

Comparative economic indicators of the farmers practising natural farming vs conventional farming system

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Summary

The present study was carried out in Kanchipuram district of the Tamil Nadu. Paddy is the main cereal crop raised in 47,739 ha of the cultivated area followed by groundnut and pulses. Farmers following conventional and natural farming are purposively selected in 120 numbers to cultivate Paddy in 436.56 ha among that area and data was gathered from their respective fields. The main aim of this study is to analyze whether natural farming system was economically better with sufficient economic returns to the farmers against conventional farming practices. The study was confined only to major crop of the study area; paddy. The comparative analysis results revealed that natural farming is a viable option for farmers under the prevailing conditions with a significant yield gap and higher benefit-cost ratio against conventional farming in 2021–2022. Efficient use of available natural resources as a key input for farming was found economically attractive enough to trigger wide spread adoption of natural farming systems in the study area.

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Keywords: Conventional farming, natural farming, income, benefit-cost ratio

Introduction

Organic agriculture is considered as a safer alternative. Recently, the world has turned to organic agriculture only in a healthy and clean environment, to live healthy and happily by consuming or using food and non-food products that are healthy and clean without residue. In addition, organic agriculture may contribute to a country's socio-economic development and ecological sustainability (Husnain et al. 2017). Organic farming promotes an agricultural practice that emphasizes natural soil fertility and eliminates or minimizes damaging chemical components or products to the most minimal level (Clark 2009; Stagnari et al. 2013; Bana et al. 2022; Sarangthem et al. 2023). Organic agriculture has been observed to have three main dimensions, which are economic, social and environmental dimensions towards encouraging and promoting food security (Grogan 2012; Haldhae et al. 2017).

Kanchipuram district is agriculture-dominated, with the majority of the population depending on their livelihood and primary source of family income. Agro-climatic condition of the district influences farming which is mainly confined to the traditional cultivation practices depending on the monsoon. Paddy is the main cereal crop raised in 47,739 ha of the cultivated area followed by groundnut and pulses. But Paddy is the most common crop being cultivated by the farmers in the study area. Due to indiscriminate use of fertilizer, pesticides and poor water management, farmers face

loss in soil fertility, health, poor yield and increased cost of production, resulting in a decreased profit margin for the growers. To overcome this situation, innovative methods like natural farming were being practiced by some farmers in the Kanchipuram district under the guidance of the Climate Smart Agriculture Project taken by BMZ–SIARD and Don Bosco College of Agriculture, Sagayathottam.

Materials and Methods

The case study is on paddy farms in Kanchipuram districts of Tamil nadu. Farmers typically grow paddy, the main crop annually within two seasons named Rabi and kharif. The major crops grown in the area is paddy, which is cultivated by 63% of the farmer during the Rabi season, comprising an area of approximately, which take over 40% of the total cultivated land in the area. A total of 120 farmers were purposively adopted for this study through a purposive sampling technique. The farmers were understood to practice both conventional and organic farming systems to those areas. Accordingly, 120 Paddy growers were selected as respondents for this study. Ex-post facto research design was followed for this study. The data was collected from the respondents with the help of a well-structured interview schedule.

Results and Discussion

It could be seen from the Table 1 that nearly half of the organic growers (46.66%) belonged to young age category followed by 36.67 per cent and 16.67 per cent belonged to old age and middle age categories, respectively. In the case of conventional growers, majority of the conventional paddy growers (41.66%) belonged to old age category followed by 31.67 per cent and 26.67 per cent belonged to middle age and young age categories, respectively.

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Table 1. Distribution of respondents according to their age

S. No.	Category	Organic (n=60)		Conventional (n=60)	
		Number	Per cent	Number	Per cent
1.	Young (Up to 35 years)	28	46.66	16	26.67
2.	Middle (36 – 45 years)	10	16.67	19	31.67
3.	Old (Above 45 years)	22	36.67	25	41.66
Total		60	100	60	100

It could be seen from the Table 2 that majority of the organic paddy growers (61.67%) belonged to illiterate category and remaining 38.33 per cent belonged to literate category.

In the case of conventional growers, majority of the conventional paddy growers (70.00%) belonged to illiterate category and remaining 30.00 per cent belonged to literate category.

Table 2. Distribution of respondents according to their educational status

S. No.	Category	Organic (n=60)		Conventional (n=60)	
		Number	Per cent	Number	Per cent
1.	Literate	23	38.33	18	30.00
2.	Illiterate	37	61.67	42	70.00
Total		60	100	60	100

Input use pattern in natural vs conventional paddy

Regarding input use pattern in natural vs conventional farming, it was found that most of the farmers taken white ponni for organic cultivation, used less seed rate (15 kg / acre), applied FYM / Vermicompost and treated

seed with biofertilizers in organic fields. Weeding (Cono and manual) and a number of irrigations were the same in both systems. There was no use of chemical fertilizers in organic fields.

