilseed crop (When compared to 1992-93 to 2002-03) is shown on the map.

SOWN AREA UNDER DIFFERENT OILSEED CROPS IN KARNATAKA, DURING 1992-93 and 2002-03

Table 1

SINo	Name of the oilseeds	Area 1992-93	%	Area 2002-03	%
	Groundnut	1239956	45.38	661244	50.42
2	Sunflower	1067586	39.07	452063	34.47
3	Safflower	162165	5.93	57361	4.37
4.	Sesamum	121108	4.43	44004	3.35
5.	Soya bean	41322	1.51	56077	4.27
6.	Linseed	43259	1.58	19994	1.52
7.	Castor	24188	0.88	11412	0.87
8.	Niger	27216	0.99	6581	0.50
9.	Mustered	5537	0.20	2588	0.19
	Total	2732337	99.98	1311324	99.96

TALUKA-WISE PERCENTAGE SHARE OF AREA SOWN UNDER GROUNDNUT DURING 1992-93

During the year 1992-93 the state of Karnataka witnessed normal annual rainfall as a result of which the area sown under all the oilseed crops is higher than that of the area sown during 2002-03 which witnessed deficit annual rainfall. During 1992-93 out of 175 taluks of Karnataka 168 taluks had area under groundnut cultivation, in the range of 0.56%, to 6.84%. It is not at all cultivated in seven taluks where heavy rainfall and hilly topography of western Ghats are not favourable for groundnut cultivation.

During 1992-93, seven taluks had more than 2.36% area under groundnut cultivation, appearing as very high share under groundnut cultivation. However, the maximum area under groundnut cultivation was to the extent of 6.84% in the taluk of Challakere (84960 hectarea). Out of 7 taluks of very high range of area under groundnut cultivation, one taluk i.e. Shorapur belongs to north Karnataka while remaining 6 taluks belong to Southa Karnataka, that too three taluks belong to Tumkur district, two taluks belong to Chitradurga district and one taluk belongs to Bellary district, where in all the seven taluks, red soil and irrigation extent have very well favoured to cultivate groundnut.

During 1992-93, thirteen taluks appeared as high range in sown area under groundnut cultivation, where the range of area under groundnut was 1.47% to 2.35%. These 13 taluks are Sindagi, Shahapur, Devadurga, Raichur, Ron, Yalaburga, Hukkeri, Gadag, and Shirahatti, of north Karnataka, while Koratageri, Kanakpur, Bagepalli and Molakalonor of South Karnataka, where shallow and red mixed black soils are suitable to groundnut cultivation.

The medium range of groundnut cultivation is found in 17 taluks of Karnataka where the share of groundnut cultivation varies between 0.89% to 1.46%. Among 17 taluks 8 taluks belong to Krishna and Malaprabha river basin, while 3 taluks viz Hadagali, H.B.Halli, and Koppal belong to Tungabhadra river basin, 2 taluks viz Jagalur and Chitradurga belong to Vedavati river basin 3 taluks viz Gouribidanur, Chintamani and Mulabagil belong to Pennar river basin and one taluk i.e. Kollegal belong to Kaveri river basin.

There are another 17 taluks during 1992-93, which show low range of area under groundnut cultivation. i.e. 0.57% to 0.88%. Out of 17 taluks 12 are in the north maiden region of Karnataka while remaining 5 are in southern region.

In the very low range of area under groundnut cultivation 114 taluks are identified (vide Map), where the area under groundnut cultivation is below 0.56%. Amongst 114 taluks 89 taluks are located in almost western half and southern Karnataka and central Karnataka, while remaining 25 taluks are spread over in the districts of Bidar, Gulbarga, Bijapur, Bagalkot, Raichur, Bellary and Belgaum (Table 2 fig 1)

PERCENTAGE SHARE OF THE SOWN AREA UNDER GROUNDNUT CULTIVATION COMPRISING OF 168 TALUKS DURING 1992-93.

