

Farm Size and Cropping Pattern: A Case Study of Dharwad District in Karnataka State

R. G. Kadapatti¹, S. T. Bagalkoti²

¹Research Scholar, Department of Studies in Economics, Karnatak University, Dharwad, India

²Faculty, Department of Studies in Economics, Karnatak University, Dharwad, India

Correspondence: R.G. Kadapatti, Research Scholar, Teacher Fellow on FIP, Department of Studies in Economics, Karnataka University, Dharwad

Abstract: *Cropping pattern comprehends both time and sequence of crops. It includes identification of the most efficient crops of a region which is considered homogeneous soil and crops fits and the intensity of cropping. A change in cropping pattern implies a change in the proportionate area under different crops. An increase in the area under high value crop is likely to result in an increase in total return even if there is no increase in the yield rate or price provided there is simultaneous decrease in the proportionate area under equally or more valuable crops. Farm size is a major factor in influencing the cropping pattern. Small farms dominate agricultural economy of most of the developing countries including India. Small farmers are largely poor and depend upon their farms for their sustenance. Hence, they go in for food crops on these small farms in preference commercial crops. Medium and large farmers diversify their cropping and devote a good part of their farms for different crops. The study has revealed that area under food crops has gone up in small, medium and large farms in Dharwad district. However, area under cereals has declined under small and medium size farms. Similar is the case with regard to condiments and spices. Area under fruits has gone up but area under vegetables has declined marginally in small, medium and large size farms in the district. Area under oilseeds has gone up considerably under small, medium and large size farms. Price variations and income factors seem to have influenced cropping pattern in the study area apart from natural factors like rainfall and climate.*

Keywords: Farm Size, Small Farms, Cropping Pattern, Diversification, Food Crops, Non Food Crops

1. Introduction

Cropping pattern is a spatial and temporal arrangement of crops to be raised in a parcel of land (Harwood, 1973). The term cropping pattern comprehends both time and sequence of crops. It includes identification of the most efficient crops of a region which is considered a homogeneous soil and climate belt, the rotation in which the crop fits and the intensity of cropping. In other words cropping pattern refers to the relative arrangements of crops on a farm, region province or country with due consideration to natural features (soil and climate), crop production, land capability, infrastructure and the nation's agricultural policy (Mahendra Pal, 1985). Cropping pattern thus refers to the proportion of area under different crops at a point of time.

2. Objectives of the Study

The study has the following objectives

- 1) To study the conceptual and practical implications of cropping pattern
- 2) To examine the relationship of farm size and cropping pattern at a macro level
- 3) To analyze the cropping pattern of farms of different size in the study area of Dharwad district during 2000-01 to 2005-06.

3. Current Study: Implications of Change in Cropping Pattern

A change in the cropping pattern implies a change in the proportionate area under different crops. An increase in the

area under high value crop is likely to result in an increase in total return even if there is no increase in the yield rate or price provided there is simultaneous decrease in the proportionate area under other equally or more valuable crops. A change in the cropping pattern could be either advantageous or disadvantages according to the nature of the change. A predominantly food grains oriented cropping pattern a substantial increase in the proportion of area under the crops other than food grains might be taken as a radical change and for the reason that commercial crops generally command a larger return percent of cultivated area. Such a change may also turn out to be beneficial from the point of view of the farmers.

Size of Farm as an Influencing Factor on Cropping Pattern

Farm size is a major or factor influencing the cropping pattern. It is found from various studies that small farms dominate the agricultural economy of most of the developing countries. In developing countries like India small farmers are largely poor and depend upon these farms for their sustenance. Hence they go in for food crops on these small farms in preference to commercial crops since food grains constitute the major expenditure items in their lives and account for the major part of the their income. Hence small farmers have little option for commercial crops and prefer to grow cereals and other food grains on their farms. Medium and large farmers diversify their cropping and devote a good part of their farms for different crops to enhance their farm income through diversification of their agriculture.

