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SHORT COMMUNICATION

ADOPTION BEHAVIOR OF SOIL HEALTH CARD IN FARMING COMMUNITY OF BETUL DISTRICT OF M.P.

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Abstract: The Government of India launched the soil health card scheme during 2014-15. In this way, the state labels government agencies as well as NGOs, establishes soil health labs and mini soil health labs, and collects soil samples using GPS-based and grid-based methods. After analysis, large numbers of soil health cards (SHCs) are issued. Given the inception of the soil fitness card programme at some point of 2020-21, a good way to grow agricultural production and maintain soil health, a large quantity of soil health playing cards had been distributed to the farmers. This will examine the know-how, adoption and constraints of the soil health card. The existing study was completed. The farmers who were issued a soil health card were comparatively more aware of numerous soil health card aspects like main nutrients (N, P & K), soil pH, soil EC, Soil OC and micronutrients in comparison to farmers without a soil health card. Information suggests that the maximum number of respondents had a medium know-how rating, that is, fifty-six. Ninety-five per cent, according to the cent, followed by respondents with low expertise rating (28.34%), and the best 19.44 per cent respondents had high know-how rating, approximately soil fitness card. Important constraints confronted by the farmers in adoption consistent with the soil fitness card were difficulty in having expertise about the significance of micronutrients, the prices of fertilizers being too high and the non-availability of organic manure.

Keywords: Adoption, Constraints, Farmers', expertise, Soil Health card

INTRODUCTION

The Soil Health Card is a program started by the Government of India and managed by the Ministry of Agriculture and Farmers' Welfare. It is carried out by the Agriculture Departments of all states and union territories. The card is given to farmers to keep track of their soil's current condition and to see how it changes over time because of how the land is managed. Each Soil Health Card shows important information about the soil's health, using terms that are easy to understand. These details are based on what farmers know from their own experience and the natural resources in their area. The card lists soil health factors that can be checked without special tools or lab tests. It is a printed paper that a farmer gets for each of his fields. The card shows how the soil is doing in 12 different ways: N, P, K (which are main nutrients); S (a secondary nutrient); Zn, Fe, Cu, Mn, Bo (which are micro-nutrients); and pH, EC, OC (which are physical properties). Based on these details, the card also gives advice on which fertilizers to use and what changes to make to the soil. It includes suggestions on the right amount of each nutrient needed to get the best harvest.

MATERIALS AND METHODS

The study was carried out in the Betul district of Madhya Pradesh. Soil Health Cards were prepared in all the blocks of Betul district, which include Chicholi, Multai, Aamla, Prabhatpattan, Bhaisdehi, Aathner, Sahpur, Ghodadongri, and Bhimpur. Blocks were selected for the study based on certain criteria. There were 10 blocks in the selected district where Soil Health Card activities were ongoing during the year 2020-21. From each selected block, three villages were chosen randomly. This way, a total of 10 blocks were selected from the identified district. From the list of selected villages, 40 panchayats were picked, and from each of these panchayats, 10 soil health card-holding farmers were selected randomly. Thus, a total of 400 farmers were chosen using a

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random sampling method from the identified villages. An interview schedule was created that included tools to measure the variables. The schedule was checked for reliability and validity to make sure the information collected from the respondents was accurate. The responses were collected through personal interviews. These responses were then converted into scores and entered into a master table for analysis using appropriate statistical methods. The information was collected from the Betul district through a developed interview schedule. The district is divided into ten blocks, namely Chicholi, Multai, Aamla, Prabhatpattan, Bhaisdehi, Aathner, Sahpur, Ghodadongri, and Bhimpur. In every block, four panchayats were picked at random, and from each of those panchayats, ten farmers who had soil health cards were randomly selected for the study. This led to interviewing 400 farmers from 40 panchayats, and their results were analysed using statistical methods. The farmers who were interviewed had been educated about the importance of soil health cards in crop production by KVK scientists through various extension activities.

Constraints in adoption of soil health management practices: According to Wubneh and Sanders (2006), livestock plays an important role in a farming system because they provide a lot of manure and help with plowing the soil. The more livestock a farmer has, the better they can use manure to keep the soil healthy and fertile. Having too few livestock is a problem because it makes it hard for farmers to use organic fertilizers and new types of crops. Damisaand Igonoh (2007); Odendo *et al*. (2006); Rege (2006), and Sanginga and Woomer (2009) have said that farmers in Western Kenya are not adopting Integrated Soil Fertility Management (ISFM) because they expressed a lack of access to reliable and up-to-date information, and there is a big gap in communication between researchers and farmers. Ofuoku *et al*. (2008) and Sanginga and Woomer (2009) also mentioned that the low literacy levels among small-scale farmers in Sub-Saharan Africa make it difficult to share and understand soil fertility information, which stops them from accessing it. Bennett and Cattle (2014) listed several issues that stop farmers from using soil health management plans. These issues fall into six main groups: problems with education and training, issues with agencies and extension services, challenges related to how land is used, difficulties in the market, economic problems, and personal and social barriers.