Table 2

Category	Range	Number of Taluks
Very High	2.36% and above	7
High	1.47-2.36%	13
Medium	0.89-1.46%	17
Low	0.57-0.88%	17
Very Low	Below 0.56%	114
	Total	168 Taluks

TALUKA-WISE PERCENTAGE SHARE OF AREA SOWN UNDER GROUNDNUT DURING 2002-03

Due to failure of south-west Monsoon during-2002-03 the area under groundnut cultivation was reduced in various taluks of Karnataka, consequently there was no cultivation of groundnut in 36 taluks, while this number was only 7 in 1992-93.

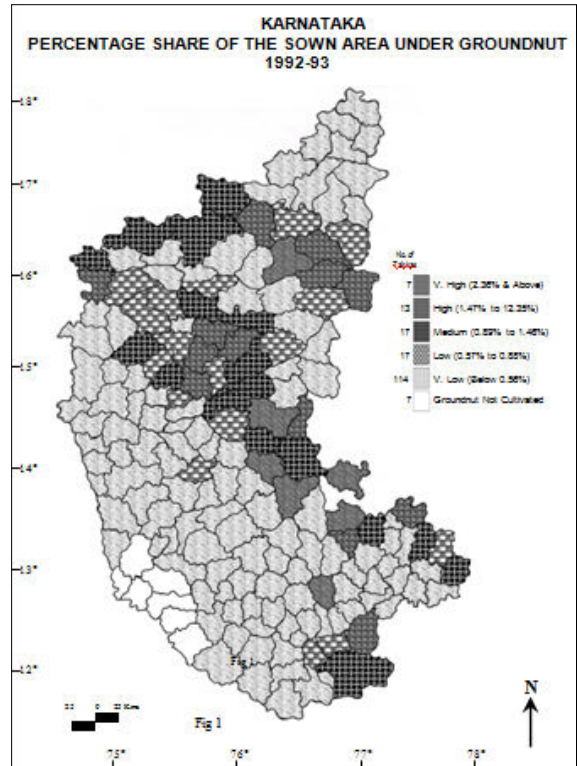
Under very high range of groundnut cultivation 5 taluks are identified where the area under groundnut is ranging from 3.60 to 14.78%. Out of these 5 taluks 2 taluks Viz Shorapur and Shirahatti are in the Northern Karnataka and 3 taluks Viz Challakere, Pavagad and Shira are in South Karnataka, where red soils and irrigation have favoured the groundnut cultivation.

Under high range 7 taluks are noticed where the area under groundnut varies from 2.09% to 3.59%. Out of them 4 taluks

viz Lingasur, Ron, Yalaburga and Chikkodi are in Northern Maidan while 3 taluks Viz Molakalmur, Hiriyr and Madhugiri are in Southern Maidan.

Under medium range of groundnut cultivated area 11 taluks are identified, where the area ranges from 1.51% to 2.08%. Amongst 11taluks 10 taluks belong to Northern Karnataka while one taluka i.e. Kollegal belongs to Southern Karnataka.

Under low range of groundnut cultivation 16 taluks are identified where groundnut area ranges from 0.57% to 1.50%. Amongst 16 taluks 3 taluks Viz Chitradurga, Koratagera and



Gundlupet are in South Karnataka, while remaining 13 taluks are spread over the Northern Karnataka.

There are 100 taluks under very low range of groundnut cultivation where they possess less than 0.56% of land under groundnut cultivation. These are located except the western parts of Karnataka and a few taluks in extreme south east Karnataka where heavy rainfall and scarcity rainfall respectively are not conducive for groundnut cultivation.(Table 3 Fig 2)

PERCENTAGE SHARE OF THE SOWN AREA UNDER GROUNDNUT CULTIVATION COMPRISING OF 139 TALUKS DURING 2002-03.

