Spatio-Temporal Analysis of Size of Holdings in the environs of Malaprabha River Basin, Karnataka State, India

Dr. S. L. Chitragar
Associate Professor in Geographyand Awardee of Teacher Fellowship
MES's Arts and Commerce College, Mudalgi-591312 (Dist: Belagavi)

Introduction:

Land is a free gift of nature with fixed supply and is basic asset of an agrarian economy, is a prerequisite for cultivation, the major source of income and an index of household status. It is associated with control over and access to other resources. The agrarian structure of a region describes the relative position of different category of farmers with respect to ownership and operation of land. Since land constitutes the most important income generating asset of the rural people, a change in the agrarian structure due to landholding pattern reflects relative prosperity of the destitute of different sections of rural population.

The size of a farm is a matter of great importance to success in agricultural and for accelerating agricultural production by applying modern farm technology. A new concept in Indian agriculture has been introduced where a census operation centered round the operational holdings. Such a survey was first time conducted in 1970-71. In this basin, more than 87.4 percent of rural workers are engaged in farming, in which more than 60.0 percent are classed as cultivators. In absence of opportunities of other occupations sole reliance on land is legitimate, and it causes further subdivisions of land holdings into tiny scattered plots. Land, like other assets, is inherited private property and fathers land is equally divided among his children, mostly among sons, keeping in view the fertility and location of land. This unending process is still running and there is no such thing as a permanent farm. The size of holding is thus determined by the law of succession and increasing burden and dependency of population on land, and not by the socio-economic conditions in accordance with the type of farming practiced. Thus, the size of holding is bound to vary spatially and temporally. An attempt has been made a spatio-temporal analysis of size of operational holdings in the environs of Malaprabha river basin, Karnataka state, India.

Study Area:

The Malaprabha River Basin of Karnataka state is approximately triangular shape, located in the extreme western part of the Krishna basin. It lies between $15^0\ 05^1\ 02^{ll}$ to $16^0\ 20^1\ 19^{ll}$ N. latitudes and $74^0\ 05^1\ 43^{ll}$ to $76^0\ 05^1\ 33^{ll}$ E. longitudes, covering an area of 11549 sq.km, out of which 3880 sq.km in Belgaum (33.59%), 1950 sq.km in Bagalkot (16.89%), 2739 sq.km in Dharwad (23.72%), 2657 sq.km in Gadag, 220 sq. km in Koppal and 103 sq. km in Haveri District (23.01%) [Fig-1]. Topographically the Malaprabha river basin presents the two important divisions, viz. Western Ghats

and typical of the eastern part of Deccan/Karnataka plateau with the distinct characteristics. The plateau has two natural sub divisions, the Semi-Malnad and the Northern Maidan, which include the northern upland or the Deccan trap of the state. The river Malaprabha is the most important right bank tributary of the river Krishna. The Benni hall, Hire hall and others are the principal tributaries of the Malaprabha River.

Fig- 1 LOCATION MAP OF MALAPRABHA RIVER BASIN
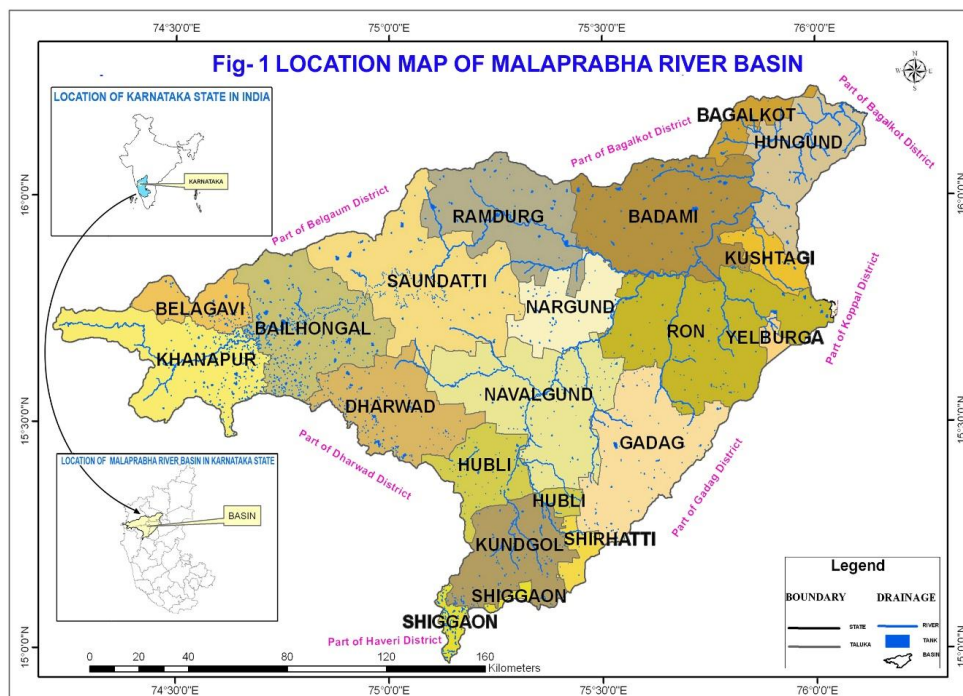
The entire river basin experiences a very warm during summer, especially in April and May, with temperature ranging between 35^0 to 40^0C in eastern part of river basin. The annual normal rainfall of the Malaprabha basin area is over 759 mm spread over 50 days, which receives monsoon rainfall as much as our nation with slight variations. Geographically ubiquities deep black cotton soils, unpredictable monsoonal rainfall, droughts and famines are part of life of people in the study region. The present study is a natural region, as per 2011 census, the population of Malaprabha River Basin is 3.38 million (5.53% of the state's total population) of which 77.66% is rural and 22.34% is urban inhabitants. The dominance of rural population makes the regional economy mainly agrarian. The basin's 68.37% of the workforce (61.75% of males and 79.55% of females), however, is still dependent on the agriculture and its allied activities for their livelihood.

