P-ISSN: 2618-0723
E-ISSN: 2618-0731

NAAS Rating: 5.04
www.extensionjournal.com

International Journal of Agriculture Extension and Social Development

Volume 7; Issue 9; September 2024; Page No. 401-404

Received: 22-06-2024
Accepted: 27-07-2024

Indexed Journal
Peer Reviewed Journal

Understanding the farm economics of farmers under different stages of transition from conventional farming toward agroecological farming in Madhya Pradesh

Mamta Kumari, Naresh Prajapat, Ashish Ambasta and SKS Bhadauria

Self-Reliant Initiatives through Joint Action (SRIJAN) Regional Office, Jhansi, Uttar Pradesh, India

DOI: https://doi.org/10.33545/26180723.2024.v7.i9f.1077

Corresponding Author: SKS Bhadauria

Abstract

A comprehensive baseline survey of 1776 farmers were conducted as part a program to scale up natural farming practices to over 50000 farmers across 11 Agroecological zones in Madhya Pradesh to understand various parameters of interest like quantum of inputs, cost of cultivation, fertiliser subsidy, yield, income and impact of organic inputs on normalised yield among farmers in different stages of transition from chemical farming to agroecology-based farming. The key findings from the study are the limited usage of organic inputs especially in organic farms, the subsidy offered to chemical farms through fertilisers subsidy, and the impact of organic inputs on normalised yield. The study indicates that though standardisation is not the approach adopted in natural farming, there is a need for standards with respect to basic composition of input, quantum of inputs, etc. It is essential to identify the front runners among farmers, document and analyse their practices to derive and offer standards for others. In order to make strides towards scaling up of Agroecological farming, there is a need for more research and data on natural farming practices and outputs.

Keywords: Natural farming, agroecological zones, baseline survey, organic inputs, chemical farming, input quantum

Introduction

Agroecology as an approach to foster the transition to food systems that conserve resources and improve human well-being has been increasingly promoted by scientists, Non-Governmental Organisation (NGOs), international organisations, and peasant movements. Agroecology advocates for small-scale, autonomous, resilient and efficient farming systems, that also value human rights (including women, youth and indigenous people), local cultures, social participation and food traditions. At the farm level, agroecology favours practices based on multi-functionality and biodiversity to reduce the dependence on external agrochemical inputs and to enhance ecological processes. Agroecological practices are knowledge intensive and tailored to local ecological conditions and cultural knowledge. Agroecological practices can be technically oriented, such as composting or biocontrol and/or more socially oriented and promote, for instance, gender equality or local culture. Policies can advance agroecology by supporting agroecological research and the development of agroecological practices, and by ensuring that farmers have access to and security over land, and access to markets that valorise agroecological farmers and their produce. The agroecological transition is defined as the gradual change that farmers undergo to adapt and move from more conventional towards agroecological farming principles, encompassing technological, societal, institutional and organisational changes in the food system.

A consortium of 16 civil society organizations came together under the Madhya Pradesh Chapter of National Coalition for Natural Farming (NCNF-MP) in the year 2021 and collectively designed a program titled “Aligning Farming with Nature across Agro-ecologies in MP”. The key focus of this project was to scale up farming practices that would regenerate and leverage the power of natural systems. Over 50000 farmers in transition from conventional farming to Agro-ecological farming are supported under the project and are spread across more 1000 villages in 43 blocks of 22 districts across 11 Agro-ecological zones. A range of activities including seed treatment, conservation agriculture, system of crop intensification, crop diversification, revival of endangered Agro-bio-diversity, establish Bio-input Resource Centres (BRCs), Community Seed Banks, Kitchen Gardens, etc. are conducted.

The key feature of the project is the component of documentation, monitoring and research with the objective of building evidence and a proof of concept that could push policies on natural farming in the right direction. As part of this component, a comprehensive baseline survey was conducted across all the Agro-ecological zone covering 1776 farmers. This gave us the opportunity to study farms in various stages of transition including conventional farms, non-pesticide management farms, organic and natural farms. The objective of this study is to capture a holistic set of indicators across economic, social and ecological dimensions across the farms under transition.

Methodology

A comprehensive baseline survey of 1776 farmers were conducted as part a program to scale up natural farming practices to over 50000 farmers across 11 Agro-ecological zones in Madhya Pradesh. This gave us the opportunity to study farms in various stages of transition including conventional farms, non-pesticide management farms, organic and natural farms. While the cost of cultivation, yield and income reflects the pasts studies and experience, the study offers fresh insights with respect to the impact of quantity of organic inputs on yield parameter. The trends indicate that the normalised yield of organic farms was matching or even exceeding the counterparts at a particular range in almost each of the organic input used. However, majority of organic farms were using organic inputs lesser than this range. Further, the study helps in understanding the magnitude of subsidy offered to chemical farming at unit farm level.

