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Vijayachandra Reddy S
Assistant Professor, College of Agriculture, University of Agricultural Sciences, Kalaburagi, Karnataka, India

SM Mundinamani
Professor, University of Agricultural Sciences, Dharwad, Karnataka, India

VA Shinde
Associate Professor, Zonal Agricultural Research Station, Solapur, Maharashtra, India

Correspondence
Vijayachandra Reddy S
Assistant Professor, College of Agriculture, University of Agricultural Sciences, Kalaburagi, Karnataka, India

A study on socio-economic and land holding patterns of organic farming systems in northern Karnataka

Vijayachandra Reddy S, SM Mundinamani and VA Shinde

Abstract
The study aims to analyze the socio-economic features of farmers involved in organic cultivation in addition study also explores to find the land holding patterns in the northern part of Karnataka state. The study has used both primary and secondary data for fulfilling the objectives of the study with sample size of 75 sample respondents from each district, in total consisting of 225 samples. The findings reveals that, the average family size of the sample farmers was 6.15, 6.06 and 5.38 in Bagalkot, Bijapur and Gadag districts respectively. With regard to literacy rate the proportion of illiterates was found to be highest in Bagalkot district (34.66 per cent) when compared to Gadag (26.66) and Bijapur (25.33) district. Further, the study also reveals that the literacy rate in the districts such as Bijapur (72.23%) and Gadag (73.34) were found higher than the Bagalkot district literacy rate (65.34%). However, these three districts literacy rate is on par with Karnataka state literacy rate 66.60%. Therefore, there may not be any problem for the extension workers to educate the farmers regarding recent developments in agriculture and other enterprises to increase their level of income and productivity in farm. The findings on source of irrigation conveys that the major source of irrigation Bagalkot district was through wells (33.77%) followed by bore well (30.06%). Similarly, in Bijapur district the major source of irrigation was through other sources (40.12%) followed by bore well (34.14%), canals (20.74%), wells (4.67%) and tank (0.32%).

Keywords: Organic farming systems, socio-economic, land holding patterns

Introduction
In the recent years, the use of technology has boosted higher agriculture production especially high yielding and disease resistance varieties. These technologies have huge input usage in addition with irrigation, especially fertilizers and pesticides which we call them as synthetic agro-chemicals which were widely used inputs during past Green revolution. However, this increase in production has slowed down and in some cases there are indications of decline in productivity. The impact of Green revolution has unrevealed the importance of high use of pesticides and other chemical use in production process which affects not only human beings but also our agriculture environment and natural resources (Subba Rao, 1999) [7]. The impact on cost associated with Health and Environmental problems due to excessive use of inputs have give space for policy makers and scientists. On the other hand, land fragmentation, decline in natural resource base, high cost for farm inputs recovery and other health hazards have made unfavorable situation of livelihood to many farm families (Ninan and Chandrashekar, 1993) [5]. While incomes in urban areas have risen, farm incomes in real terms have declined in many parts of India during the past decade. Since 1990s, a growing number of farmers have adopted organic agriculture to improve the economic viability of farming and combat negative social and environmental side effects of conventional farming (Parrot and Marsden, 2002) [6]. The Organic farmers' groups and NGOs have formed an 'organic grassroots movement' that supports organic farmers, establishes organic marketing channels and tries to influence policies. However, proper understanding of potential and constraints of organic farming is necessary as a basis for decision making support strategies for farmers and further research.

In organic farming, the local resources are managed well with use of recycling system. The term ORGANIC explains the association of farm with soil health. In fact, the resource availability especially for organic resources is limited in nature. However, due to change in climate conditions, input resources of organic nature have confirmed as most commercial and eco-friendly when compared to agrochemicals (Huang *et al.*, 1993) [3].