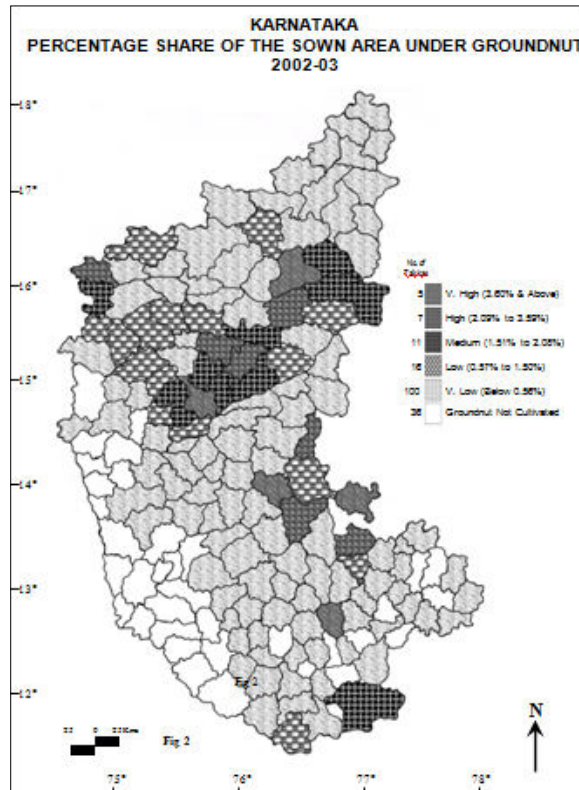
Table -3

Category	Ranges	Number of Taluks
Very High	3.60and above%	5
High	2.09-3.59	7
Medium	1.51-2.08	11
Low	0.57-1.50	16
Very Low	Below -0.56	100
	Total	139 taluks

CROP CONCENTRATION METHOD: (AS PER S. S. BHATTIA METHOD)

Crop concentration means the variations in the density of sown area of any crop in a region at a given point of time. The concentration of a crop in an area largely, depends on its ter-

rain, temperature, moisture and pedological conditions. Each crop needs a maximum, minimum and optimum temperature. It has a tendency to have high concentration in the areas of ideal agro-climatic conditions and the density declines as the geographical conditions become less conducive. It is because of the instability of agro-climatic conditions that cotton has high concentration in the black earth (regur) region, wheat dominates in Punjab and Haryana, bajra in Rajasthan and rice is the leading crop in Assam, West Bengal, Orissa, coastal Andhra Pradesh, Tamil Nadu and Kerala. Delineation of crop concentration region helps in ascertaining the areas where a particular crop grows well even with the help of minimum inputs, and thus has great significance for agricultural development and planning.



LOCATION QUOTIENT METHOD OF CROP CONCENTRATION:

The location quotient technique has also been applied by geographers for the determination of regional character of cropping patterns. In this technique the regional character of crop distribution is investigated and determined, first by comparing the proportion of sown area under different crops and ranking them, and secondly, by relating the crop density in each of the component areal units of the region/country to the corresponding density of the region/country as a whole. This approach makes it possible to measure the regional concentration of the crops objectively. It also helps to identify and differentiate areas that have some significance with regard to the crop distribution within the region.

The location quotient method may be expressed as under: Index for the determination of crop concentration =

$$\frac{\text{Area of x crop in the component areal unit.}}{\text{Area of all crops in the component areal Unit}} \div \frac{\text{Area of x crop in the entire region/country}}{\text{Area of all crops in the entire region/country}}$$

By applying the above technique, if the index value is greater than unity, the component areal unit accounts for

a share greater than it would have had if the distribution were uniform in the entire region, and therefore, the areal unit has a concentration of great agricultural significance. After ascertaining the index values for the crops in the component areal units, they are arranged in an ascending or descending order. The index scale is calculated by dividing the array into equal parts to distinguish the very high, high, medium, low and very low concentrations. In general, higher the crop concentration index, higher is the level of interest in the production of that crop.

The main advantage of the location quotient technique for the delineation of crop concentration lies in the fact that it enables the geographers and planners to understand the areas of specialization of different crops grown in a region at a given point of time. The continuous cultivation of a particular crop in a unit or region, however, leads to progressive reduction in yield. This depletion of soil happens because the crop exhausts certain nutrients from the soil. Consequently, the natural fertility of the soil steadily declines. Rotation of crops with diverse choice, permissible under the given environmental conditions, therefore, needs to be adopted to maintain the fertility of the soil. A scientific rotation of crops not only makes agriculture a more remunerative occupation, but it also makes the agro-ecosystem more resilient and sustainable.