The baseline survey was designed to capture the household profile, farm profile, farm expense and income accounts, farm inputs and outputs, labour, other income sources and household assets. The questionnaire for the survey was finalised through a multi-stakeholder workshop through a participatory exercise to ensure their relevance and suitability across all the regions of the survey. An online tool was developed in m-Water platform for the household survey and executed by 15 partner organisations during the period of April-August 2022. All the data were collated, cleaned, sorted and analysed in MS Office excel. The key indicators discussed in this paper are amount of nutrient inputs added to the soil, fertiliser impact quotient, estimated cost on fertiliser subsidy, crop wise yield, normalised yield, cost of cultivation and net income.

Findings

Over 80% of the households covered under the survey are small and marginal farmers with a landholding of not more than 2 Ha and are from scheduled caste and tribe community. The average size of household is more than 5 persons and the average size of landholding is about 1.5 Ha. About 70% of the respondents had access to irrigation. About 32% of farmers were practicing natural or organic farming, 31% non-pesticide management and 37% chemical farming practices. Similar results were also reported by Teixeira *et al.* (2018) [8].

While the survey covered all three kharif, rabi and *zaid* seasons, only kharif and rabi season data were analysed due to limited sample size of *zaid* season. Paddy, maize, soybean, kodo, kutki, redgram, black gram, sesame and groundnut are the major kharif crops. Wheat, gram, mustard, pea and lentils are the major rabi crops. Urea and DAP are the major synthetic fertilisers used, amritpaani, cowdung, compost and ghanajeevamrut are the major organic inputs given to the soil. As given in Table 1, the proportion of farmers using organic inputs was similar across all types farm and the quantity of organic inputs was much higher in NPM and chemical farms. The proportion of farmers applying organic inputs was less 10% during the Rabi season. These findings are in conformity with Narayanan (2005) [1] and Sahu *et al.* (2010) [5].

Table 1: Usage of four major organic inputs across various farm types

Farm Type	Amritpani		Cow dung		FYM		Ghana jeevamrut	
	% farmers	Kg per acre	% farmers	Kg per acre	% farmers	Kg per acre	% farmers	Kg per acre
	Kharif							
OF	4%	24	22%	336	9%	66	5%	10
NPM	4%	7	34%	2240	3%	133	4%	3
CF	2%	12	34%	835	0%	9	2%	7
	Rabi							
OF	3%	25	11%	191	4%	70	4%	11
NPM	3%	11	1%	33	10%	72	3%	3
CF	1%	5	1%	2	7%	72	2%	5

Contrastingly, as given in Table 2, over 50% of chemical and NPM farmers used synthetic fertiliser at a rate of about 129 Kg and 74 Kg of urea and 73 kg and 50 Kg DAP per acre respectively. Both proportion and quantum were even more during Rabi season. Further, it was estimated that average subsidy cost was about Rs.19,153 and Rs.10,534 per acre for chemical farms and NPM farms, respectively. Similar results were obtained by Pandey and Singh (2012) [2] and Ramesh *et al.* (2010) [3].

Table 2: Usage of two major chemical fertilisers across various farm types

Farm type	Kharif					Rabi				
	Urea		DAP		Subsidy	Urea		DAP		Subsidy
	% Farmers	Kg Per Acre	% Farmers	Kg Per Acre	INR Per Acre	% Farmers	Kg Per Acre	% Farmers	Kg Per Acre	INR Per Acre
NPM	74%	74	69%	49.6	4800	74%	69.9	81%	67.6	5734
CF	52%	129	52%	73.0	8285	82%	167.0	83%	82.1	10868

In case of monocropping yield, all the crops except kodo and kuti during Kharif season, and linseed and lentils during rabi season had significantly higher yield in case of NPM followed by chemical farming. Even in case of multi cropping, the normalised yield estimates for each season were higher for chemical farming during both the seasons. While the cost of cultivation was significantly less in case of organic farms both in kharif and rabi, the gross income and net income were higher in case of chemical farms as given in Table 3 and 4.

Table 3: Various cost component and total cost of cultivation across farm types

	Kharif				Rabi			
	Material cost	**Labour cost**	**Other cost**	**Total COC**	**Material cost**	**Labour cost**	**Other cost**	**Total COC**
OF	1149	2667	1029	2946	2516	3257	2313	5387
NPM	3116	1992	2935	6147	3694	1905	3797	7596
CF	5514	6225	3874	13124	7679	5276	4529	16121

Table 4: Total receipts and net income per acre across farm types

	Kharif		Rabi	
	Total receipt per acre	**Net income per acre**	**Total receipt per acre**	**Net income per acre**
OF	16,215	14,077	17,905	13,749
NPM	21,453	15,660	24,034	17,144
CF	33,213	22,206	30,312	19,137

While the cost of cultivation, yield and income reflects the pasts studies and experience, the baseline data has offered fresh insights with respect to the impact of quantity of organic inputs on yield parameter. Table 5 shows the trends in normalised yield with increasing quantity of four major organic inputs used under each type of the farm. It was observed that the normalised yield of organic farms during kharif were matching or even exceeding the counterparts at a particular range in almost each of the organic input used. However, majority of organic farms were using organic inputs lesser than this range. Since the usage of the organic inputs was limited to just about 10% of the sample during rabi season, sample size was very limited to conduct similar analysis (Setty *et al.* 2013, and Singh *et al.*, 2018) [6,].