RESULTS AND DISCUSSION

The data in Table 1 shows that the highest number of respondents had a medium knowledge score, which is 56. 95 per cent. This was followed by those with a low knowledge score, which accounts for 23. 61 per cent. Only 19. 44 per cent of the respondents had a high knowledge score regarding soil health cards. These findings are supported by Bhatt *et al*. (2010). The data in Table 2 indicates that the majority of respondents had a high adoption percentage.

Table 1. Soil Science lab and Soil health card status in District Betul

Parameter	District (10 Block)	lab	Mini lab
Soil science lab	56	12	44
Distribution of soil health card (Year 2020-21)	5000	3000	2000

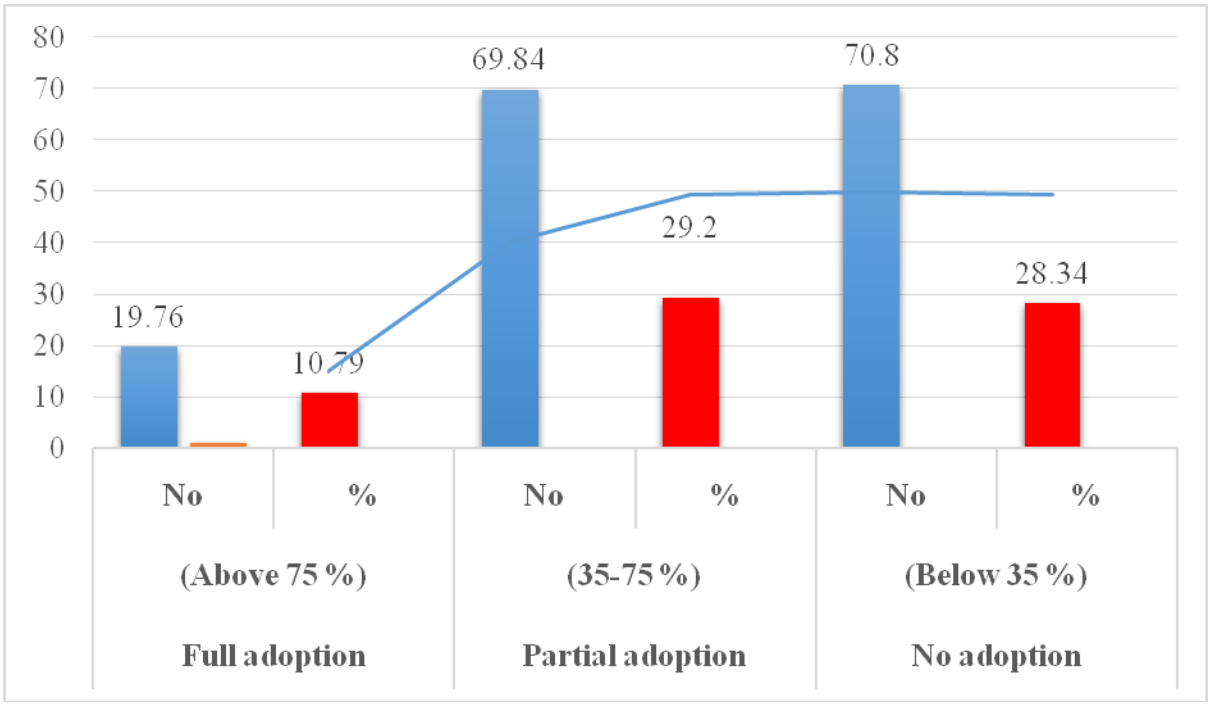
Adoption explanation: The recommendations shown in soil health cards were used above 75% by farmers were considered as full adoption. When the recommendations shown in the soil health card were used, 35 to 75 per cent of farmers were categorized as partial adoption, and the farmers who had used the soil health card recommendations below 35 per cent were put under the no adoption category in this study.

Table 2. Use of different variables in 400 farmers from 10 blocks, 40 panchayats, @ 10 farmers from each panchayat.

Variables	Category	No of Respondents		Full adoption (Above 75 %)		Partial adoption (35-75 %)		No adoption (Below 35 %)	
		No	%	No	%	No	%	No	%
Age	Young (18-35)	135	33.75	25	18.52	80	59.26	33	24.44
	Middle (36-55)	185	46.25	42	22.70	83	44.86	58	31.35
	Old (above 55 years)	80	20.00	11	13.75	27	33.75	41	51.25
Education	above graduation	14	3.50	10	71.43	3	21.43	2	14.29
	high school to graduation	174	43.50	26	14.94	77	44.25	72	41.38
	below high school	118	29.50	11	9.32	51	43.22	58	49.15
	illiterate	94	23.50	3	3.19	30	31.91	57	60.64