Organic agriculture has been defined in various ways. All these definitions, however, primarily focus on ecological principles as the basis for crop production and animal husbandry. In order

to promote organic agriculture and to ensure fair practices in international trade of organic food, the Codex Alimentarius Commission, a joint body of FAO/WHO framed certain guidelines for the production, processing, labelling and marketing of organically produced foods with a view to facilitate trade and prevent misleading claims.

In India, Organic farming dates back as one othe oldest science and alsong with this practice some animals were worshiped such as cow, it was worshipped (and is still done so) as a God. In traditional form, the Indian agriculture exclusively relay on Javik Krishi, which uses extensively the crop residues, animal waste and other on farm and off farm resources which are more beneficial for even soil microbes environments. This kind of micro environments helps the plant growth and overall development.

Organic farming according to Henning *et al.* (1991) [16] is science of farming, consists of values that reflect an attentiveness of social and ecological realities and the ability of the individuals to take effectual actions. To put into practice, organic farming is structured to function with natural resources and also to conserve resources and encourage soil health through diversity, to minimize environmental and other waste impacts by preserving farm productivity. Codex Alimentarius Commission conveys organic agriculture as completed food production system which helps in maintain the good agro-ecological health and also soil biological activities (FAO, 1999) [1].

Today organic farming systems research with a farmer's perspective occupies a pride of place in India's agricultural research agenda. Organic Farming systems concept, after tracing the evolution of general systems theory as a system referring to crop combination or enterprise mix in which the products and/or the by-products at one enterprise serve as inputs for the production of other enterprises (Maji, 1991) [4]. The whole farming rather than the individual crops/enterprises need to be considered in the decision making under the farming systems approach.

Methodology

The present study aimed to analyze the socio-economic characters, land use pattern and sources of irrigation of sample respondents of three districts such as Bagalkot, Bijapur and Gadag in Karnataka. In these northern parts of Karnataka state, state government has implemented The National Project on Organic Farming (NPOF) and National Horticulture Mission (NHM) scheme of Department of Agriculture and Cooperation which are significantly contributed to organic agriculture growth in Karnataka state. In addition, these three district farmers produce is better quality, the stakeholders have registered some internationally acclaimed certification process for export, import and domestic markets. Further, the study used both primary and secondary data to draw meaningful decisions. For data analysis technique of tabular analysis was used by computing averages and percentages to compute the different socio-economic characters such as Age, Education, family size, occupation pattern and others of sample farmers. The percentages and averages were computed to obtain meaningful results.

Results and Discussion

1. Socio-economic characteristics of sample farmers

The information on socio-economic characteristics of the sample respondents is presented in Table 1. The average age of the sample respondents was 43.14 years, 42.13 years and 41.43 years in Bagalkot, Bijapur and Gadag districts, respectively. Literate sample respondents possessing education ranging from primary to college level. In Bagalkot district 28.02 per cent, 18.66 per cent, 13.33 per cent and 5.33 per cent of the respondents had an education level upto primary school, secondary school, high school and college level respectively. In Bijapur district 32.01 per cent, 24 per cent, 16 per cent and 2.66 per cent of the respondents had an education level upto primary school, secondary school, high school and college education level respectively. In Gadag district 24 per cent, 29.33 per cent, 12 per cent and 8 per cent had an education level up to primary school, secondary school, high school and college level education respectively.

The occupational pattern of the sample respondents revealed that, proportion of sample respondents who were involved mainly on agriculture and allied activities constituted 96 per cent, 92 per cent, 97 per cent each in Bagalkot, Bijapur and Gadag districts respectively.

As far as pattern of land holding was concerned, about 73.25 per cent, 75.21 per cent and 78.31 per cent of the cultivable land were under rainfed agriculture and 26.75 per cent, 24.79 per cent and 21.69 per cent of cultivable land were irrigated in Bagalkot, Bijapur and Gadag district respectively.

