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Impact of Soil Health Card Scheme on Farmers' Income – A Case Study of *Kharif* Crops in Madhya Pradesh§

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Abstract

The paper has analysed the impact of Soil Health Card Scheme on farmers' income by studying the economics of cultivation of three major *kharif* crops paddy, soybean and maize in Madhya Pradesh. For study, data were collected from 30 soil tested farmers/beneficiaries before and after application of recommended doses of fertilizers (RDF). The study has found that yield of paddy, soybean and maize increased by 19.42 per cent, 13.79 per cent and 9.6 per cent, respectively after adoption of RDF. The net income per acre increased from ₹ 11231 to ₹ 17385 (54.8%) in paddy, from ₹ 6696 to ₹ 11228 (67.7%) in soybean and from ₹ 3380 to ₹ 8105 (139.8%) in maize after soil testing by the farmers. The BC ratio increased from 1.5 to 1.7 in paddy, from 1.6 to 2.0 in soybean and from 1.4 to 1.9 in maize on adoption of RDF by the farmers. Thus, soil health card scheme was found highly beneficial to the farmers in term of increasing their income. However, there is a need to generate awareness about the benefits of this scheme among the farmers on one hand and strengthening of soil testing services / laboratories on the other hand for a wider adoption of RDF.

Key words: Soil health card scheme, farmers' income, paddy, soybean, maize, Madhya Pradesh

JEL Classification: D02, Q12, Q15,Q24,Q38

Introduction

The soil health card (SHC) is a complete evaluation of the quality of soil right from its functional characteristics to water and nutrients content and other biological properties. It contains corrective measures that a farmer should adopt to obtain a better yield. The SHC helps the farmers as the farmers get a well-monitored report about the soil and they are guided by the experts to improve soil health. It also helps the farmers to get crop-wise recommendations of nutrients and fertilizers required in each type of soil. This can help in increasing the crop yield.

The SHC scheme was launched in February 2015, and by July 2015, more than 34 lakh cards have been issued. Across the states in India, Andhra Pradesh leads in the distribution of the Soil Health Cards to farmers. The two other states, Tamil Nadu and Punjab, have collected the maximum number of soil samples for testing during the *kharif* season. Some other states which have shown lead are Uttar Pradesh, Chhattisgarh, Telangana, Odisha and Madhya Pradesh.

In Madhya Pradesh, the SHC scheme is being implemented in all the districts through 103 soil testing labs (30 under State Department, 26 under Madhya Pradesh State Agriculture Marketing Board and 47 under Agricultural Universities) running under the control of State Agriculture Department.

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The soil testing is a proven scientific tool to evaluate soil fertility and recommending balanced nutrition to crops. However, the soil testing programme in India has failed to create the desirable impact on the farming community due to extremely poor coverage and delay in timely dissemination of fertilizers recommendation to farmers (Biswas, 2002).

Considering all the above facts, the present paper has analysed the impact of soil test technology on economics in cultivation of major *kharif* crops in Madhya Pradesh.

Data and Methodology

The study was conducted in two districts Jabalpur and Sehore, of Madhya Pradesh, in which the SHC scheme was implemented since its inception year 2015-16. For study, one block from each selected district, one village from each block and 15 soil tested farmers from each chosen village were selected randomly. An equal number of control farmers were also selected from the same villages. Thus, the study had 30 soil tested farmers/beneficiaries who reported on before and after implementation of SHC scheme. Three major *kharif* crops, viz. paddy, soybean and maize were taken to study the impact of soil test technology on farmers' income.

Results and Discussion

Yield of *Kharif* Crop

A remarkable change in yield of selected *kharif* crops, viz. paddy, soybean and maize, was observed before and after getting soil tested in the area under study. On application of recommended doses of fertilizer (RDF) the yield of paddy, soybean and maize increased by 19.42 per cent, 13.79 per cent and 9.3 per cent, respectively (Table 1).

Table 1. Impact of application of recommended doses of fertilizers on crop yield in Madhya pradesh

(Kharif-2015)

Crop	Average yield (quintal/acre)		% Change
	Before	After	
Paddy	20.6	24.6	19.42
Soybean	5.8	6.6	13.79
Maize	6.3	9.3	3.00

Visible Changes

The most important changes observed after the application of RDF were (i) reduction in application of other inputs like seed, labour, pesticides, etc. (66.70%), (ii) improvement in soil texture (60.00%), and (iii) increase in crop yield (55.60%). The important changes observed were (i) improvement in crop growth (70%) and improvement in grain filling (61%) (Table 2) and (ii) the lower incidences of pest and diseases after application of RDF (66.70%) was observed among the least important changes.

