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Resources, demography and motives driving Organic Farming

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ABSTRACT

Organic farming is emerging as an alternative production system due to increasing demand for organic products in the market, for improving the soil health, environment and well-being of society. Understanding of the multidimensional aspects of organic farming is needed to formulate appropriate policies. Present study was undertaken in Karnataka as it was one of the early states to have a policy that influenced farmers to pursue organic farming. We found that the farmers had either fully organic or mostly organic farms but without certification, only those farmers who were driven by economic motives had organic farming certification. Ecological concern appeared to be the primary motive for majority farmers. The outcome of the study provides key inputs for strengthening extension services particularly certification and marketing of organic produce, capacity building and input availability supported by organic farming policy-making.

Key words: Demographic characteristics, Organic agriculture, Organic farming policy, Resource endowment

Organic agriculture in India has its roots in traditional practices that have evolved over generations. The book on international history of organic farming (Lockeretz 2007) acknowledges the fact that the organic farming idea is deeply rooted in ancient agriculture and to a considerable extent still practised in places such as India (Geier 2007). India ranked ninth in the world with 1.18 million ha area under organic farming and has most number of organic farmers (Willer and Lernoud 2017), but it is still a very small fraction of total agriculture. Organic agriculture offers sustainable income earning opportunities for smallholders (Setboonsarng 2015) and has an important role in the movement towards sustainable agriculture (Kallas *et al.* 2009). The Government of India launched the National Programme on Organic Production (NPOP) in 2000, and the 'India Organic' logo in 2002. The NPOP described Organic agriculture as a system of farm design and management to create an eco-system which can achieve sustainable productivity without the use of artificial external inputs such as chemical fertilizers and pesticides.

There have been studies, most often in the USA and Europe, on the demographic profile of organic producers. People who operate organic farms are typically younger, educated and a significant proportion has entered in agriculture as an entirely new career (Matt *et al.* 2009, Doris 2012, Azam and Banumathi 2015). Education, age and gender positively influenced conversion to organic farming (Azam and Banumathi 2015). In Canada, health concerns and environmental issues were the predominant motives for conversion (Cranfield *et al.* 2010). Siepmann (2016) classified the motives for organic farming in the financial, social and human capital categories. Expansion of organic farming depends strongly on the self-initiative of farmers (Nazeerudin 2016), and hence this study was to understand the demographic and natural resource endowment characteristics and motives driving organic farming.

MATERIALS AND METHODS

The study of farmers practising organic agriculture was carried out in the states of Karnataka, India during 2017 through survey method. The farmers selected for the study were practising organic agriculture under the guidance of Krishi Vigyan Kendras (KVK) also known as Farm Science Centres. Currently, there are 33 KVKs in Karnataka covering all the rural districts. The respondent farmers were the practising organic agriculturists, with or without organic certification, at the time of the survey. A structured interview was scheduled to collect the data from the farmers. Farm size and irrigated area were considered for natural resource endowment. The standard unit of measurement for agricultural land (ha) was used. Four socio-demographic parameters, viz. education, age, experience and number of

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adults in the family were considered. Education levels of farmers were collected as the number of completed years of education and were categorised as per the classification followed in the education reports. Farmers' age was taken as the completed years since their date of birth. Experience was measured in terms of number of completed years since their first year of organic farming. Persons aged 18 years and above staying with the family and involved in farming were considered for number of adults in the family. Farmers' motive behind practicing organic farming was elicited through an open-ended question with option for multiple responses. Motives listed by farmers were then categorized under ecological, economic and social based on the past classifications (Gowda and Jayaramaiah 1998). Responses were received from 173 farmers practising organic agriculture across 19 districts of the state, representing coastal, hill, transitional, and dry agro-climatic zones, covering both rainfed and irrigated agro-ecosystems. Frequency, percentages, independent sample t-test and ANOVA tests were carried out using the SPSS Statistics version 20 to assess the statistical significance.