Farm Size and Cropping Pattern in Dharwad District

The study is designed to examine the dimensions of cropping dynamics in Dharwad district during the 5 years from 2000-01 to 2005-06, as the latest data on cropping pattern of different size holdings in Dharwad district is available up to the period of 2005-06. The II Phase report of agricultural census of 2010-11 on characteristics of land holdings in Dharwad district is not realised by the Department of Agriculture and Co-operation, Government of India.

4. Methodology

The study area covers Dharwad district in the northern part of Karnataka State. The district is largely agricultural oriented growing varieties of agricultural produce comprising cereals and other food crops, and oil seeds etc. The study covers three type of farm sizes viz., small farms (up to 2 hectare), medium farms (2 to 10 hectare) and large farms (more than 20 hectare). Cropwise the study has covered 6 cereal crops, 3 pulses crops, 5 condiments and spices, 5 fruits crops, 6 vegetable crops, 5 oil seed crops, and cotton and floriculture. The analysis is based on the secondary data obtained from Agricultural Census Reports (2012) of the Government of India. Changes in the area under different crops during the 5 years from 2000-01 and to 2005-06 have been indicated through the percentage figures of area under different crops as indicated in the table 1.

5. Findings and Discussion

Table 1 reveals the share of principal crops in gross cropped area of Dharwad district during 2000-01 to 2005-06. For the analysis principal crops were selected on the basis of their percentage of cropped area in relation to gross cropped area. Table 1 and Figure 1 represent the percentage share of food and non food crops under gross cropped area of the district. Greater share of food crops

i.e., near to 70 percent is observed and there is 28-30 percent share of non-food crops among different size of land holdings. In case of all size holdings the percentage of share of food crops is 69% and non food crops account for remaining 31 percent in 2005-06. The percentage share of food crops in case of small holdings is 68 percent and in case of medium and large holdings it is 70 percent. There is marginal decrease in share of food crops in case of small and all size holdings and marginal increase in share of food crops in case of medium and large holdings during above said period.

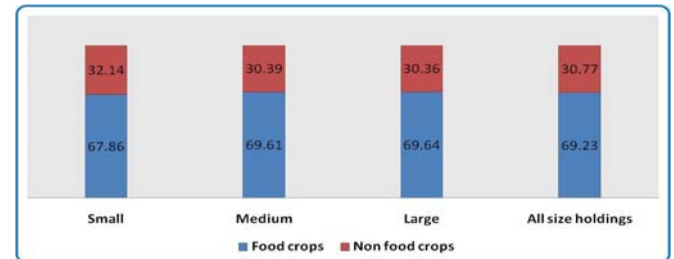


Figure 1: Percentage Share of Food and Non Food Crops in Gross Cropped Area of Dharwad District in 2005-06
Source: GOI 2012, Agricultural Census Reports: 2000-01 and 2005-06.

Among food crops there is dominant share of cereals followed by pulses, condiments and spices and vegetables. In case of gross cropped area of small holdings the share of cereals is 32.25 percent followed by pulses with 15.60 percent, condiments and spices with 12.39 percent, vegetables with 6.56 percent in 2005-06 (Figure 2) There is also dominant share of cereals followed by pulses, condiments and spices, vegetable in case of gross cropped area of all size holdings with the percentage share of 31.91 percent, 16.79 percent, 12.12 percent and 7.24 percent respectively during the same period (Figure 3). There is negligible share of sugar crops and fruits in gross cropped area of small holdings and all size holdings also.

Table 1: Percentage Distribution of Gross Cropped Area under Principal Crops in Dharwad District (in %)