Objectives:

The present study has been undertaken with the following specific objectives:

1. To study the distributional pattern of operational land holdings and their area in the environs of the river basin (2010-11);

2. To describe the spatial distribution (talukas-wise) of size of holdings and its changes in size-distribution of holdings in the talukas of the river basin (1995-96 and 2010-11);

3. To find out the determinates of agricultural land holdings by using Gini-coefficient of Concentration approach and to suggest appropriate strategies to improve the landholding conditions in the environs of the Malaprabha river basin.

Database and Methodology:

The present study is mainly based on the secondary sources of data. Data for the present analysis has been obtained mainly from Directorate, Department of Economic and Statistics, Bangalore, District Statistical Offices of Belgaum, Dharwad, Gadag & Bagalkot districts from 1995 to 2011; besides this, data were also collected from various government offices and websites. Presently the taluka has been considered as the smallest unit of analysis. To achieve the objectives mentioned above the relevant statistical tools like, percentages, averages, variations and others and method of quantitative analysis has been employed. At last results were presented with a suitable diagrams and figures.

Results and Discussions:

i. **Distributional Pattern of Operational Land Holdings by Size in MRB:**

In Malaprabha river basin a definite standard size of farm most suitable to a definite type of farming cannot be maintained because of the increasing burden and dependency of the agricultural population on arable land and the working of the law of succession. These result in the splitting of large size holding into small, often widely scattered pieces of land which fail to conform to any reasonable economic standard from the point of view of agricultural operations. To make discussion convenient, land holdings can be grouped into various classes. The all India Report on Agricultural Census 2010-11 recognized five classes of holdings; marginal (less than one hectare), small (one to two hectares), semi-medium (two to four hectares), medium (four to ten hectares) and large (more than ten hectares and above). Class-wise distribution of operational holdings and their total area in the Malaprabha river basin is furnished in Table-1.

Table-1 Distributional Pattern of Operational Land Holdings by Size in MRB, 2010-11

Sl. No.	Size of Holdings	Number of Holdings	Area (In hectares)	Percentage of Total Number	Area	Size of Holding (In hectares)
1	Below 0.5	50239	15988	10.31	1.41	0.32
2	0.5 - 1.0	80830	63293	16.59	5.57	0.78
Marginal		**131069**	**79281**	**26.90**	**6.98**	**0.60**
3	1.0 - 2.0	164980	240187	33.86	21.15	1.46
Small		**164980**	**240187**	**33.86**	**21.15**	**1.46**
Marginal & Small		**296049**	**319468**	**60.76**	**28.13**	**1.08**
4	2.0 - 3.0	78323	187005	16.07	16.47	2.39

5	3.0 - 4.0	41845	141512	8.59	12.46	3.38
Semi-medium		**120168**	**328517**	**24.66**	**28.93**	**2.73**
6	4.0 - 5.0	23992	105253	4.92	9.27	4.39
7	5.0 - 7.5	27309	162920	5.60	14.35	5.97
8	7.5 - 10.0	10882	91797	2.23	8.08	8.44
Medium		**62183**	**359970**	**12.76**	**31.70**	**5.79**
9	10.0 - 20.0	8217	103915	1.69	9.15	12.65
10	20.0 & above	629	23623	0.13	2.08	37.56
Large		**8846**	**127538**	**1.82**	**11.23**	**14.42**
All Sizes		**487246**	**1135493**	**100**	**100**	**2.33**

Source: Agricultural Censuses Reports of 1995-96 to 2010-11 published by DES Bangalore.

The study reveals that, the important feature of Malaprabha basin's agrarian structure is the continuing predominance of the small level peasantry, both the number and area. There were more than 4.87 lakh farmers of basin area cultivate about 11.35 lakh hectares of land with an average operational land holding of 2.33 hectares as per agricultural census of 2010-11 (Table-1). There are 26.90 percent of marginal farmers in the study area, who cultivated only 6.98 percent of area and the average size of holding in this class is about 0.60 hectares. While 33.86 percent of small farmers hold 21.15 percent of area and the average size of holding is 1.46 hectares, followed by 24.66 percent of semi-medium farmers who cultivated only 28.93 percent of farm area. The average size of holdings is 2.73 hectares. There are 12.76 percent of medium farmers who cultivated 31.70 percent of farm area and the average size of holding in this category is about 5.79 hectares. The large farmers formed only 1.82 percent of total farm holdings and they occupy 11.23 percent of total area in the talukas of the basin area. The average size of holdings in this class is about 14.42 hectares.

The Lorenz curves in Fig.2 confirm the inequalities in the distribution of cultivated area in various size classes in Malaprabha river basin. The average values of Gini's coefficient of concentration ratios turn out to be around 0.449 and 0.446 for the years 1995-96 and 2010-11, an indication of the fact that there was a high concentration of holdings at the lower rung and, of cultivated area at the upper rung of the ladder. It has also been confirmed that even in state or nation there was little change in this pattern. Unfortunately, the consistency in the spatial pattern of distribution established that the process of diversification in rural economy and dis-agriculturalization were very weak in rural side of the study area.