RESULTS AND DISCUSSION

Extent of organic farming: About half of the respondent farmers were fully organic, while about 20% were mostly organic (>50% of the land under organic cultivation) and the rest were partially-organic (less than 50% area under organic). Fully organic farms were smaller in size (average 3.59 ha), whereas large holders were only partially organic. Fully organic farms had higher percentage of land under irrigation, compared to partially organic farmers, who had less than half of the area covered under irrigation (4.27 ha out of 8.9 ha). Since fully organic farms were smaller in size, their families too had less number of adults than the other two categories. These differences were statistically significant among the three categories. Extent of area converted to organic farming was not influenced by demographic factors like age, education level and organic farming experience of farmers. Converting small farms to fully organic is relatively easier than converting large farms. Small farmers might have had shorter history of agrochemical application, thus putting themselves in an advantageous position to convert into organic agriculture (Setboonsarng 2015). Converting large farms to organic agriculture also requires enormous support from the supply side. The requisite input, when not sourced within the farm, may not be easily accessible for large farms in required quantity. Large farms with larger area under irrigation may also induce farmers to do high external input intensive agriculture, thereby limiting the extent of conversion to organic agriculture. Since the natural resources have played decisive role on the extent of conversion, the demographic factors like age, education and experience might have limited role in the extent of organic area.

Certified and non-certified organic farmers: About 27% of the respondents had their farms certified as organic while the majority did not possess certification. Independent samples t-test (Levene's Test for Equality of Variances indicated by F values) between the two groups revealed that landholding size, percentage of area under organic farming and number of irrigation sources differed significantly between certified and noncertified organic farmers (Table 1). Certified organic farmers had larger holdings compared to non-certified organic farmers. Similarly, certified organic farmers had higher percentage of their land holding under organic farming with more sources of irrigation. The certified organic farmers' higher area under irrigation and organic farming were statistically non-significant. The socio-demographic characteristics like age, education and experience in organic farming did not differ between the two groups.

Certification of organic agriculture is important in international trade, but non-certified organic agriculture, on the other hand, is typically practiced by small traditional farmers who follow agro-ecological principles (Setboonsarng 2015). Most successful countries in organic agriculture are providing subsidies or maintenance fund and in some both are being provided (Gurung *et al.* 2013). The growth of Organic agriculture and the farmers can be grouped under three categories. First category farmers are in no-input or low-input use zones and they are doing it as a tradition. Second category has recently adopted the organic in the wake of ill effects of conventional agriculture. The third category has systematically adopted the commercial organic agriculture to capture emerging market opportunities and premium prices. While majority in the first category was not certified, those in the second were both certified and non-certified but majority of the third category was certified.

Table 1 Demographic and resource endowment profile of certified and non-certified organic farmers

Factor	Certified (n=47)	Non-certified (n=126)	F value	Sig.
Age (yr)	49.59	48.60	0.05	0.83
Education (yr)	11.89	11.61	1.91	0.17
Adults in family (No.)	4.02	3.97	1.19	0.28
Organic farming experience (yr)	10.91	9.29	0.91	0.34
Land holding (ha)	6.93	4.95	4.26*	0.04
Irrigated area (ha)	4.15	2.67	1.95	0.16
Irrigated area (%)	68.40	54.77	3.01	0.08
Organic farming area (ha)	4.26	2.87	1.94	0.17
Organic farming area (%)	79.38	71.61	7.78**	0.00
Irrigation Sources (No.)	2.89	2.63	14.19**	0.00

*significance at 0.05 level, **significance at 0.01 level

Landholding status of organic farmers: Categorisation of farmers based on land holding size revealed that all categories of landholders were practising organic farming. But the proportion of organic farmers increased with the increase in landholding size. Among the four groups, large farmers with holding size of more than 10 acres were more compared to other three groups. Marginal farmers (holding size of less than 1 ha) accounted for 17.9% followed by small farmers (20.8%) and 22.7% medium farmers (2–4 ha). These four groups differed significantly with respect to most of the demographic characteristics and natural resource endowment. Marginal landholders practicing organic agriculture were young compared to organic farmers with large holding size. While the marginal organic farmers had education up to secondary school level, the large organic farmers had more than 12 years of education. Marginal farmers had fewer working adults in their family and had started organic farming less than six years ago whereas the large holder farmers had more experience. The average landholding of marginal organic farmers was 0.81 ha compared to 1.57 ha among small farmers, 3.14 ha among medium farmers and about 11.36 ha among large holder farmers. These differences were statistically significant. The four groups of farmers also differed significantly in terms of area under irrigation and area under organic farming. Small and marginal farmers had converted most of their land into organic farming as compared to 62.4% among large holder farmers.