The socio-economic characteristics of the respondents include literacy, family size, occupational pattern and land holding pattern were depicted in Table 1. With respect the age of the sample farmers it was observed that most of the sample farmers are of the middle age group. Because of their age obviously they were curious about new things and could take innovative decisions to adopt new technologies to enhance their farm income. The average family size of sample farmers in the study are revealed that, the family size was found to be almost similar in all the districts constituting 6.15,6.06 and 5.38 people in Bagalkot, Bijapur and Gadag districts, respectively indicating dominance of nuclear family with one or two children.

With regard to educational level of the sample respondents, it was noticed that majority of the farmers were literate in all the study districts, literacy level of sample respondents ranged from primary to college. Further, the farmer's receptive capacity may ease the process and adoption of technology. Occupational pattern of sample farmers revealed that, the proportion of sample respondents who were involved in agriculture was more than 90 per cent in all districts and individually it accounted to 96 per cent, 92 per cent and 97.33 per cent in Bagalkot, Bijapur and Gadag district respectively.

The study revealed, majority of farm families depend on agriculture and allied activities for their livelihood and employment. The pattern of land holding of sample respondents revealed that, rainfed area accounts about more than 70 per cent in all three districts and proportion of irrigated land was 21.69 per cent, 24.78 per cent and 22.48 per cent in Bagalkot, Bijapur and Gadag district respectively. This implied a typical dry agro-climatic feature of these districts. Due to less potentiality of irrigation projects, still major portion of cultivable area depend on rainfed agriculture.

2. Land holding patter under existing organic farming systems in the study area

The land holding pattern under existing organic farming systems in the study area were worked out and results are presented in Table 2. It is interesting to note that almost all sample farmers cultivating owned land and none of them were taken land on lease basis for cultivation. Rainfed agriculture was predominant in most of the farming systems in the study

area as proportion of rainfed area in total holding was more than 95 per cent. The average operational holding size varied between 1.39 to 1.79 ha in the major farming systems identified in Bijapur district, whereas in Bagalkot it was 1.56 to 1.87 ha and in Gadag it was 1.35 to 1.96 ha.

The land holding pattern under existing organic farming systems in the study area were worked out and results are presented in Table 2. In Bijapur district, majority of the sample farmers were having dryland in FS-III (98.56%) while, FS-II (98.72%) in Bagalkot district and FS-I in Gadag (98.52%). On the contrary irrigated lands were found more in FS-I (4.43%) in Bijapur district followed by FS-III in Bagalkot (3.66%) and Gadag (1.94%). The total owned land was found maximum in FS-II (1.79 ha) followed by FS-I (1.87 ha) in Bagalkot and FS-III (1.96 ha) in Gadag.

3. Sources of Irrigation in Study area

The net irrigated area of Karnataka state was found to be 3237554 ha. The major source of irrigation Karnataka was through Bore well (35.21%) followed by canals (32.78%), other sources (13.10%), wells (12.55%) and tank (6.36%). On other hand, the net irrigated area was found to be highest in Bagalkot (261933 ha) followed by Bijapur (251863 ha) and Gadag (67576 ha). The major source of irrigation Bagalkot district was through wells (33.77%) followed by bore well (30.06%). Similarly, in Bijapur district the major source of irrigation was through other sources (40.12%) followed by bore well (34.14%), canals (20.74%), wells (4.67%) and tank (0.32%). On the other hand, bore well was the major source of irrigation in Gadag district followed by canals (28.10%0, other sources (24.47%), wells (1.31%) and tank (1.22%).