Fig. 2 Lorenz Curve: Inequalities in the Distribution of Area of Holdings in Different Size Classes of Operational Holdings in Malaprabha River Basin, 2010-11

$y = 0.96x - 12.98$
$R^2 = 0.894$
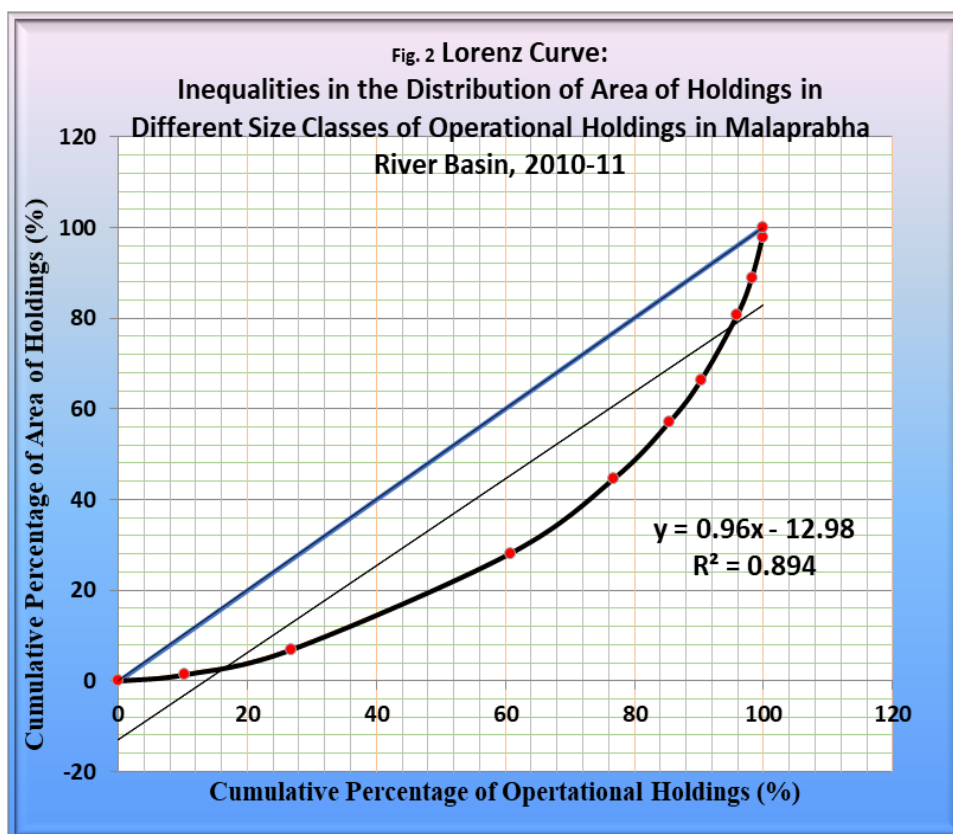
ii.　Spatial Distribution of Size of Holdings:

　　　The impact of the various land reform measures taken overtime should get reflected in the pattern of land distribution and can be roughly measured by looking at the concentration of land in various size classes of holdings. In the following paragraphs an attempt has been made to examine the pattern of land distribution in the basin area as well as to examine its spatial pattern (talukas-wise) also (Table-2). In 2010-11, the share of marginal and small farmers varies from a least of 50.95 percent in Navalgund to a highest of 72.03 percent in Bailhongal taluka with the average of 60.76 percent. The spatial distribution shows that, the **very high** concentration of this category of farmers is more than 70 percent only in Bailhongal (72.03%) taluka and **high** concentration noticed in the ranges from 65 to 70 percent only in Khanapur (68.41%) taluka of the basin. The **medium** zone ranges from 60 to 65 percent in Saundatti (60.18%), Naragund (60.36%), Hubli (61.80%), Dharwad (61.84%), Badami (61.86%) and Kundagol (62.35%) talukas of the basin. While Navalgund (50.95%), Hunagund (54.86%), Gadag (56.86%), Ramadurga (58.37%) and Ron (59.33%) talukas of the basin registered in **low** (less than 60%) zone.

Table-2 Spatial Distribution of Size of Agricultural Land Holdings in Malaprabha River Basin, Karnataka, 2010-11

Sl. No.	Talukas	Components	Marginal Farmers	Small Farmers	Marginal & Small Farmers	Semi-medium Farmers	Medium Farmers	Large Farmers	Total