Table 5: Normalised yield for the kharif season with respect to various ranges of different organic inputs

Amrit pani (litres/acres)								
	1-100		**101-300**		**301-500**		**>500**	
	Normalised Yield	**No. of farmers**	**Normalised Yield**	**No. of farmers**	**Normalised Yield**	**No. of farmers**	**Normalised Yield**	**No. of farmers**
OF	0.70	10	0.78	5	2.54	5	0.44	2
NPM	1.08	14	1.04	5	1.32	2	0.76	1
CF	0.68	2	0.50	1	1.09	2	1.13	5
Cow dung (Kg per acre)								
	1-100		**101-500**		**501-2000**		**>2000**	
	Normalised Yield	**No. of farmers**	**Normalised Yield**	**No. of farmers**	**Normalised Yield**	**No. of farmers**	**Normalised Yield**	**No. of farmers**
OF	0.39	57	0.42	37	1.74	62	0.82	26
NPM	0.48	38	0.93	44	0.78	46	0.58	77
CF	0.70	49	1.26	42	1.95	83	0.82	81
FYM (Kg per acre)								
	1-100		**101-300**		**301-500**		**>500**	
	Normalised Yield	**No. of farmers**	**Normalised Yield**	**No. of farmers**	**Normalised Yield**	**No. of farmers**	**Normalised Yield**	**No. of farmers**
OF	0.30	12	0.47	24	0.53	10	0.44	12
NPM	0.39	4	0.22	2	0.74	5	2.07	6
CF	3.78	1		0		0	0.62	3
Ghanjeevamrit (Kg per acre)								
	1-50		**51-100**		**101-300**		**>300**	
	Normalised Yield	**No. of farmers**	**Normalised Yield**	**No. of farmers**	**Normalised Yield**	**No. of farmers**	**Normalised Yield**	**No. of farmers**
OF	1.06	6	1.75	10	0.38	10	0.54	3
NPM	0.74	13	0.99	4	1.64	4		0
CF	0.88	3	1.02	3	0.97	4		4

(Note: Normalised yield value of 1 is equivalent to the state average of a given crop. This approach could be adopted for both mono and multicrop. Higher the value means high the aggregated yield per unit land.)

Conclusion

This study helps us to understand various parameters of interest like quantum of inputs, cost of cultivation, fertiliser subsidy, yield, income and impact of organic inputs on normalised yield among farmers in different stages of transition from chemical farming to agroecology-based farming. The key findings from the study are the limited usage of organic inputs especially in organic farms, the subsidy offered to chemical farms through fertilisers subsidy, and the impact of organic inputs on normalised yield.

The study indicates that though standardisation is not the approach adopted in natural farming, there is a need for standards with respect to basic composition of input, quantum of inputs, etc. It is essential to identify the front runners among farmers, document and analyse their practices to derive and offer standards for others. In order to make strides towards scaling up of Agroecological farming, there is a need for more research and data on natural farming practices and outputs.

References

1. Narayanan S. Organic farming in India: Relevance, problems and constraints. Department of Economic Analysis and Research, National Bank for Agriculture and Rural Development, Mumbai; c2005.
2. Pandey J, Singh A. Opportunities and constraints in organic farming: an Indian perspective. Journal of Scientific Research. 2012;56:47-72.
3. Ramesh P, Panwar NR, Singh AB, Ramana S, Yadav SK, Shrivastava R, *er al*. Status of organic farming in India. Current Science. 2010;98(6):1190-1194.
4. Roychowdhury R, Banerjee U, Sofkova S, Tah J. Organic farming for crop improvement and sustainable agriculture in the era of climate change. Online Journal of Biological Sciences. 2013;13(2):50-65.
5. Sahu RP, Singh RJ, Singh K. Knowledge gap about organic farming practices of farmers of Bageshwar District of Uttarakhand. Indian Journal of Extension Education. 2010;45(1&2):135-136.
6. Shetty PK, Hiremath MB, Murugan M. Status of organic farming in agro ecosystems in India. Indian Journal of Science and Technology. 2013;6(8):5083-5088.
7. Singh R, Ravisankar N, Prasad K. Improvement in productivity and economics of major food production systems of India through balanced dose of nutrients. Current Science. 2017;112(12):2470-2474.
8. Teixeira HM, Berg L, Cardoso IM, Vermue AJ, Felix J, Bianchi JA, Claros MP, Tittonell P. Understanding farm diversity to promote agroecological transitions. Sustainability. 2018;10(4337):1-20.