GROUNDNUT CONCENTRATION IN KARNATAKA:

The map of concentration of groundnut cultivated area for the year 2002-03 shows the following 4 taluks Viz Molakalmur, Challakere, Pavagad, and Madhugiri as Very high concentration. All these 4 taluks belong to south Karnataka and also located in red soil zone.

There are 9 taluks viz Chikkodi, Hukkeri, Shorapur, Shirahatti, yalaburga, Hiriyur, Koratageri, Shira and Kollegal which have shown during 2002-03 as high concentration of groundnut cultivation.

The following 4 taluks Viz Devadurga, Mundaragi, Savanur and Kundagol located in Northern Karnataka appear as medium concentrated under the area of groundnut cultivation. It can also be noted here that these 4 taluks have shallow black soils.

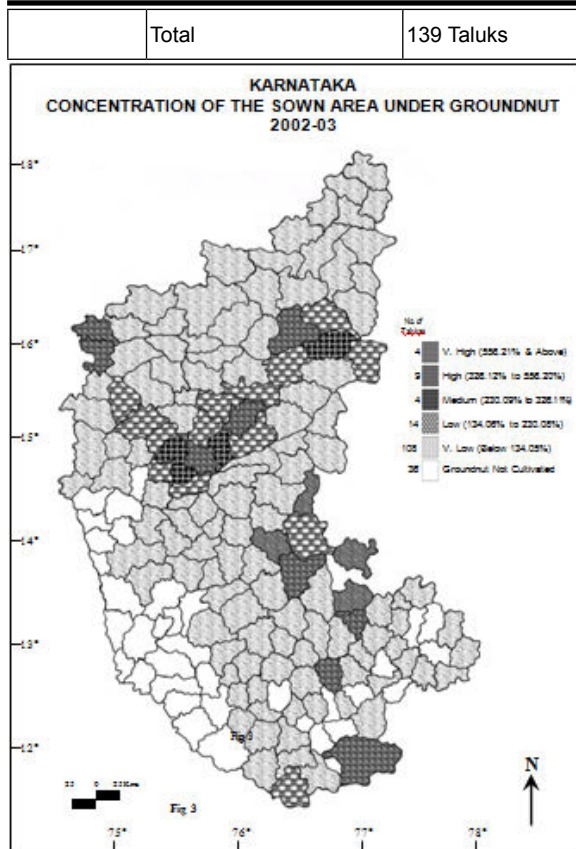
The following 14 taluks Viz Raichur, Shahapur, Lingasur, Kustagi, Ron, Koppal, Gadag, Bailahongal, Dharwad, Hubli, Shiggaon and Haveri, located in north Karnataka while chitradurga and Gundlupet located in South Karnataka show low concentration of area under Ground nut cultivation.

There are 108 taluks which appear as very low concentration in area under groundnut cultivation and these are spread across the Karnataka except in the western Ghats and the Coastal region. Further it is to be noted here that these 36 taluks where Groundnut is not cultivated at all and such taluks are in the western Ghats and Coastal area and a very few are in the Southern margins of Karnataka (refer Table 4 Fig 3)

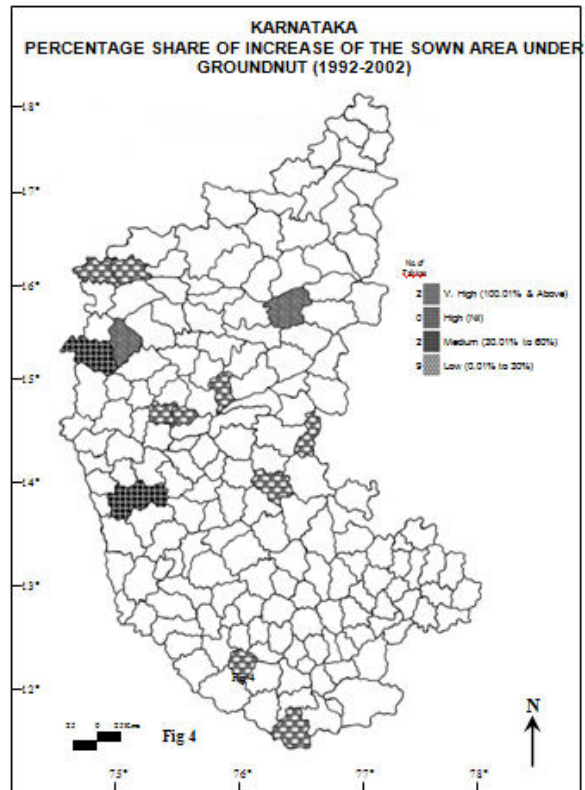
GROUNDNUT CONCENTRATION IN KARNATAKA

Table 4

Category	Range	No of Taluks
very high	556.21 and above	4
High	326.12 to 556.20	9
Medium	230.06 to 230.08	4
Low	134.06 to 230.08	14
Very Low	134.05 and below	108