1	Khanapur	No's (%)	37.03	31.38	68.41	19.71	10.31	1.57	100.00
		Area (%)	10.86	21.58	32.44	25.74	28.58	13.24	100.00
		Average Size	0.62	1.44	0.99	2.74	5.81	17.74	2.10
2	Bailhongal	No's (%)	37.91	34.13	72.03	19.63	7.70	0.64	100.00
		Area (%)	14.05	27.05	41.10	29.83	24.41	4.65	100.00
		Average Size	0.66	1.41	1.02	2.71	5.65	12.96	1.78
3	Saundatti	No's (%)	28.79	31.39	60.18	24.23	13.57	2.02	100.00
		Area (%)	6.99	18.75	25.74	27.15	32.30	14.81	100.00
		Average Size	0.59	1.46	1.05	2.74	5.82	17.89	2.44
4	Ramdurga	No's (%)	27.19	31.19	58.37	25.83	13.81	1.99	100.00
		Area (%)	6.42	19.21	25.62	29.67	33.47	11.24	100.00
		Average Size	0.56	1.46	1.04	2.73	5.75	13.42	2.37
5	Badami	No's (%)	28.39	33.47	61.86	25.09	11.67	1.38	100.00
		Area (%)	7.48	21.93	29.41	30.82	29.90	9.87	100.00
		Average Size	0.58	1.45	1.05	2.72	5.68	15.87	2.22
6	Hunagund	No's (%)	19.50	35.36	54.86	29.21	14.10	1.83	100.00
		Area (%)	4.90	20.97	25.87	31.78	32.49	9.85	100.00
		Average Size	0.63	1.49	1.18	2.73	5.77	13.50	2.51
7	Naragund	No's (%)	25.79	34.58	60.36	24.15	14.17	1.31	100.00
		Area (%)	6.85	21.70	28.55	28.76	35.19	7.50	100.00
		Average Size	0.62	1.45	1.10	2.76	5.75	13.23	2.32
8	Ron	No's (%)	22.93	36.40	59.33	26.41	12.49	1.78	100.00
		Area (%)	5.88	22.94	28.82	30.85	30.43	9.89	100.00
		Average Size	0.60	1.48	1.14	2.75	5.73	13.10	2.35
9	Gadag	No's (%)	20.68	36.18	56.86	27.25	13.58	2.31	100.00
		Area (%)	4.80	21.01	25.82	29.45	31.66	13.07	100.00
		Average Size	0.58	1.45	1.13	2.70	5.82	14.14	2.50
10	Dharwad	No's (%)	28.40	33.44	61.84	24.35	12.10	1.71	100.00
		Area (%)	7.12	21.25	28.38	29.48	31.04	11.10	100.00
		Average Size	0.57	1.44	1.04	2.74	5.80	14.66	2.26
11	Hubli	No's (%)	29.19	32.61	61.80	22.93	13.14	2.13	100.00
		Area (%)	7.15	20.51	27.65	27.04	33.13	12.17	100.00
		Average Size	0.57	1.46	1.04	2.74	5.86	13.29	2.32
12	Navalgund	No's (%)	16.80	34.15	50.95	26.85	19.00	3.19	100.00
		Area (%)	3.81	17.29	21.10	25.50	38.82	14.58	100.00
		Average Size	0.66	1.47	1.21	2.76	5.94	13.29	2.91
13	Kundagol	No's (%)	26.22	36.13	62.35	23.39	12.25	2.02	100.00
		Area (%)	6.94	22.62	29.56	28.05	30.89	11.50	100.00
		Average Size	0.61	1.44	1.09	2.76	5.81	13.12	2.30
	MRB	No's	131069	164980	296049	120168	62183	8846	487246
		%	26.90	33.86	60.76	24.66	12.76	1.82	100.00
		Area (Hact)	79283	240187	319470	328518	359971	127536	1135495
		%	6.98	21.15	28.13	28.93	31.70	11.23	100.00
		Average Size	0.60	1.46	1.08	2.73	5.79	14.42	2.33
No's in %			26.90	33.86	60.76	24.66	12.76	1.82	100
Area (Hact) in %			6.98	21.15	28.13	28.93	31.70	11.23	100
Average Size of Holdings in State			0.48	1.41	0.81	2.68	5.69	14.71	1.55
Average Size of Holdings in India			0.38	1.42	--	2.71	5.76	17.37	1.16

Source: Agricultural Censuses Reports of 1995-96 to 2010-11 published by DES Bangalore.

The share of Semi-medium farmers ranges from as low as of 19.63% in Bailhongal to as high as of 29.21% in Hunagund taluka with the average share is 24.66 percent. The spatial distribution shows that, very high (more than 28%) only in Hunagund (29.21%), high (24 -28%) in Naragund (24.15%), Saundatti (24.23%), Dharwad (24.35%), Badami (25.09%), Ramadurga (25.83%), Ron (26.41%), Navalgund (26.85%) and Gadag (27.25%), medium (20-24%) in Hubli (22.93%) and Kundagol (23.39%) and low (less than 20%) in Khanapur (19.71%) and Bailhongal (19.63%) taluks of the basin.

The concentration of Medium farmers ranges from 7.70 percent in Bailhongal to a highest of 19.00 percent in Navalgund taluka with an average of 12.76 percent. The spatial distribution shows that, the share is very high (more than 16%) only in Navalgund (19.00%), high (12-16%) in Dharwad (12.10%), Kundagol (12.25%), Ron (12.49%), Hubli (13.14%), Saundatti (13.57%), Gadag (13.58%), Ramadurga (13.81%), Hunagund (14.10%) and Naragund (14.17%), medium (8-12%) in Khanapur (10.31%) and Badami (11.67%) and it low (less than 8%) only in Bailhongal (7.70%) taluks of the basin. The Large farmers during 2011 vary from 0.64 percent in Bailhongal to a maximum of 3.19 percent in Navalgund taluka with an average of 1.82 percent. The spatial distribution of this category is very high (more than 3%) only in Navalgund (3.19%), high (2 - 3%) in Saundatti (2.02%), Kundagol (2.02%), Hubli (2.13%) and Gadag (2.31%), medium (1 - 2%) in Naragund (1.31%), Badami (1.38%), Khanapur (1.57%), Dharwad (1.71%), Ron (1.78%), Hunagund (1.83%) and Ramadurga (1.99%) talukas of the basin. The low (less than 1%) share is found in Bailhongal (0.64%) taluka of the basin.