Tables

Table 1: Socio-economic characteristics of the sample respondents (N=225, each district n=75 samples)

S. No.	Particulars	Units	Districts		
			Bagalkot	Bijapur	Gadag
1	Average Age	years	43.14	42.13	41.43
2	Family Size	Nos.			
a.	Adult Male		2.46 (40.01)	2.23 (36.79)	2.41 (44.79)
b.	Adult Female		1.91 (31.05)	1.63 (26.89)	1.76 (32.72)
c.	Children		1.78 (28.94)	2.20 (36.32)	1.21 (22.49)
	Average Family Size		6.15	6.06	5.38
3	Education level	Nos.			
a.	Illiterate		26 (34.66)	19 (25.33)	20 (26.66)
b.	Primary		21 (28.02)	24 (32.01)	18 (24.01)
c.	Secondary		14 (18.66)	18 (24.00)	22 (29.33)
d.	High School		10 (13.33)	12 (16.00)	9 (12.00)
e.	College		4 (5.33)	2 (2.66)	6 (8.00)
	Sub Total		75	75	75
4	Occupational Pattern	Nos.			
a.	Agriculture + Allied Activities		72 (96.00)	69 (92.00)	73 (97.33)
b.	Agriculture + Allied Activities + Business		3 (4.00)	6 (8.00)	2 (2.67)
	Sub Total		75	75	75
5	Land Holding	Ha			
a.	Rain Fed		1.67 (73.25)	1.76 (75.21)	1.48 (78.31)
b.	Irrigated		0.61 (26.75)	0.58 (24.79)	0.41 (21.69)
	Average Land Holding		2.28	2.34	1.89

Note: Figures in parentheses indicate percentage to respective total

Table 2: Land holding pattern under existing organic farming systems in the study area (Area in ha.)

S. No.	Particulars	Bijapur			Bagalkot			Gadag		
I	Cultivated Land	FS-I	FS-II	FS-III	FS-I	FS-II	FS-III	FS-I	FS-II	FS-III
	a. Rainfed	1.51 (95.57)	1.778 (97.69)	1.37 (98.56)	1.81 (96.79)	1.54 (98.72)	1.58 (96.34)	1.33 (98.52)	1.442 (98.10)	1.922 (98.06)
	b. Irrigated	0.03 (4.43)	0.042 (2.31)	0.02 (1.44)	0.06 (3.21)	0.02 (1.28)	0.01 (3.66)	0.02 (1.48)	0.028 (1.9)	0.038 (1.94)
II	Total owned land	1.54 (100)	1.79 (100)	1.39 (100)	1.87 (100)	1.56 (100)	1.59 (100)	1.35 (100)	1.47 (100)	1.96 (100)
III	Leased in land	-	-	-	-	-	-	-	-	-
IV	Total operational holding	1.54	1.79	1.39	1.87	1.56	1.59	1.35	1.47	1.96

Figures in the parentheses indicate percentage of total owned land

*In Bagalkot District	*In Bijapur District	*In Gadag District
FS-I Green gram+Wheat+Ground nut+Dairy	FS-I Green gram+Sorghum+Dairy	FS-I Sorghum + Green gram +Dairy
FS-II Sesamum+ Sorghum+Dairy	FS-II Maize+ Chickpea+Lime+Goat rearing	FS-II Chilli+ Onion+Cotton+Mango
FS-III Maize+Dairy	FS-III Groundnut+Wheat+Dairy	FS-III Maize + Ground nut +Dairy

Table 3: Sources of irrigation in study area

S. No.	Sources of irrigation	Districts			Karnataka State
		Bagalkot	Bijapur	Gadag	
1.	Canals	69978 (26.72)	52242 (20.74)	18987 (28.10)	1061338 (32.78)
2.	Tank	2020 (0.77)	811 (0.32)	823 (1.22)	206047 (6.36)
3.	Wells	88447 (33.77)	11764 (4.67)	887 (1.31)	406243 (12.55)
4.	Bore well	78734 (30.06)	85990 (34.14)	30341 (44.90)	1139885 (35.21)
5.	Others sources	22754 (8.69)	101056 (40.12)	16538 (24.47)	424041 (13.10)
6.	Net irrigated area	261933 (100.00)	251863 (100.00)	67576 (100.00)	3237554 (100.00)

Source: District at a glance (2010-11) of Bagalkot, Bijapur and Gadag districts Karnataka state at a glance (2010-11)

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