Family size	small (up to 5 members)	210	52.50	25	6.25	71	17.75	125	31.25
	large (above 5 members)	190	47.50	19	4.75	100	25.00	60	15.00
Social Status	SC	25	6.25	2	0.50	4	1.00	22	5.50
	ST	45	11.25	1	0.25	11	2.75	37	9.25
	OBC	224	56.00	31	7.75	117	29.25	88	22.00
	Other	106	26.50	3	0.75	35	8.75	59	14.75
Social participation	yes	400	100	60	15.00	156	39.00	184	46.00
Mass media exposure	yes	400	100	51	12.75	145	36.25	204	51.00
extension participation	yes	400	100	61	15.25	195	48.75	144	36.00
land holding	marginal (<1 ha)	95	23.75	4	1.00	38	9.50	55	13.75
	small (1-2 ha)	109	27.25	9	2.25	63	15.75	39	9.75
	medium (2-4 ha)	135	33.75	13	3.25	71	17.75	49	12.25
	Large (> 4 ha)	61	15.25	7	1.75	29	7.25	23	5.75
Household Type	Kaccha	235	58.75	13	3.25	91	22.75	134	33.50
	Pakka	165	41.25	18	4.50	67	16.75	77	19.25
Farmers Income	low(<1 lakh)	108	27.00	15	13.89	72	66.67	23	21.30
	medium (1-2 lakh)	165	41.25	22	13.33	88	53.33	52	31.52
	high (> 2 lakh)	127	31.75	12	9.45	42	33.07	74	58.27
Overall adoption				**19.76**	**10.79**	**69.84**	**29.20**	**70.80**	**28.34**

The data in Table 2 shows that most respondents had a high percentage of adoption.



Graph 1- High adoption percentage of the maximum number of respondents

Extent of Adoption-The results from the analysis on how much farmers followed the SHC recommendations are shown in Graph 1. From the graph, it is clear that among those who followed the SHC recommendations, 100% of the farmers followed them exactly without making any changes. On the other hand, among those who did not follow the recommendations, a large number had adopted more than the recommended amount. About 19. 76% to 70. 8% of these farmers used more than the suggested inputs, while 10. 79% used less. It was found that most farmers used more inputs than recommended. When asked why, they said they found the recommendations unreliable, it was hard to use the exact amount of fertiliser, the soil samples were collected in an unscientific way, the

recommendations didn't fit their local conditions, they hoped for higher returns by using more, and they followed other farmers who used more fertiliser.

Constraints among farmers about the Soil Health Card

The information shown above shows that most farmers (70.80 per cent) had trouble understanding why micronutrients are important. Also, 68 per cent said the cost of fertilisers was too high. Around 69. 84 per cent mentioned that there wasn't enough organic manure available. This pattern was also found in a study by Patel and Chauhan (2012) (Table 2). From this study, it's clear that most farmers had only medium knowledge about soil health cards. The main problems they faced in using soil health cards were not knowing the importance of micronutrients, high fertiliser prices, and a lack of organic manure. Farmers who had soil health cards were more aware of things like the main nutrients (N, P, and K), soil pH, soil EC, and micronutrients, compared to those without the cards. So, it's recommended that government officials create good programs and train farmers to use soil health cards as much as possible.

Level of knowledge -About adopting technology means deciding to use a new idea as the best option available. This process involves changing how a farmer thinks and acts from the moment they learn about the technology until they use it (Akubuilo et al., 1982). In this study, knowledge about soil testing was examined using some variables. The data showed that 52% of the people surveyed had a high to very high level of knowledge about soil testing and their views on using soil health cards in modern farming. Knowledge of the benefits of soil testing was found to be very important for the soil health card program. Agbamu's (1993) research showed that farmers' understanding of technology helped them adopt it. They found the technology useful and important because it helped reduce input costs, showed the benefits of soil testing, and made it easier to use soil health cards in their farming. Chowdary et al. (2016) also found that more than two-thirds (67%) of the people surveyed were very satisfied with the advice given through soil health cards. These findings agree with the results from Srivastava and Pandey (1999), Yadav *et al*. 1 (2005), Pagaria (2011), and Patel and Chauhan (2012). To show how important this technology is, the state government regularly gives advice to help farmers use fertilizers more balanced and efficiently, based on soil testing and soil health cards.

Constraints in adopting the technology were found during the first round. 0.33 respondents reported low or very low use of the encouraged technology in the Petlad taluka area. These respondents mentioned that problems with using the technology limited how much they could adopt it. These issues should be considered for future studies. According to farmers, the main problems are: a) It's hard to understand soil testing, b) delays in getting test reports, c) difficulties in following fertiliser advice from the test, d) no real increase in crop yield, and e) no proper scientific guidance. It can be concluded that most respondents from Petlad taluka are of middle age and literate. Most of them (68%) have medium to high knowledge about the benefits of soil testing and the use of soil health cards (SHC). Educational awareness and the availability of local labs to test soil samples are the most important factors influencing the adoption of this technology. Therefore, based on the problems faced and reported by farmers, more scientific and educational training and facilities are needed to spread this technology widely. Extension workers can play a key role in overcoming the barriers to adopting this technology.

CONCLUSION

Most farmers have a medium level of knowledge about soil health cards. The main challenges they face in using these cards include difficulty in calculating the right amount of fertiliser, high costs of fertilisers, lack of awareness about the importance of micronutrients, and the unavailability of organic manure. To address this, it is recommended that policymakers create proper programs to train farmers and other community leaders on how to effectively use soil health cards.

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