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Rudragouda F Channagouda
AICRP on IFS, AHRS, Kathalagere, Channagiri, Davanagere, Karnataka, India

Chandru Patil
AICRP on IFS, AHRS, Kathalagere, Channagiri, Davanagere, Karnataka, India

Gnanesh
AICRP on IFS, AHRS, Kathalagere, Channagiri, Davanagere, Karnataka, India

Corresponding Author:
Rudragouda F Channagouda
AICRP on IFS, AHRS, Kathalagere, Channagiri, Davanagere, Karnataka, India

A comparative study of organic and conventional farmers of Kamadhenu and Horogere villages of Karnataka

Rudragouda F Channagouda, Chandru Patil and Gnanesh

Abstract
The present study was conducted in two villages *viz*. Kamadhenu and Horogera of Kalaghatagi taluk, Dharwad district of Karnataka. In these two villages Govt of Karnataka Organic Village Programme was introduced. The total area under the programme was 125 ha, which includes. 65 organic farm families. The university of agricultural Sciences, Dharwad and BIRD (K), BAIF Surashettikoppa were the implementing agencies. The programme was implemented for 4 years from 2003-04 to 2006-07. A holistic production management system for crops and livestock was introduced. Majority of the sample farmers (70%) are in the age group of 35-45 and 45-55 years followed by above 56 years (23 to 26%) only. Two farmers below 35 years of age are practicing organic farming. The farmers who are practicing organic farming are more literate as compared to conventional farming system. The average size of the family in organic farming is bigger than conventional farming system. The average size of the land holding in organic farms was found to be 1.13 hectare which is almost half of the conventional farms (1.82 ha).

All organic farmers are able to produce their inputs on farm, as 25 farmers involved in vermicomposting, 28 farmers in green manuring, 22 in enriched composting, 18 in Jeevamruth, 6 in Panchgavvya 11 in botanical pesticide preparation. The diversity of cropping system is more pronounced in case of organic farming system as compared to conventional farming system. These organic farmers follow crop rotations, crop residues, animal manures, legumes, green manures, off farm organic wastes, and aspects of biological pest control. Among the crops grown in organic system, Soybean recorded highest net returns (Rs.18875/ha) and B:C ratio (3.56) followed by cotton (Rs. 18500/ha),paddy (Rs.17750/ha), Maize (Rs.17375/ha) and sorghum (Rs.9125/ha) respectively. In conventional system, cotton recorded higher net returns (Rs.34500/ha) and B:C ratio(2.68) followed by paddy (Rs. 29000/ha),Maize (Rs.23750/ha), soybean (Rs.19500/ha) and sorghum (Rs.9255/ha) respectively. It clearly showed that there is higher income in organic system compared to conventional system. These farmers have good opinion about organic farming because there is a reduction in cost of cultivation, improvement in soil fertility, produced healthy food and fodder for human and animal consumption, diversification in farming systems created employment opportunity through out the year and improved the livelihood of the farm families compared to conventional farming. These two villages are going to be a model Organic Villages.

Keywords: Organic farming, conventional farming, socio economic

Introduction
More sustainable agricultural practices are crucial for achieving food security and other basic needs of humanity. Organic farming helps to improve the physical, chemical and biological properties of soil and maintains the ecological balance as well as productivity of life supporting systems for the future generations (Rajagopal and Sreeramulu., 1999) [5]. The success of organic farming strategies would depend on whole farm system involving all aspects of crop production that will maintain soil productivity and reduce dependence on chemical inputs (Pathak and Ram, 2006) [4]. Under the programme efforts are made to bring change in the farming system which aims at maximum production in the cropping pattern and optimal utilization of natural resources. The farm wastes are better recycled for productive purpose in farming systems. Judicious mix of crop production with other agricultural enterprises like horticulture, sericulture, dairy, poultry, fishery, sericulture etc. bring sustainability in agricultural production and improve livelihood of farm families. The loss of biodiversity, decline in crop productivity increase in cost of inputs, environmental degradation and health hazards to human and animals have resulted in decline in the quality of natural resources and livelihood of farm families. Organic farming is a viable alternative to the conventional agriculture.