Sl No.	Crops	Small Holdings		Medium Holdings		Large Holdings		All Size Holdings	
		2000-01	2005-06	2000-01	2005-06	2000-01	2005-06	2000-01	2005-06
1	Paddy	13.03	10.45	8.75	6.74	4.14	4.41	9.07	7.23
2	Jowar	10.14	8.67	9.82	9.45	9.76	10.78	10.12	9.47
3	Bajra	0.15	0.15	0.23	0.14	0.19	0.05	0.21	0.13
4	Maize	4.11	5.86	5.29	6.45	4.01	4.26	4.87	6.01
5	Ragi	0.65	0.15	0.99	0.18	0.68	0.18	0.88	0.17
6	Wheat	6.63	6.54	8.36	8.70	8.75	10.04	8.04	8.41
7	Total Cereal (1+2+3+4+5+6+ other cereals)	35.13	32.25	34.32	32.16	27.83	30.30	33.65	31.91
8	Bengal Gram	4.98	7.10	6.10	7.84	6.98	9.32	5.98	7.89
9	Tur	0.61	0.30	0.72	0.48	0.79	0.51	0.70	0.44
10	Moong	5.95	7.57	5.97	7.90	5.80	7.76	5.94	7.81
11	Total pulses (8+9+10+ other pulses)	12.45	15.60	13.78	16.91	14.47	18.13	13.59	16.79
12	Total food grains (7+11)	47.58	47.84	48.11	49.07	42.30	48.43	47.24	48.71
13	S cane	0.36	0.36	0.30	0.47	0.28	0.27	0.31	0.42
14	Total sugar crops	0.36	0.37	0.30	0.47	0.28	0.27	0.31	0.42
15	Chillies	13.36	11.89	12.83	11.31	15.74	12.30	13.32	11.58
16	Ginger	0.06	0.07	0.04	0.08	0.12	0.01	0.05	0.07
17	Garlic	0.26	0.15	0.28	0.24	0.29	0.33	0.28	0.23
18	Coriander	0.12	0.02	0.12	0.02	0.11	0.04	0.12	0.02
19	Total condiments & spices (15+16+17+18+ other)	14.08	12.39	13.64	11.85	16.65	12.90	14.12	12.12

	condimental & spices)								
20	Mangoes	0.27	0.39	0.34	0.54	0.30	0.39	0.32	0.48
21	Banana	0.01	0.06	0.03	0.03	0.06	0.00	0.03	0.03
22	Chikku	0.14	0.15	0.11	0.18	0.15	0.07	0.12	0.16
23	Table Grapes	0.01	0.15	0.02	0.18	0.01	0.07	0.01	0.16
24	Guava	0.04	0.07	0.05	0.03	0.06	0.01	0.05	0.04
25	Total fruits (20+21+22+23+ 24+ other fruits)	0.51	0.70	0.59	0.81	0.64	0.49	0.58	0.74
26	Potato	1.17	0.09	0.93	0.10	0.56	0.09	0.93	0.10
27	Onion	5.38	5.96	6.88	6.85	7.50	7.30	6.64	6.72
28	Tomato	0.15	0.08	0.10	0.05	0.05	0.01	0.10	0.05
29	Brinjal	0.02	0.04	0.02	0.04	0.03	0.01	0.02	0.03
30	Cucumber	0.03	0.01	0.02	0.01	0.01	0.00	0.02	0.01
31	Green chillies	0.23	0.21	0.25	0.16	0.14	0.05	0.23	0.15
32	All vegetables (26+27+28+ 28+29+30+31+ other fruits)	7.25	6.56	8.42	7.41	8.40	7.56	8.17	7.24
33	Total food crops (12+14+19+25+ 32)	69.90	67.86	71.28	69.61	68.38	69.64	70.61	69.23
34	Groundnut	7.48	8.30	7.08	8.45	7.82	9.42	7.26	8.56
35	Coconut	0.11	0.13	0.08	0.13	0.08	0.07	0.09	0.12
36	Sunflower	0.23	0.95	0.29	1.41	0.92	1.78	0.36	1.36
37	Safflower	0.78	0.77	0.90	0.99	1.18	1.22	0.91	0.98
38	Soyabean	0.87	4.23	0.75	2.97	0.35	1.34	0.72	3.02
39	Total oil seeds (34+35+ 36+37+38+ other oilseeds)	9.61	14.56	9.24	14.12	10.49	14.12	9.48	14.22
40	Cotton	19.66	17.30	18.31	15.84	19.52	15.71	18.75	16.14
41	Total fibres	19.72	17.31	18.37	15.87	19.57	15.75	18.81	16.18
42	Rose	0.03	0.06	0.01	0.04	0.00	0.01	0.01	0.04
43	Total Floriculture crops (40+ other flowers)	0.03	0.06	0.02	0.06	0.00	0.01	0.02	0.05
44	Total non food crops (39+41+43)	30.10	32.14	28.72	30.39	31.62	30.36	29.39	30.77
45	Gross cropped area (in ha) (33+44)	96934	111106	298273	317952	58869	71536	454076	500593
		100	100	100	100	100	100	100	100
46	Net area sown	69023	75643	219568	218495	44349	49370	332940	343507
47	Intensity of cropping (45/46*100)	140.44	146.88	135.85	145.52	132.74	144.90	136.38	145.73

Source: GOI 2012, Agricultural Census Reports: 2000-01 and 2005-06.