The spatial pattern of average size of land holdings during 1995-96 and 2010-11 in the Malaprabha river basin shows varies from a least of 2.16 hectares in Bailhongal to a highest of 3.91 hectares in Navalgund taluka with the average of 2.94 hectares in 1995-96. To describe of the spatial distribution, it has grouped conveniently into six categories and it shows that, extremely very high zone noticed (more than 3.00) in Hunagund (3.09), Gadag (3.14), Ramadurga (3.15), Saundatti (3.26), Dharwad (3.19), Kundagol (3.20) and Navalgund (3.91)talukas , very high (2.75 to 3.00) in Ron (2.86), Naragund (2.93) and Hubli (2.99) talukas, high (2.50 to 2.75) only in Badami (2.71), low (2.00 to 2.25) in Bailhongal (2.16) and Khanapur (2.17) talukas, while none of the talukas observed in medium (2.25 to 2.50) and very low (less than 2.00) zone of the Malaprabha river basin (Fig-3).

During 2011, depicts that the decrease trend of average size of holdings in all talukas of the river basin and it varies from a least of 1.78 hectares in Bailhongal to a highest of 2.91 hectares in Navalgund taluka with the average of 2.33 hectares. The spatial distribution shows that, none of the talukas noticed in extremely very high zone which consist of more than 3.00 hectares of average size, the very high category is ranges from 2.75 to 3.00 hectares only in Navalgund (2.91) taluka and high noticed in the ranges from 2.50 to 2.75 hectares only in Gadag (2.50) and Hunagund (2.51) talukas of the basin. The medium zone ranges from 2.25 to 2.50 hectares in Dharwad (2.26) Kundagol (2.30), Naragund (2.32), Hubli (2.32), Ron (2.35), Ramadurga (2.37) and Saundatti (2.44) talukas of the basin. While Khanapur (2.10) and Badami (2.22) in low (2.00 to 2.25) and Bailhongal (1.78) taluka of the basin registered in very low (less than 2.00) zone respectively (Fig-3).
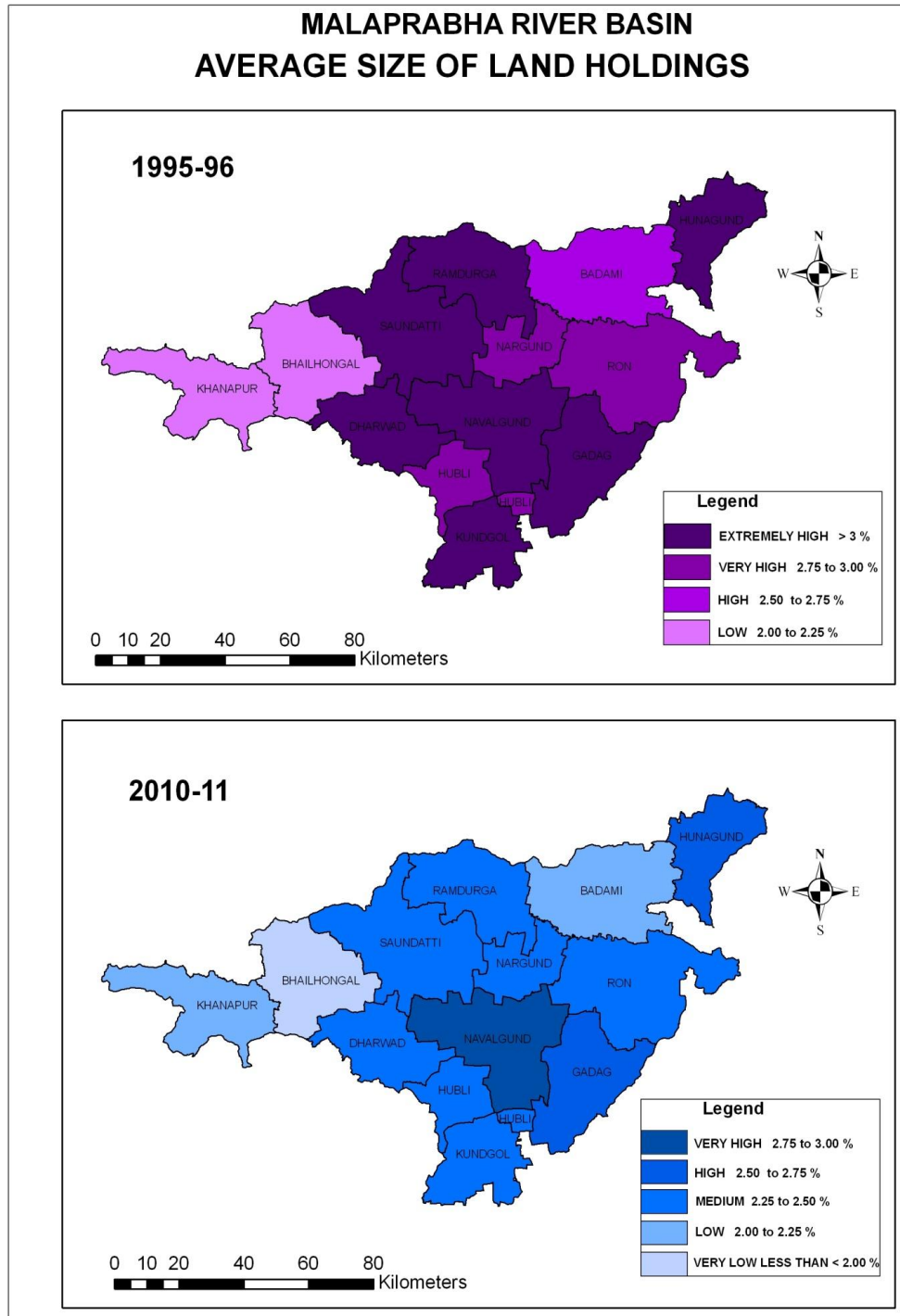
Fig.-3

iii.   Changes in Size-Distribution of Holdings:

To have a factual knowledge of the process of sub-division of holdings information pertaining to them at four censuses has been present in Table-3 to 5 and Fig.4. It is very clear from the tables and figures that number and area of operational holdings falling in marginal, small and semi-medium classes have been increasing at the cost of medium and large holdings. But the average size of respective groups is in decreasing trend in the basin area during the study period. Thus, under optimum holdings are multiplying which still degrades the situation. As per 2010-11 agricultural census the total number of operational holdings in the Malaprabha river basin area is about 4.87 lakhs, compared to 4.56 lakhs in previous census 2005-06, this has registered an increase of 6.84 percent (Table-3 and Fig.4). Among the five major size classes of holdings, the small holdings (one to two hectares) account for a maximum share of 33.86 per cent of the total number of holdings, followed by marginal holdings (less than one hectare) 26.90 per cent, semi-medium holdings (two to four hectares) 24.66 per cent, medium holdings (four to ten hectares) 12.76 per cent and large holdings (more than ten hectares and above) 1.82 per cent, being the least.

Table-3 Trends in Number of Operational Holdings According to Major Size Classes of Agricultural Censuses 1995-96 to 2010-11

Sl. No	Size of Class	1995-96	2000-01	2005-06	2010-11	Changes over 1995-96
1	Marginal	71403	95804	114928	131069	59666
	In %	18.36	22.20	25.20	26.90	60.70
% variation over preceding censuses			**34.17**	**19.96**	**14.04**	**83.56**
2	Small	123987	138105	146726	164980	40993
	In %	31.88	32.01	32.17	33.86	41.70
% variation over preceding censuses			**11.39**	**6.24**	**12.44**	**33.06**
3	Marginal & Small	195390	233909	261654	296049	100659
	In %	50.24	54.21	57.37	60.76	102.40
% variation over preceding censuses			**19.70**	**11.86**	**13.15**	**51.52**
4	Semi Medium	111505	118492	119636	120168	8663
	In %	28.67	27.46	26.23	24.66	8.81
% variation over preceding censuses			**6.27**	**0.97**	**0.44**	**7.77**
5	Medium	68940	68102	64959	62183	- 6757
	In %	17.72	15.78	14.24	12.76	- 6.87
% variation over preceding censuses			**- 1.22**	**- 4.62**	**- 4.27**	**- 9.80**
6	Large	13109	10978	9821	8846	- 4263
	In %	3.37	2.54	2.15	1.82	- 4.34
% variation over preceding censuses			**- 16.26**	**- 10.54**	**- 9.93**	**- 32.52**
	All Classes	**388944**	**431481**	**456070**	**487246**	**98302**
	In %	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
% variation over preceding censuses			**10.94**	**5.70**	**6.84**	**25.27**

Source: Agricultural Censuses Reports of 1995-96 to 2010-11 published by DES Bangalore

The total area operated under all operational holdings in the current census is found to be 11.35 lakh hectares, a marginal decrease by 0.14 per cent as compared to the previous census 2005-

06 figure of 11.37 lakh hectares (Table-4 and Fig.4). As regards, the area operated by different size classes of holdings, medium size class holdings has the highest percentage of area operated i.e., 31.70 per cent, closely followed by semi-medium size class with 28.93 per cent, small size class with 21.15 per cent, large size class with 11.23 per cent and the marginal size class with 6.98 per cent, which has the least share.
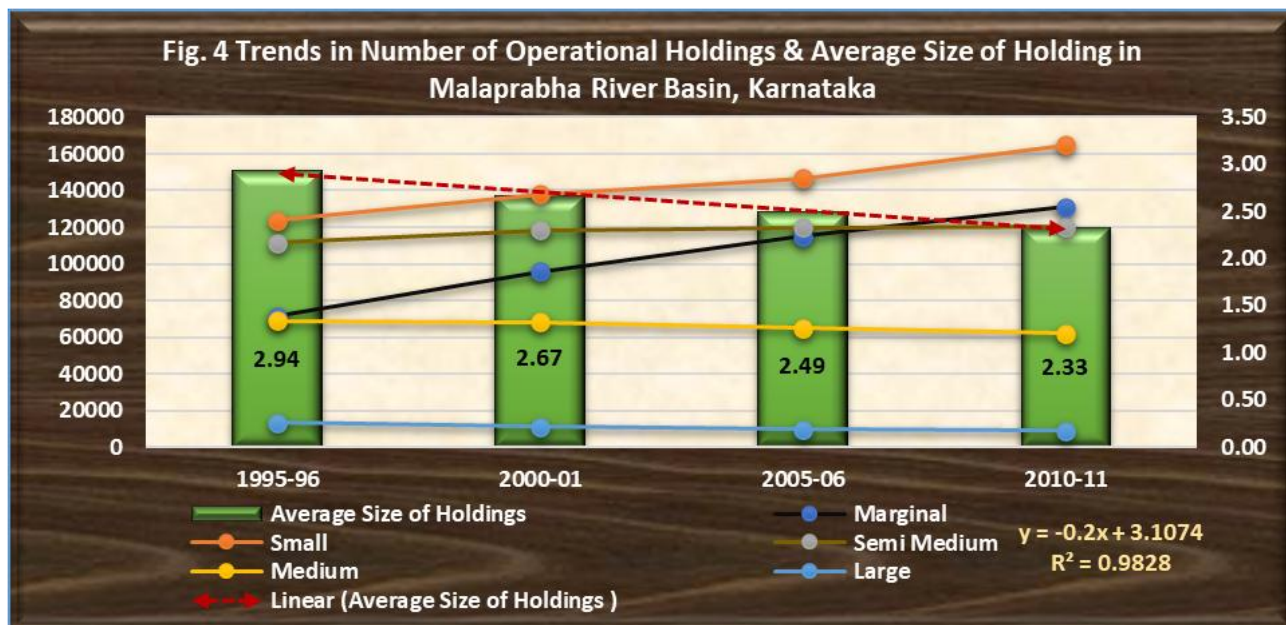