It enlivens the soil, strengthens the natural resource base, sustains biological processes, provides safe and nutritious food and is environmental friendly. The documented information on organic farming practices can be extended to neighbouring villages or farms. These two organic sites are being visited by several progressive farmers, Agricultural Extension Officers, NGO's, farmers from different places. These two villages are going to be a model organic villages. Hence, to study the impact of organic village programme on crop production and socio-economic condition of the farm house holds was carried out with the following objectives.

1. To study the changes in cropping pattern and farming system of organic farms vis-à-vis conventional farms.
2. To analyse the productivity, profitability and sustainability of organic production systems.
3. To assess the input management practices in organic production system.
4. To assess the socio-economic impact of organic practices among the rural house holds.
5. To ascertain constraints faced by the farmers in conversion of conventional production systems into organic production systems.

Materials and Methods

Two villages mainly Kamadhenu and Horogere of Kalaghatagi taluk of Dharwad district were selected for study. The total area under the programme was 125 ha, which includes. 65 organic farm families. in these two villages Govt of Karnataka Organic village programme was introduced. Kamadhenu and Horogere organic farmers association was formed with 65 farmers as member. The university of agricultural Sciences, Dharwad and BIRD (K), BAIF Surashettikoppa were the implementing agency. The programme was implemented for 4 years from 2003-04 to 2006-07. A holistic organic production management system for crops and livestock was introduced. The organic farmers were educated to follow crop rotations, crop residues, animal manures, legumes, green manures, off-farm organic wastes, and aspects of biological pest management. The crop productivity, bio-diversity, natural resource position, income and livelihood of these two organic village farmers has been studied. By random sampling, a sample size of 30 farmers each organic and conventional were selected from Kamadenu and Harogere villages. The relevant data was collected by using a pre-tested and well-structured interview schedule. The various data are compared on the basis of average of different categories of farmers (Khemchand. *et al*. 2002) [2] and expressed in percentage.

$$\text{Average} = \frac{\text{Sum of the all farmers (30)}}{\text{Total No. of farmers (30)}}$$

$$\text{Per cent age of Farmers} = \frac{\text{No. of particular categories of farmers}}{\text{Total No. Farmers (30)}} \times 100$$

Results and Discussion

Farmer's Opinion

The farmers opinion about organic farming were reduced cost of cultivation, improved the soil properties, increase in soil moisture conservation, less dependent on external inputs like fertilizer, pesticide etc, producing healthy food and fodder, diversification in Farming system, improves the economic condition and also generate employment throughout the year.

Socio economic profile of sample farmers

The Socio-economic profile of both organic and conventional sample farmers selected for study is presented in Table 1. The average age of both category of farmers was found to be around 49 to 50 years. The selected farmers under both category of farming were classified under four age groups namely below 35 years, 35-45, 45-55 and above 56 years. It is interesting to note that majority of the sample farmers (70%) are in the age group of 35-45 and 45-55 years followed by above 56 years (23 to 26%) only. Two farmers below 35 years of age are practicing organic farming.

With regard to education level of sample farmers in case of conventional farming more than 63 percent of the farmers were found to be illiterates 26 percent had primary education and only 10 percent of them have studied up to high school. It was interesting to know that in case of organic farming families more than 50 percent of the farmers are literate of which 40 percent of them studied up to primary school and 16 percent up to secondary school. It is clear that the farmers who are practicing organic farming are more literate as compared to conventional farmers.

The average size of the family of organic and conventional farming was found to be 6.13 and 5.26 respectively. The family size group wise analysis showed that more than 56 percent and 40 percent families of organic farming having between 4 to 6 and more than seven members. Whereas, in conventional farming more than 83 percent of sample farm family sizes were of 4 to 6 persons. It clearly showed that the average size of the family in organic farming is bigger than conventional farming system in the study area.

A comparison of average annual income of the sample farmers revealed that the average organic farm family has annual income were Rs. 29,500 per hectare, but in conventional farm family has Rs. 50,131 per hectare. It clearly showed that farmers practicing organic farming farmers were in the lower income group as compared to conventional farming farmers. This was mainly due to size of land holding of organic farms was smaller (1.13 ha) where as it was 1.82 ha in conventional farms. Hence, the average annual hectare of organic families was Rs.26060, whereas it was Rs.27545 per hectare. This showed initial three years not much difference in annual income of family among farmers, but there were other advantages with organic farm families.