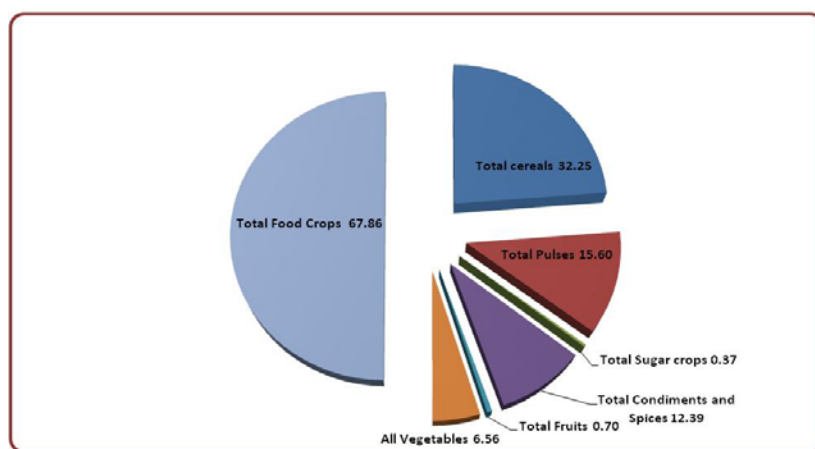


Figure 2: Share of Major Crops in Total Food Crops of Small Holdings (in % / 2005-06)

Source: GOI 2012, Agricultural Census Reports: 2000-01 and 2005-06

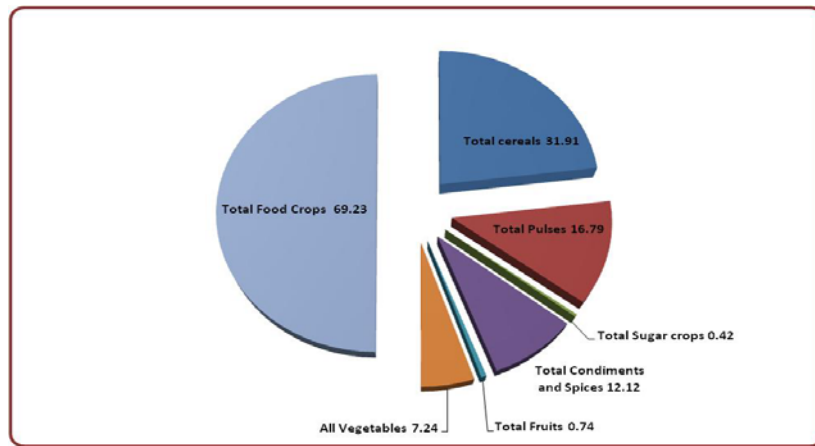


Figure 3: Share of Major Crops in Total Food Crops of All Size Holdings (in % / 2005-06)

Source: GOI 2012, Agricultural Census Reports: 2000-01 and 2005-06

Among non food crops there is major share by oil seeds followed by fibres. There is negligible share of horticulture and floriculture crops. The share of oil seeds and fibres is 14.56 percent and 17.31 percent in gross cropped area of small holdings (Figure 4) and the share of same crops in

case of gross cropped area of all size holdings it is 14.22 percent and 16.18 percent respectively in 2005-06 (Figure 5).