Fig. 4 Trends in Number of Operational Holdings & Average Size of Holding in Malaprabha River Basin, Karnataka

Table-4 Trends in Area of Operational Holdings According to Major Size Classes of Agricultural Censuses 1995-96 to 2010-11 (Area in hectares)

Sl. No	Size of Class	1995-96	2000-01	2005-06	2010-11	Changes over 1995-96
1	Marginal	42228	55766	65680	79281	37053
	In %	3.69	4.85	5.78	6.98	469.32
% variation over preceding censuses			**32.06**	**17.78**	**20.71**	**87.75**
2	Small	185748	204697	216543	240187	54439
	In %	16.25	17.80	19.04	21.15	689.54
% variation over preceding censuses			**10.20**	**5.79**	**10.92**	**29.31**
3	Marginal & Small	227976	260463	282223	319468	91942
	In %	19.94	22.64	24.82	28.13	1158.86
% variation over preceding censuses			**14.25**	**8.35**	**13.20**	**40.13**
4	Semi Medium	311608	328803	331683	328517	16909
	In %	27.25	28.59	29.17	28.93	214.17
% variation over preceding censuses			**5.52**	**0.88**	**- 0.95**	**5.43**
5	Medium	412731	403702	382090	359970	- 52761
	In %	36.10	35.10	33.60	31.70	- 668.28
% variation over preceding censuses			**- 2.19**	**- 5.35**	**- 5.79**	**- 12.78**
6	Large	191073	157255	141106	127538	- 63535
	In %	16.71	13.67	12.41	11.23	- 804.75
% variation over preceding censuses			**- 17.70**	**- 10.27**	**- 9.62**	**- 33.25**
	All Classes	1143388	1150223	1137102	1135493	- 7895
	In %	100.00	100.00	100.00	100.00	100.00
% variation over preceding censuses			**0.60**	**- 1.14**	**- 0.14**	**- 0.69**

Source: Agricultural Censuses Reports of 1995-96 to 2010-11 published by DES Bangalore

The trend in area operated from the Agriculture Census 1995-96, shows slight increase of 0.60 per cent during 2000-01 censuses. Decreasing trend was observed during the subsequent other two censuses and it fell marginally by 1.14 per cent and 0.14 percent during 2005-06 and 2010-11census respectively. Pertaining to the area operated during the census 1995-96 is 11.43 lakh hectares, and decreased to 11.35 lakh hectares during 2010-11 with a decrease of about 0.69 percent.

The average size of operational holdings has come down marginally, from 2.49 hectares in 2005-06 censuses to 2.33 hectares in 2010-11 censuses by 0.16 hectare, which is mainly due to sub-division and fragmentation of land holdings that this trend is common in every Agricultural Census (Table-5 and Fig.4). One notable feature is that the average size of holdings increases with increase in size classes. The marginal size class showed the minimum of 0.60 hectare of average size holdings, followed by small size class holdings 1.46 hectares, semi medium size class 2.73 hectares, medium size class 5.79 hectares and large size class 14.42 hectares, being the maximum.

Table-5 Trends in Average Size of Operational Holdings According to Major Size Classes of Agricultural Censuses 1995-96 to 2010-11 (Area in hectares)

Sl. No	Size of Class	1995-96	2000-01	2005-06	2010-11	Changes over 1995-96
1	Marginal	0.59	0.58	0.57	0.60	- 1.69
2	Small	1.50	1.48	1.48	1.46	-2.67
3	Marginal & Small	1.17	1.11	1.08	1.08	-7.69
4	Semi Medium	2.79	2.77	2.77	2.73	-2.15
5	Medium	5.99	5.93	5.88	5.79	-3.34
6	Large	14.58	14.32	14.37	14.42	-1.09
	Total	**2.94**	**2.67**	**2.49**	**2.33**	-2.07

Source: Agricultural Censuses Reports of 1995-96 to 2010-11 published by DES Bangalore

As per the Agriculture Censuses, during 1995-96 to 2010-11 there was a decline in the average size of operational land holdings in MRB, reflecting the immense population pressure on the limited land resource available for cultivation. The trend of average size of operational land holdings dropped from 2.94 ha in 1995-96 to 2.33 ha in 2010-11 indicating shortfall of 52 percent (Table 5 and Fig.4). Consequently, during the same period, the number of landholdings in the marginal and small categories swelled by about 59666 and 40993, respectively. Landholding size determines investment in agriculture, productivity, farm mechanization and the sustainability of farm incomes itself. Landholdings in the marginal category (less than 1 ha) constitute 26.90 per cent of the operational holdings in the basin (2010-11). In terms of area operated, the share of marginal holdings has increased to 6.98 per cent (2010-11) from 3.69 per cent (1995-96). Similarly, the share of operated area under small farm holdings (1 ha to 2 ha) increased from 16.25 per cent to 21.15 per

cent during the same period. Small and marginal holdings together constitute 60.76 per cent of the number of operational holdings and 28.13 per cent of the operated area in the river basin.