The average size of the land holding (Table-2) in organic farms was found to be 1.13 hectare which is almost half of the conventional farms (1.82 ha) in the study area. More than 80% of the farmers in organic farming are owning less than 2 hectare. This clearly shows that majority of the organic farmers are small and marginal land holders as compared to conventional farmers.

Economics of animal husbandry

The organic farming activities entirely depend on animal husbandry activities (Table-3). The livestock inventory status revealed that organic farmers owning 84 different types of animals compared to 75 in case of conventional farmers. More numbers of cows and buffalos were found in organic farms as compared to conventional farms. It clearly showed that, the net income generated from animal husbandry activities in organic farming system was found to be almost

double (Rs.2028/family) as compared to conventional farms (Rs.1025/family) after meeting their own family requirements. Animal husbandry actively further helped organic farm families in production of organic manures.

Input management practices of sample farmers

It was observed that, production of on-farm inputs by utilizing available resources as one of the important components of organic farming (Table-4). All organic farmers of both villages were involved in production of vermicomposting, 22 in enriched composting, 28 farmers involved in green manuring, 18 in Jeevamruth, 6 in Panchgavvya and 11 in botanical pesticide preparation on their farms. Similarly, Mukeshkumar Pandey *et al.* (2008) [3] also observed that, on farm input production is key for successful organic farming. Whereas, in case of conventional, farming 20 farmers involved in production of FYM and only two farmers in production of vermicompost. These farmers mainly used chemical fertilizers and pesticide for crop production. It can be inferred that, the production of inputs by the organic farmers on their own farm not only reduced the cost of cultivation but also helped for efficient utilization of available farm by- products. The quality of food grain and fodder was good as expressed by organic farmers.

Cropping system/pattern of sample farmers

The comparison of cropping system /pattern followed by sample farmers revealed (Table.5) that the diversity of cropping system is more pronounced in case of organic farming system as compared to conventional farming system in the study area. Pathak and Ram (2006) [4] reported that Jaivik Krishi is a holistic production and management system which promotes and enhance the health of agro-ecosystem, including bio-diversity, biological cycles and soil biological activity. All most all crops such as cereals, pulses, oilseeds, fruits and vegetables were grown in organic farms in a proper sequence, which resulted in building up of soil fertility and enhanced sustainability in production. Haung *et al.* (1993) [1] reported that improved soil physical, chemical, biological properties and better quality of vegetables from organic manures added soils than fertilizer. Whereas, in case of conventional farming monocropping system was predominant both in field crops as well as in horticultural crops.

Economics of major crops grown

The cost of cultivation, net returns and B:C ratio of major crops under organic and conventional farming is presented in Table 6. Among the crops grown in organic system, soybean recorded highest net returns (Rs.18875/ha) and B:C ratio (3.56) followed by cotton (Rs. 18500/ha),paddy (Rs.17750/ha), Maize (Rs.17375/ha) and sorghum (Rs.9125/ha) respectively. In conventional system, cotton recorded higher net returns (Rs.34500/ha) and B:C ratio(2.68) followed by paddy (Rs. 29000/ha),Maize (Rs.23750/ha), soybean (Rs.19500/ha) and sorghum (Rs.9255/ha) respectively. It clearly showed that there is higher income in organic system compared to conventional system. It is also attributed that cost of cultivation was less in organic system compared to conventional system. Srinivasa Reddy *et al*., 2004 [7] who reported that integrated use of 50 percent N each through fertilizer and FYM appears to be more profitable.

Some important constraints faced by organic farmers while conversion to organic farming

1. Farmer have to prepare organic inputs on farm and they feel it is time
2. consuming. Initial years to meet the crop requirement is also difficult.
3. Crop yields reduced in the initial period of transition needs to be supported.
4. Pest and disease management as they switch over to non chemical appears to be difficult. Bio-agents/parasites availability in time and also lack of confidence and experience in using them is also a major constraint. Further the agro –ecosystem stabilization needs time to manage naturally and to create balance.
5. Certification of organic farms is required to get recognition for the products which may adds extra cost to the farmers and also record keeping is essential.
6. The farmers face difficulty in selling their organic produce due to lack of market outlets.