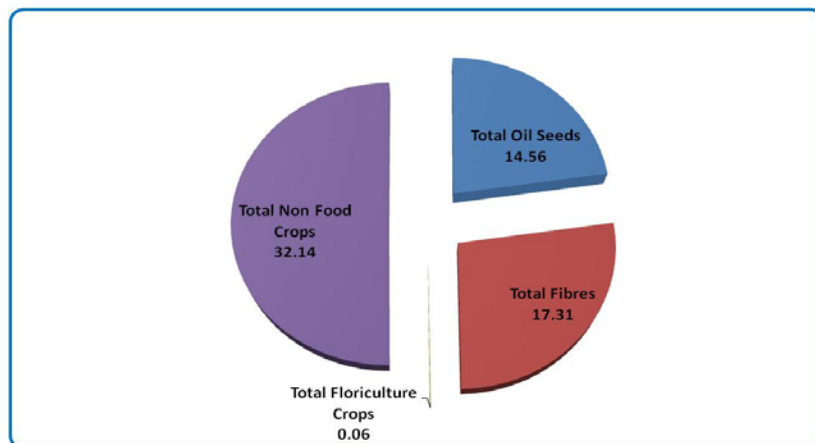


Figure 4: Share of Major Crops in Total Non Food Crops of Small Holdings (in % / 2005-06)

Source: GOI 2012, Agricultural Census Reports: 2000-01 and 2005-06

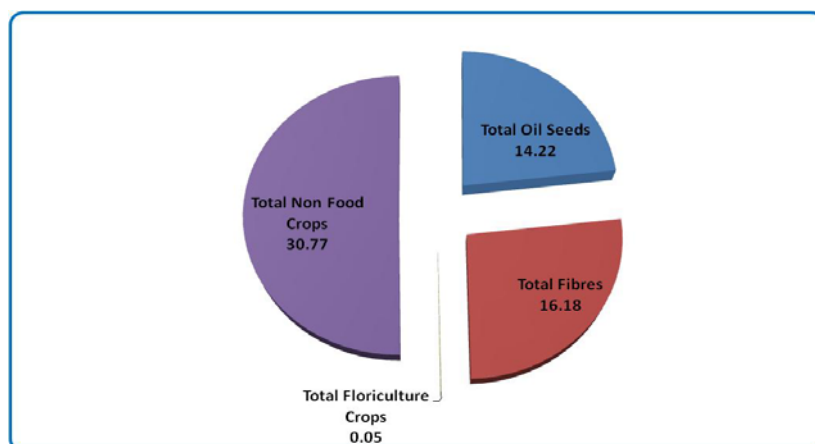


Figure 5: Share of Major Crops in Total Non Food Crops of All Size Holdings (in % / 2005-06)

Source: GOI 2012, Agricultural Census Reports: 2000-01 and 2005-06

Among gross cropped area of cereals (32.25% share) there is dominant share by Paddy (10.45%) followed by Jowar (8.67%), Wheat (6.54%) and Maize (4.11%) in case of small holdings and in case of gross cropped area of cereals of all size holdings there is dominant share by Jowar followed by Wheat, Paddy and Jowar with 9.47 percent, 8.41 percent, 7.23 percent and 6.01 percent share respectively in 2005-06. The position of percentage share of these crops is also same in medium and large holdings as in all size holdings. There is negligible share of Bajra, Ragi and minor millets in gross cropped area of all different size holdings.

Among pulses (15.60%) there is major share of Moong and Bengal Gram in gross cropped area of small holdings i.e. 7.50 percent and 7.10 percent in 2005-06. In this case the share of Tur is less than 1 percent and share of other pulses is negligible. In gross cropped area of all size holdings among pulses there is greater share of Moong followed by Bengal Gram i.e. 7.89 percent and 7.81 percent respectively. In case of medium holdings there is

dominant share of Bengal gram and in large holdings there is major share of Moong.

There is more than 90 percent share of Sugarcane in gross cropped area of sugar products in all different size holdings in 2005-06. Similarly, in gross cropped area of condiments and spices there is 90 percent share of Chillies and least share of Garlic and Coriander and negligible share of Ginger and other crops in all holdings. As said in above the share of fruits in gross cropped area is negligible i.e. less than 1 percent. Among fruits there is greater share of Mangoes followed by Chikku in all holdings. Similarly, in among gross cropped area of vegetables there is 80-90 percent share is by Onion and least share is by Potato and negligible share is by Tomato, Brinjal, Cucumber and other vegetable crops in all holdings.