2. Bailahongal	3392	8258	4866	143%
3. Sagar	226	347	121	54%
4. Khanapur	2363	3178	815	34%
5. Chikkodi	14594	17830	3236	22%
6. Piriyaipattan	37	44	7	19%
7. Rayabag	970	1135	165	17%
8. Challakere	84960	97725	12765	15%
9. Molakalmur	20389	23394	3005	15%
10. Savanur	9383	10004	621	7%
11. Gundlupet	5414	5762	348	6%
12. Shiggaon	4254	4496	242	6%
13. Mundaragi	10826	10904	78	1%



PERCENTAGE SHARE OF INCREASE OF THE SOWN AREA UNDER GROUNDNUT CULTIVATION WHEN COMPARED FROM 1992-2002.

The map reveals that two taluks Viz Bailahongal and Lingasur as exceptionally high in terms of increase of area under groundnut cultivation when compared from 1992 and 2002, where these two taluks show more than 100% increase in the area i.e. Bailahongal from 3392 hectares to 8258 hectares and Lingasur from 4933 hectares to 15118 hectares. The actual net sown area in Bailahongal taluk is 115752 hectares out of which area a under groundnut cultivation is 8258 hectares (7.13%) during 2002-03. In case of Lingasur taluk the net sown area during 2002-03 was 157640 hectares, of which groundnut cultivation area was 15118 hectares.

Two taluks namely Khanapur and Sagar have shown 34% to 54% increase respectively in area under groundnut cultivation from 1992-2002. The actual area under groundnut in Khanapur taluk was 2363 hectares in 1992 and 3178 hectares in 2002, while Sagar taluk had 226 hectares during 1992 and 347 hectares during 2002, and appear as mediumly increase.

The 9 taluks viz Chikkodi, Rayabag Shiggaon, Savanur, Mundaragi, Molakalmur, Challakere, Piriyaipattan and Gundlupet Show 0.01% to 30% increase in the area of groundnut cultivation when compared to 1992-2002 and appear as low increase on the map (vide Map)

There are 162 taluks on the map that show no increase in the area of groundnut cultivation, where 36 taluks having no area under groundnut cultivation are also included.(Table 5, Fig.4)

PERCENTAGE SHARE OF INCREASE OF SOWN AREA UNDER GROUNDNUT WHEN COMPARED FROM 1992-2002 (Area in hectares)

Table 5

No of Taluks	Area 1992	Area 2002	Actual changes	%
1. Lingasur	4933	15118	10185	206%

CONCLUSION:

Karnataka has favorable conditions for the cultivation of groundnut in 168 taluks, where it is cultivated in very high percentage to very low percentage. If rain fails in some taluks and if irrigation has provided in such taluks then groundnut cultivation can be high yielding and farmers can feel secured and assured to cultivate groundnut on higher acreages. In this regard all the 168 taluks can be considered for further thrust on the development of groundnut cultivation. In order to know the importance of cultivation of each type of oilseed crops cultivated in the taluks of Karnataka, the award of ranking was done from highest area under particular types of oilseeds cultivation to the least area. The groundnut is cultivated in 139 taluks of Karnataka during the study period 2002-03. In the remaining 36 taluks of Karnataka groundnut is not at all cultivated, amongst which 25 taluks are not suitable for groundnut cultivation due to excess rainfall while in the remaining 11 taluks groundnut cultivation which was observed in 1992-93 is shifted to food grain crops like ragi and thus the 11 taluks even though are suitable for groundnut cultivation are not considered for groundnut cultivation as per the farmers preference during & 2002-03.

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