Impact of Soil Testing on Economics of Cultivation of *Kharif* Crops

The impact of soil testing on the economics of cultivation of selected *kharif* crops was studied and is presented in Table 3. In paddy the total cost of cultivation increased by 12.91 per cent, from ₹ 23639 to ₹ 26691 per acre, but net income also increases by 54.79 per cent from ₹ 11231 to ₹ 17385 per acre (Table 3). The return per rupee investment also

Table 2. Changes reported after application of recommended doses of fertilizers to *kharif* crops in Madhya Pradesh

(% of farmers)

Change	Most important	Important	Least important	Total
Increase in crop yield	55.60	11.40	33.00	100
Improvement in soil texture	60.00	13.30	26.70	100
Improvement in crop growth	13.33	70.00	16.67	100
Improvement in grain filling	11.10	61.00	27.90	100
Lower incidence of pest and diseases	10.00	23.30	66.70	100
Reduction in application of other inputs like seed, labour, pesticide etc.	66.70	13.30	20.00	100

Table 3. Impact of soil testing on economics of cultivation of major kharif crop in Madhya Pradesh

(₹/acre)

Variable	Before soil testing	After soil testing	Difference
	Paddy		
Total cost	23639	26691	3052(12.91)
Gross income	34870	44076	9205(26.40)
Net income	11231	17385	6153(54.79)
B:C ratio	1.5	1.7	0.2(13.33)
	Soybean		
Total cost	10900	10714	-186(-1.70)
Gross income	17596	21942	4346(24.70)
Net income	6696	11228	4532(67.70)
B:C ratio	1.6	2	0.4(25.00)
	Maize		
Total cost	8176	9235	1058(12.94)
Gross income	11556	17340	5784(50.05)
Net income	3380	8105	4726(139.83)
B:C ratio	1.4	1.9	0.5(35.71)

Note: Figures within the parentheses show percentage difference after soil testing

increased from ₹ 1.50 to ₹ 1.70 after the farmers got their soil tested.

In soybean, the total cost of cultivation decreased by 1.7 per cent from ₹ 10900 to ₹ 10714 per acre but net income increased by 67.7 per cent from ₹ 6696 to ₹ 11228 per acre. The return per rupee investment also increased from ₹ 1.60 to ₹ 2.00 after the farmers got their soil tested.

In maize, the total cost of cultivation increased by 12.94 per cent from ₹ 8176 to ₹ 9234 per acre and net income increased by 139 per cent from ₹ 3379 to ₹ 8105 per acre. The return per rupee investment was also increased from ₹ 1.40 to ₹ 1.90 after soil testing by the farmers (Table 3).

Conclusions

The study has concluded that adoption of RDF as per SHC leads to reduction in the application of other inputs like seed, labour, pesticides, etc. (66.7%), improvement in soil texture (60.0%) and increase in crop yield (55.6%) were observed by the majority of households after the application of RDF. At the same time, they also started adopting the recommended package of practices (RPP) for cultivation of other crops as they got the opportunity to contact officials of the department of agriculture, scientists of SAUs and KVKs and farming facilitators resulting in reduction in expenditure on fertilizers and other inputs, thereby cost of cultivation. It could lead to increase in farmers' income.

The constraints reported by the farmers in adoption of recommendations included high cost, difficulty in adoption, low credibility of soil testing report, and long distance to laboratory (Chouhan *et al.,* 2012).

There is ample scope to improve the analysing capacity as well as dissemination ability of soil testing laboratories. This, coupled with professional management through proper linkages, can bring radical changes in soil testing services in the state (Sharma *et. al.,* 2015).

It is suggested that the issued SHCs need to be periodically updated so that the farmers remain aware about the changing fertility status of their land. The awareness generation regarding spraying, fertigation and drilling method of fertilizers application is also needed among the farmers. The advantages of adoption of recommendations of soil testing may be disseminated among the farmers along with strengthening of extension service delivery in the state.

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