Figure 6 shows the overall cropping pattern and change in cropping pattern of small holdings during 2000-01 to 2005-06 in Dharwad district.

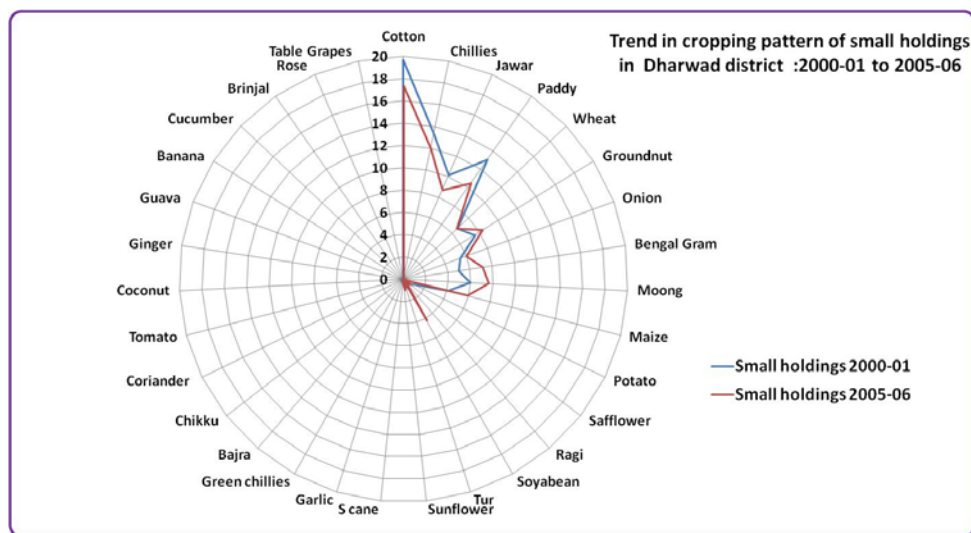


Figure 6: Cropping Pattern of Small Holdings in Dharwad District

Source: GOI 2012, Agricultural Census Reports: 2000-01 and 2005-06

Under the gross cropped area of small holdings, Cotton was the most dominant crop having a share of 19.66 percent followed by Chillies (13.36%), Paddy 13.03%, Jowar (10.14%), Groundnut (7.48%), Wheat (6.63%), Moong (5.95%), Onion (5.38%), Bengal Gram (4.98%), Maize (4.11%), Potato (1.17%), Soyabean (0.87%) and share of other crops is less than 1% in 2000-01.

There is little change in ranking of these crops in sharing gross cropped area of small holdings in 2005-06. In this period again Cotton accounted for highest share of 17.30 percent, followed by Chillies (11.89%), Paddy (10.45%), Jowar (8.67%), Groundnut (8.30%), Moong (7.57%), Bengal Gram (7.10%), Wheat (6.54%), Onion (5.96%), Maize (5.86%), Soyabean (4.23%) and share of other crops is less than 1 percent.

During 2000-01 to 2005-06 there is decreased share of Cotton, Chillies, Paddy, Jowar, Wheat and Potato in gross cropped area of small holdings. During the same period

there is increased share of Groundnut, Moong, Onion, Bengal gram, Maize and Soyabean in gross cropped area of small holdings. Among these crops there is considerable increase in share of Moong, Bengal gram and Soyabean. Hence there is changing cropping pattern towards Moong, Bengal gram and Soyabean. Therefore there is no diversification in cropping pattern by small holdings towards high value crops like fruits, flowers, vegetables.

Figure 7 shows the overall cropping pattern and change in cropping pattern of all size holdings during 2000-01 to 2005-06 in Dharwad district. Under the gross cropped area of all size holdings, greater share is accounted by Cotton with 18.75 percent, followed by Chillies (13.32%), Jowar (10.12%), Paddy (9.07%), Wheat (8.04%), Groundnut (7.26%), Onion (6.64%), Bengal Gram (5.98%), Moong (5.94%), Maize (4.87%) and sharing of other crops negligible i.e., less than 1 percent in 2000-01.