Table 3. Input use pattern in natural vs conventional

S. No	Particulars	Organic	Conventional
1	Varieties	White ponni	White ponni
2	Seed treatment	Bio fertilizers (Azospirillum/phosphobacteria)	Captan/Thiram
3	Seed rate kg/acre	15 kgs	45 kgs
4	FYM tons / acre	5 Tonnes	-
5	Fertilizers – NPK / acre	-	(60: 20: 20 kg of NPK)
6	Micro nutrients	Enriched Vermicompost Jeevamirtham	Micro foods (Borox, ZnSO ₄ , CuSO ₄ .)
7	Growth regulators	Fish meal acid, oil cakes solution	Stimulants (Paushak and NAA)
8	Weed management	Cono weeder/ hand weeding	Herbicide
9	No. of irrigation	8-10 (Alternate wetting and drying)	8-10
10	Pest management	Pathilai karaisal 3 G Karaisal Agniastram Asafoetida solution	Lambdax cyhalothirin Acephate Cartap hydrochloride
11	Disease management	Panchakavyam Karpura karaisal	Tricyclozole Mancozeb+ Carbendazim

Table 4. Returns from paddy crop in natural vs conventional

S. No	Particulars	Natural	Conventional
1	Cost of seed	1200	2250
2	Seed treatment	120	300
3	Manures FYM	3000	-
4	Fertilizers	-	3800
5	Bio fertilizers	280	-
6	Micro nutrients	300	1000
7	Growth regulators	300	1200
8	Plant protection	600	3500
9	Weed control	1750	2200
10	Machinery charge	4500	4500
11	Irrigation charge	800	800
12	Labour charge	3200	3200

13	Harvesting	1800	1800
	Total	17,850	24,550

Table 5. Yield and Economics of paddy under natural farming and Conventional farming in the study area

S. No.	Income	Natural	Conventional
1	Grain yield (q/ acre)	24.00	20.80
2	Straw yield (Bale/ acre)	42	39
3	Cost of cultivation (Rs./acre)	17,850	24,550
4	Gross Income(Rs./acre)	40,500	35,100
5	Net Income(Rs./acre)	22,650	10,550
6	Benefit Cost ratio	2.26	1.42

The results in the table 5 depicts that natural farming practice has an increased average grain yield of 24.00 quintals with straw yield of 42 bales (16.80 quintals) against an average yield of 20.80 quintals with 39 bales 15.60 quintals of the conventional farming system respectively. An increase in yield indicates the advantage of efficient nutrient management over the existing conventional practice toward enhancing the gross farm income on seed treatment with the use of Panchakavyam and Jeevamrutham as plant nutrients. The incidence of pests (yellow stem borer, leaf folder) and disease (Blast and blight) in paddy is significantly less in the study area; however, application of Pathilai karaisal, 3G Karaisal, Agniasthiram and Asafoetida solution for pest control and Panchakavyam and Karpura karaisal for disease management found helpful.

The economic results revealed that natural farming with an average investment on cultivation of Rs. 17,850/- per acre was found compared to an average investment of Rs.24,550/- under conventional practices during Kharif 2021. Under natural farming, the net income generated with mean value of Rs.22,650/- per acre and benefit-cost ratio of 2.26 was found against mean value of Rs. 10,550/- with benefit-cost ration of 1.42 under Conventional farming. However, majority of farmers, after meeting their home consumption need they offer to sell their leftover produce to nearby farmer producer companies at regular prevailing price and very few farmers with high marketable surplus offer their produce to a premium price.

Conclusion

Organic farming is becoming popular among the farming community. It is an environmentally friendly, low-cost alternative method of agricultural production compared to present-day chemical-induced agriculture. The study conducted in the farmer's field revealed that natural farming practices adopted in Paddy were better than conventional method of cultivation in yield parameters. Economic viability has potential for upscaling of production. However, the availability of

Neem leaves, and trespassing by wild animals (peacock, monkey, wild pig) may face constraints at the farmer's level. Reduced cost of cultivation will substantially increase the income as well as the livelihood of the farming community. The favourable benefit-cost ratio is self-explanatory of the economic viability of the natural farming system against the conventional type. Natural Farming is one of the alternative farming practices for improving the farmers' income, in the backdrop of declining fertilizer response and farm income.

Declaration of interests

The authors have no conflict of interest to declare.

Data Sharing

All relevant data are within the manuscript.

References

1. Bana RS, Dawar Rakesh, Haldhar SM, Godara S, Singh A, Bamboriya SD, Kumar V, Ishra AK & Choudhary M. 2022. Natural farming: Is it safe to march ahead? *Journal of Agriculture and Ecology*, 14: 01-11.
2. Clark SF. 2009. The profitability of transitioning to organic grain crops in Indiana. *Am. J. Agric. Econ.*, 91: 1497-504.
3. Grogan KA. 2012. Comparison of organic and conventional pest management practices among California citrus growers. *J. Sust. Agric.*, 36: 478- 97.
4. Haldhar SM, Jat GC, Deshwal H, Gora JS & Singh D. 2017. Insect pest and disease management in organic farming. Book 'Towards Organic Agriculture' edited by B. Gangwar and N. K. Jat. Today & Tomorrow's Publishers, New Delhi, Page: 359-390, ISBN: 81-7019.
5. Husnain M, Khan M & Mahmood H. 2017. An assessment of public and private benefits of organic farming in Pakistan. *J. Anim. Plant Sci.*, 27(3): 996-1004.
6. Sarangthem I, Haldhar SM, Mishra LK & Thakuria D. 2023. The book of abstract: international conference on natural farming for revitalizing environment and resilient agriculture (NF-RERA, 2023). Pub: College of Agriculture, CAU, Imphal, pp: 374, ISBN: 978-81-947184-4-4.
7. Stagnari F, Onofri A, Codianni P & Pisante M. 2013. Durum wheat varieties in N-deficient environments and organic farming: a comparison of yield, quality and stability performances. *Plant Breeding*, 132: 266-275.