Table 1: Socio-Economic profile of sample farmers n=30

SI. No.	Particulars	Organic		Conventional	
		No. of Farmers	Percent	No. of Farmers	Percent
I. Average Age					
1	< 35	2	6.7	0.0	0.0
2	35-45	11	36.7	11	36.7
3	46-55	10	33.3	11	36.7
4	>56	7	23.3	8	26.7
	Average	50.6		49.06	
	Total	30	100	30	100
II. Education level					
1	Illiterate	13	43.3	19	63.3
2	Primary	12	40.0	8	26.7
3	High school	5	16.7	3	10.0
4	College	0	0.0	0	0.0
	Total	**30**	**100.0**	**30**	**100.0**
	Average	13	43.3	19	63.3
III Average size of the family					
1	< 3	1	3.3	1	3.3
2	4 to 6	17	56.7	25	83.3
3	> 7	12	40.0	4	13.3
	Average	**6.13**	**20.4**	**5.26**	**17.5**
	Total	**30**	**100.0**	**30**	**100.0**
IV. Average annual income (Rs)					
1	<10000	4	13.3	0	0.0
2	10000 to 20000	7	23.3	4	13.3
3	20000 to 40000	15	50.0	8	26.6
4	40000 to 60000	3	10.0	12	40.0
5	> 60000	1	3.33	6	20.0
	Average	29500.0		50131.1	
	Total	30	100.0	30	100.0

Table 2: Land holding pattern of sample farmers

SI. No.	Particulars	Organic		Conventional	
		No. of Farmers	Percent (%)	No. of Farmers	Percent
I. Average size of land (ha)					
1	< 1	5	16.67	0	0.0
2	1 to 2	20	66.67	18	60.0
3	2 to 4	4	13.33	11	36.6
4	> 4	1	3.33	1	3.3
	Average	1.13		1.82	
	Total	30	100.0	30	100.0
II. Type of Land					
SI. No.	**Particulars**	**Organic**		**Conventional**	
		No's	**Area**	**No's**	**Area**
1	Rainfed	17	23.2	23	31.8
2	Irrigation	9	3.8	0	-
3	Both	4	7.0	7	22.8
	Total	30	34.0	30	54.6

				Percent		**Percent**
1	Rainfed	17	23.2	56.67	23	76.67
2	Irrigation	9	3.8	30.00	0	0.00
3	Both	4	7.0	13.33	7	23.33
	Total	30	34.0	100	30	100

Table 3: Economics of animal husbandry activity of sample farmers n=30

SI. No.	Particulars	Organic		Conventional	
		Animals	Average no. of animals per family	Animals	Average no. of animals per family
	Category	Numbers	Numbers	Numbers	Numbers
1	Cow	30	1.00	20	0.70
2	Young stock	2	0.07	5	0.20
3	Buffalo	17	0.57	16	0.53
4	Goat	12	0.40	13	0.40
5	Sheep	08	0.27	3	0.10
6	Bullock pairs	15	0.50	18	0.60
	Total	84		75	
II. Average productivity of animals (per annum)					
	Animals	**Organic**		**Conventional**	
1	Cow	570		550	
2	Buffalo	532		519	
III. Cost and returns (Rs)					
1	Gross Income	7118		6352	
2	Total expenditure	5090		5327	
3	Net returns	2028		1025	
4	Gross Income	7118		6352	

Table 4: Input management practices of sample farmers study area n=30

SI. No.	Particulars of inputs	Organic			Conventional		
		On farm production		Quantity produced (q) /farmer	On farm production		Quantity produced (q) / farmer
		Number of farmers	Percent (%)		Number of farmers	Percent (%)	
1	FYM	3	10.0	18.33	20	66.6	15.05
2	Compost	22	73.3	14.20	0	0	0
3	Vermicompost	30	100.0	15.63	2	6.6	10
4	Green manuring	28	93.3	58.03	0	0	0
5	Jeevamrutha	18	60.0	622	0	0	0
6	Panchgavya	5	16.7	440	0	0	0
7	Azolla production	9	30.0	127	0	0	0
8	Botanical pesticide	11	36.7	372	0	0	0