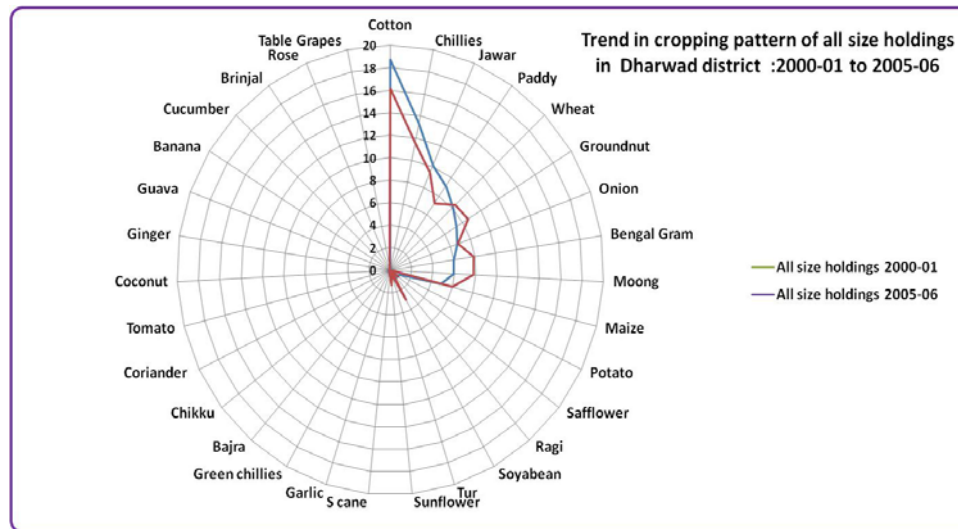


Figure 7: Cropping Pattern of All Size Holdings in Dharwad District

Source: GOI 2012, Agricultural Census Reports: 2000-01 and 2005-06

Again there is little change in ranking of these crops in sharing gross cropped area of all size holdings in 2005-06. In this period again Cotton accounted for highest share of 16.14 percent, followed by Chillies (11.58%), Jowar (9.47%), Groundnut (8.56%), Wheat (8.41%), Bengal Gram (7.89%), Moong (7.81%), Paddy (7.23%), Onion (6.72%), Maize (6.01%), Soyabean (3.02%), Sunflower (1.36%), Safflower (0.98%) and share of other crops is less than 1 percent.

During 2000-01 to 2005-06 the share of some crops is decreased viz., Cotton, Chillies, Jowar and Paddy. And share of some crops is increased viz., Wheat, Groundnut, Onion, Bengal Gram, Moong, Maize and Soyabean. Among these crops there is considerable increase in share of Bengal gram, Moong, Maize and Soyabean. Therefore in case of all size holdings also there no cropping diversification towards high value crops like fruits, flowers, vegetables, etc.

6. Conclusion

Medium size farms in Dharwad district had larger cropped area in 2005-6 followed by small and large size farms. Area under food grains has gone up in all the three size of farms during the five years. The increase is higher in large farms. However the area under cereals crops has declined under small and medium size farms. Area under condiments and spices has declined in all the three size of farms. Area under fruits has gone up in small and medium size farms but has declined under large size farms. There is a marginal decline in the area under vegetables in all the three type of farm sizes. Area under oilseeds has gone up considerably under the three sized farms-small, medium and large. Area under floriculture too has gone in the three type of farms-small, medium and large. Price variations and income factors seem to have influenced the change in the cropping pattern in the district.

References

- [1] Harwood, R.R. (1973): Increasing Food Production through Multiple Cropping, *Paper presented at the Multiple Cropping Workshops*, 18-20 September, Indonesia.
- [2] Mahendra Pal, Singh K.A., Saxena J.P. and Sing H.K. (1985): Energetic of Cropping systems, *Indian Journal of Agronomy*, 30(2):1-L (xi).
- [3] Government of India (2012): Agricultural Census Reports from 2000-01 and 2005-06. Agricultural Census Division, Department of Agriculture and Co-operation, New Delhi