Landholding of the organic farmers did not match with the general picture of Indian landholding status. Within each category, organic farmers possessed larger holdings compared to the national average. Medium to large farmers, about 5% of the total farmers of the country, were in majority. The national average holding size for marginal farmers was just about 0.4 ha (Agriculture Census of India 2010–11), whereas the sampled organic farmers had about 0.81 ha. The national average for small farmers was 1.41 ha, whereas the average for small organic farmers was 1.57 ha. Past studies (Flaten *et al.* 2006, Doris 2012) have indicated that there has been a recent shift to larger and more commercially oriented farms converting to organic methods. Presence of a greater number of adults in the large holder families might be an encouraging factor to practice organic agriculture contributing to family farming. The fact that organic farming is generally more labour-intensive than conventional agriculture could mean that organic agriculture aids in addressing disguised unemployment (Setboonsarng 2015). As organic agriculture allows for safe working activities with least or no exposure to pesticides, it enables women to work with least occupational hazards.

Irrigation sources for organic farmers: About 13.3% of the organic farmers had no source of irrigation and were practicing rainfed farming. Majority of the organic farmers were dependent on groundwater as source of irrigation. Very few farmers had more than one source of irrigation, both surface and ground water resources. None of the organic farmers was practicing organic agriculture under command area of irrigation. With respect to irrigation sources, farmers with a greater number of irrigation sources had higher experience in organic farming compared to farmers who were dependent on open well/farm pond as source of irrigation. The rainfed and groundwater dependent organic farmers had equal length of experience in organic farming with just above nine years. Types of irrigation and number of irrigation sources did not differ significantly with respect to landholding size. Organic agriculture can benefit rainfed farms by decreasing the irrigation needs, which is vital for adaptation to drought conditions. It becomes important to promote such farming systems on a wider scale.

Education level of organic farmers: Majority of the organic farmers had education up to secondary school level followed by college level education and graduates (Table 2). Higher level of education had induced farmers towards organic farming earlier, whereas farmers with lower educational level took longer time to organic farming. Post graduates ventured into organic farming much earlier as reflected by their longer experience in organic farming. Average landholding of different education categories differed significantly. Graduates, professional graduates and postgraduates had larger holdings and had converted larger area of their holdings into organic farming compared to the secondary level educated farmers. Professional graduates had the highest proportion of area under organic farming (90%) compared to all other groups. Area under irrigation

Table 2 Educational level and the resource endowment of organic farmers

Education	organic farming exp (yr)	Land holding (ha)	Organic farming area (ha)	Organic farming area (%)	Irrigated area (ha)	Irrigated area (%)
Primary (n=8)	7.88	1.70	1.26	74.06	0.72	42.17
Upper primary (n=13)	9.15	6.57	5.35	81.56	4.25	64.85
Secondary (n=65)	7.95	3.69	2.62	71.05	2.26	61.19
Senior Secondary (n=34)	9.97	6.87	4.71	68.56	4.10	59.87
Graduates (n=28)	10.79	8.30	5.05	60.90	5.68	68.50
Professional (n=11)	12.36	5.79	5.20	90.00	3.93	67.90
Post-graduates	14.86	5.74	4.55	83.15	3.90	69.64
F value	3.08**	2.64**	3.74**	2.04*	1.42	0.76

*Significance at 0.05 level, **significance at 0.01 level

and proportion of irrigated area out of the total land holding did not differ among farmers possessing different education levels.