In 1995-96, holding till, say less than two hectares constituted 50.24 percent of the total holdings and shared 19.94 percent of the area operated in the study area, in 2010-11 these percentages increased further to 60.76 and 28.13 percent respectively. Over time the share of marginal, small and semi medium holdings is increasing in all the talukas, while those of medium and large holdings are declining (Table-3 to 5). In 2010-11 large holdings with more ten hectares accounted for about only 1.82 percent and controlled about 11.23 percent of operated area. Thus, farmers with 2 to 10 hectares accounted for about 37.42 percent and operated 60.64 percent of land in 2010-11. The change in operational land holding distribution was facilitated by among other factors, land reforms that emphasized tenancy law of land to the tiller and to an extent land distribution. Agriculture is small-scale and becoming smaller scale over time mainly due to population pressure and inadequate growth of off-farm employment and income opportunities.

Due to sub-division and fragmentation, landholdings are becoming in economical. Besides due to the lack of land consolidation, the holdings are scattered and are often unmanageable and are a limiting factor for crop production. Land lease and tenancy regulations do not allow farming on large scales. The trend in the pattern of distribution of operated area among different size of classes of operational holdings in the study area presents the estimated Gini-coefficient of concentration of operational area. For the basin area as a whole, the degree of inequality in the distribution of operated land has declined from 0.449 percent in 1995-96 to 0.446 percent in 2010-11. It appears that the concentration of operational land has declined in Bailhongal, Khanapur and Hunagund talukas. In Bailhongal and Khanapur talukas, the concentration ratio declined compare to previous censuses. Inequalities got emphasized particularly in Ramdurga, Hubli and Gadag followed by Dharwad and Navalgund taluka. The other talukas of the basin area the ratio remained almost the same with slight variation during the period.

Conclusions:

The present paper has analysed the spatio-temporal analysis of size of operational holdings in the environs of Malaprabha river basin across three periods. The variations in number and area of operational holdings falling in marginal, small and semi-medium classes have been increasing at the cost of medium and large holdings. But the average size of respective groups is in decreasing trend in the basin area during the study period i.e. 1995-95 to 2010-11. Thus, under optimum holdings are multiplying which still degrades the situation. For the basin area as a whole, the Gini-coefficient of

concentration degree of inequality in the distribution of operated land has declined from 0.449 percent in 1995-96 to 0.446 percent in 2010-11. It appears that the concentration of operational land has declined in Bailhongal, Khanapur and Hunagund talukas. Inequalities got emphasized particularly in Ramdurga, Hubli and Gadag followed by Dharwad and Navalgund taluka. The other talukas of the basin area the ratio remained almost the same with slight variation during the period.

The present study has suggested the following possible policy initiatives that could be considered for the better management of land resources of the river basin. The agriculture being one of the most important sectors necessitates appropriate policy vision to redeem the agricultural sector from the stagnation and instability and put it on the stream of sustainable growth on the one hand and to assert the ongoing tendency of the large-scale commercialization of agriculture. The suggestions of the study are implementation of laws relating to land reforms, control on fragmentation of land, integrated land use planning and policy on diversion of land and land tenancy acts in the study area.

References:

- Jasbir Singh & Dillon S. S. (1994): Agricultural Geography, Mc Graw Hill Education India Pvt. Ltd, B-4, Sector-63 NOIDA -201301 India.
- Mohammad Shafi. (2000): Agricultural Geography of South Asia, Macmillan India Limited, New Delhi-110002, India.
- Mandal R.B. (1990): Land Utilization: Theory and Practice, R K Books New Delhi.
- N. Mohammad, Editor, (1992): Dynamics of Agriculture Development, Vol. No 7, Concept Publishing Company, New Delhi.
- T. C. Sharma, (1992): Technological Change in Indian Agriculture A Regional Perspective, Rawat Publications, Jaipur and New Delhi.
- Dr. Prasad (2012): Agriculture and Sustainable Development in India, New Century Publications, New Delhi, India
- Annual Administrative Reports of 1980 and 2011: published by Administrator, CADA Malaprabha & Ghataprabha Projects, Belgaum and Dharwad, Karnataka State.
- Karnataka Agricultural Policy 2006: A Report published by Government of Karnataka, Bangalore.
- Todkari G. U (2012): Impact of Irrigation on Agriculture Development in Solapur District of Maharashtra state, International Journal of Agriculture Sciences Vol. 4, Issue 1, 2012, pp 165-167
- Report of State of Indian Agriculture 2015-16 (2016), Government of India Ministry of Agriculture & Farmers Welfare Department of Agriculture, Cooperation & Farmers Welfare Directorate of Economics and Statistics New Delhi.
- Siddiqui S. H., 1997: Regional Disparities of Agricultural Development in the North Bihar Plain, Geographical Review of India, Vol. 49, No: 3, pp 49 to 53.
- Sanganagouda Patil and V. Sharada (2015): Landholding Structure among Social Groups in Karnataka: An Analysis of Agro-Climatic Zones, Int. Journal of Management and Development Studies 4(4): ISSN (Online): 2320-0685. ISSN (Print): 2321-1423, pp 356 to 365.

==00==