Table 5: Cropping system/pattern of sample farmers n=30

SI. No.	Cropping system/pattern	Organic		Conventional	
	Crops	No. of farmers	Area %	No. of farmers	Area %
I. Monocropping					
1	Paddy	7.0	23.3	20.0	65.9
2	Soybean	9.0	29.9	15.0	49.5
3	Cotton	3.0	10.0	2.0	6.6
4	Green gram	1.0	3.3	4.0	13.2
5	Black gram	1.0	3.3	0.0	0.0
6	Maize	1.0	3.3	9.0	29.7
7	Chilli	1.0	3.3	0.0	0.0
8	Cowpea	2.0	6.6	0.0	0.0

9	Savi	1.0	3.3	0.0	0.0
10	Sorghum	13.0	43.2	29.0	95.6
11	Groundnut	1.0	3.3	0.0	0.0
12	Wheat	1.0	3.3	5.0	16.5
13	Horse gram	1.0	3.3	0.0	0.0
II. Inter cropping					
1	Mango + Soybean	6.0	19.9	3.0	15.88
2	Mango + Vegetables	2.0	6.6	3.0	15.88
3	Mango + Cowpea	1.0	3.3	5.0	26.47
4	Mango + Savi	2.0	6.6	2.0	10.59
III. Mixed cropping					
1	Soybean + Green gram	1.0	3.32	0.0	0.00
2	Cowpea + Bengal gram	3.0	9.97	2.0	10.59
3	Soybean + Green gram + Niger	1.0	3.32	1.0	5.29
4	Soybean+ Black gram + Green gram	3.0	9.97	0.0	0.00
5	Soybean + Chilli	1.0	3.32	0.0	0.00
6	Soybean + Black gram	0.0	0.00	3.0	15.88
IV. Horticultural crops					
1	Mango	1.0	3.32	2.0	10.59
2	Chiko	2.0	6.65	2.0	10.59
3	Papaya	1.0	3.32	0.0	0.00
4	Guava	1.0	3.32	0.0	0.00
5	Mulberry	2.0	6.65	0.0	0.00

Table 6: Yield and Economics of major crops grown by sample farmers

SI. No.	Crops	Organic (Rs/ha)					Conventional (Rs/ha)				
		Yield (q/ha)	Gross returns	Cost of cultivation	Net returns	B:C ratio	Yield (q/ha)	Gross returns	Cost of cultivation	Net returns	B:C ratio
1	Paddy	37.5	30000	12250	17750	2.45	60	48000	19000	29000	2.53
2	Soybean	17.5	26250	7375	18875	3.56	22.5	33750	14250	19500	2.37
3	Cotton	15	33000	14500	18500	2.28	25	55000	20500	34500	2.68
4	Maize	35	28000	10625	17375	2.64	50	40000	16250	23750	2.46
5	Sorghum	12.5	13750	4625	9125	2.97	15	16500	7245	9255	2.28

Conclusion

The comparative study of organic and conventional farmers of Kamadenu and Horogere villages of Kalaghatagi taluk, Dharwad district of Karnataka. It clearly showed that organic farmers are able to produce the required inputs mainly compost, vermicompost, green leaf manures, liquid manures (Jeevamruth, Pahcagavya) Bio-pesticides, Botanicals and Neem seed kernel extract on the farm and following many indigenous practices of nutrient, pest and disease management in various crops. These farmers have good opinion regarding organic farms because there is a reduction in cost of cultivation, improved soil fertility, produced healthy food and fodder for human and animal consumption. Diversification in farming systems created employment opportunity all round the year and improved the livelihood of the farm families compared to conventional farming. The organic farmers need technology support as many problems creep up in the process of conversion regarding nutrient, pest and disease management in various crops. Further, the farmers expressed lack of proper processing, storage and market facilities their organically grown products as it need specific standards.

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