Higher levels of education and its influence on organic farming are of critical significance to design policies promoting organic agriculture. According to educational statistics of Government of India, literacy rates have gone up from 18.3–73% in the last six decades (1951–2011) in India. Enrolment in higher education has also increased, possibly due to increase in number of colleges from 578–38498 and universities from 27–760 during this period. These have positive impact on organic farming as higher education has motivated farmers to opt for organic farming much earlier than the less-educated farmers. Flaten *et al.* (2006) also confirm that new entrants to organic farming were less educated than the early entrants. While education could be a causative and intervening factor influencing farmers to practice organic farming, better family education could also be a consequence of organic farming. Farm families practicing organic agriculture provided better education to their school-age children by spending on education (Setboonsarng 2015).

Ensuring access to quality education for all, particularly for the poor and rural population is central to the economic and social development of India (Gille 2010). A better educated farmer is more likely to use new technology, and to have market access and off-farm activities (Onphanhdala 2009). Majority of graduate and professionally qualified farmers shared the mobile advisories with fellow farmers and helped harness the potential of new methods of communication (Gowda and Dixit 2015). Therefore, presence of well-educated farmers, particularly the organic farmers, could be effectively harnessed by the public extension system for effective implementation of government initiatives like Paramparagat Krishi Vikas Yojana under the National Mission on Sustainable Agriculture of Government of India.

Motives for organic farming: Ten different motives seemed to be guiding farmers in pursuing organic farming which have been categorised under ecological, social and economic considerations (Table 3). Ecological considerations were the dominant motives for majority organic farmers studied. Nearly three-fourth of farmers expressed at least one environment related motive as the driving factor. Ecological motives included maintaining soil health, chemical-free food production, eco-friendly farming and sustainable farming. Among the social motives; health of family members and health of consumers were the motivating factors. Economic motives were not as overwhelming as the other two categories of motives although reduction in cost of cultivation and realizing better price in the market did motivate farmers. Farmers who had economic motives opted for certification to realize better price for their produce. Farmers who had concern for family health got their soils tested like those who had concern for soil health and also had organic certification. Farmers who had dominant economic motives had organic certification while those who were driven by ecological and social motives did not give importance to certification but had got soil testing done.

Table 3 Motives for organic farming and the extent of certification and soil testing

Motive	Farmers (N=173)	Certified farmers (%)	Soil tested farmers (%)
Ecological motive (n=130)			
Maintain soil health	85	23.5	65.9
Chemical free food production	46	23.9	58.7
Eco-friendly farming	34	50.0	38.2
Sustainable farming	24	12.5	33.3
Social motive (n=98)			
Good for own/family health	63	23.8	71.4
Quality produce to consumers	44	40.9	61.4
Continue the tradition	5	20.0	100.0
Economic motive (n=86)			
Reduce cost of cultivation	57	08.8	36.8
Better price in the market	28	64.3	60.7
Utilize Government scheme	7	42.9	85.7

Organic farmers were found to be mostly concerned with soil health, own and family health and reducing cost of cultivation than earning high profits and availing government assistance. The results are in line with the objectives of Organic Farming Policy of Government of Karnataka- "Prepare farmers for sustainable farming, improve soil fertility, reduce environmental pollution and enable farmers to face the drought situations", Panneerselvam *et al.* (2014) and Cranfield *et al.* (2010) reported similar motives among Indian and Canadian farmers, respectively. Koesling *et al.* (2005) suggested agricultural policy instruments, additional organic farming payments and organic farming laws and regulations as important factors for farmers' decision regarding the conversion to organic farming.

The large farms were partially organic compared to small farms. Organic farmers were using groundwater for irrigation, whereas areas having canal water were not practicing organic farming. Encouraging and facilitating organic farming in command areas with incentives for use of water by water saving devices can help in promoting organic farming. Certification of organic produce is an issue and nearly three fourths of organic farmers were not certified. Farmer-friendly certification process is needed to help organic farmers to tap the international market. The predominant motive of organic farmers seems to be springing out of ecological concerns, but better prices for organic produce must drive farmers towards organic farming eventually as many educated farmers have ventured into

organic farming. The markets must evolve a mechanism to reward organic growers. Organic farming is fast catching up with the educated neo-agriculturists which can spur new growth in the farming sector.

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