



Analyzing Adoption Impediments in Soil Health Card based Fertilizer Application by Farmers

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HIGHLIGHTS

- Education, social participation, mass media exposure, extension participation and farmer's income level had a non-significant relationship with perception of Soybean and Wheat cultivators about the utility of Soil Health Card based
- The full adoption of SHC based application of fertilizers dose by farmers was near to 10 percent, partial adoption by 50 per cent and no adoption by 41 per cent.

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ABSTRACT

The study was completed in Harda district of Madhya Pradesh. Present study was completed in the year 2023. The average data of continuous SHC based study and extension based responses were collected through developed interview schedule, random group discussion, meetings and personal interviews and data was analyzed to find out the adoption extent, impediments, regarding of soil health card based recommendations among farmers of different villages provided or benefited under different schemes of state departments and Krishi Vigyan Kendra and line departments. The importance of soil health card based fertilizers use was told to farmers before the response collection in the initiation of crop season through training and other awareness programmers. The impediments were recorded to know the status of adoption of soil health card based fertilizers application among farming community in Soybean and Wheat major crops. The continuous motivation of educated farmers having good social participation and mass media exposure by KVK scientists through conducting SHC based trials and demonstrations, backstopping by field extension activities and success story sharing have significant role in enhancing the adoption rate and balance use of fertilizers doses for improving farmers income and cost saving in Harda district of Madhya Pradesh.

INTRODUCTION

Madhya Pradesh is one of the leading states as recipient of Krishi Karman Award since 2011-12. Madhya Pradesh has received this award 7 times till 2025. The Krishi Karman Awards was given for total food grain production category in year 2011-12, 2012-13 and 2014-15 for wheat production in 2016-17 followed pulse production in year 2017-18 (PRO-MP, 2025). The malawa region of MP state has maximum contribution in overall production of

cereals and pulses. The district Harda has witnessed the highest productivity of wheat and Chickpea in the state many times. The farmers of this region are used to chemical fertilizers more than recommendations; therefore the suitability of soil health card was more to create wide awareness and importance of judicious use of fertilizers dose by farmers. The competitiveness of highest production of food and pulse grains among farmers was also seen which makes the study more just to the topic. The soil health card (SHC) a printed document prepared in soil testing lab by experts

was furnished to the farmers for important information on the major available soil nutrients. The recommendations dose of chemical fertilizers was circulated to sustain productivity and soil health. Farmers of this region used three crops cultivation continuously round the year due to canal irrigation availability in rabi and summer season. The reason being farmers were using enough quantity of chemical fertilizers in their crops for exploiting maximum yield. The common perception observed that the reduction in fertilizers dose may reduced their production of crops as also witnessed in Haryana state (Ohlan et al., 2025). The use of soil health card is more important to get good yield and for better soil health. Although, the soil health card scheme found beneficial for farmers. Farmers were motivated for adoption of soil health card based recommendations by scientists and extension workers. There is need to assure farmers that by using recommended doses and by cutting over doses of fertilizers they can get maximum yield. Farmers who were aware of this soil health testing scheme but still unable incorporate recommendations dose due several constraints like unavailability of input during the showing time, lack of capital to purchase fertilizer, technical knowledge, difficult to understand SHC dose application and other personal socio-psychological barriers.

The SHC adopter farmers have reduced their usual doses of Nitrogen, Phosphorus and Potash especially nitrogen helped them reduce the fertilizer use which ultimately leads to decrease in cost of cultivation (Reddy, 2017). It has been witnessed by many reports in our country that the chemical fertilizer use was reduced by the adopter farmers about in the range of 8-10 per cent in average. The adoption of SHC based fertilizers use for cost saving and soil health improvement is necessary may be boost up by incorporation at farmers field level through creating wide awareness, knowledge about use of ICTs tools, social media, pluralistic extension strategies, KVKs, line departments, para extension services and adoption other innovative extension methodologies (Kumar et al., 2015; Kumar et al., 2020).

METHODOLOGY

As per the above discussed background this efforts was made to receive the farmer's response and different impediments faced by the farmers for using the recommendation of soil health cards at their field level in Harda district of Madhya Pradesh. The information was collected through developed interview schedule from Harda district. The Harda district is comprised of three blocks namely Harda, Timarani and Khirkiya from each block four Panchayats were selected randomly and from each Panchayat 25 Soil Health Card holding farmers were duly selected randomly for

collecting the information used in this study. Thus, from 12 panchayats a total of 300 farmers were interviewed and their response were analyzed by using statistical tools as correlation, percentage and frequency to make the discussion more rationale. The response of the farmers was recorded who were due taught about importance of soil health cards in crop production by KVK scientists, line departments, para extensions workers through cumulative extension activities time to time in the whole district. The collected responses of farmers were tabulated and summarized in scientific manner for putting them in different response categories for making the presentation more meaningful. The weather parameters, availability of inputs at sowing time and during critical need also were taken care as parameter for adoption of all soil health card based recommendation by the farmers. Study was completed during 2021-2023.

The lab tested sample based recommendations shown in soil health cards were used as such above 75 per cent by farmers were considered as full adoption. When the recommendations shown in soil health card and used 35 to 75 per cent by farmers were categorized as partial adoption and the farmers who have used soil health card recommendation below 35 per cent were put under no adoption category in this study. The different impediments faced by farmers for smooth adoption and practice the information were also recorded and instant solutions were also being facilitated to the respondent farmers during study by scientists and other extension personnel in the district.

RESULTS

The major impediments for not adoption of soil health card based fertilizers dose by the SHC holder farmers was perceived due to lack of capital availability to purchase fertilizers (13.33% farmers) followed by unavailability of fertilizers during need (13.00% farmers) in case of soybean crop. In case of wheat crop again no adoption seen due to unavailability of fertilizers during need (19.00% farmers) followed by lack of capital availability to purchase fertilizers by (9.67% farmers). The findings are witnessed by Singh et al., (2023) & Charel et al., (2018). The major impediments responsible for partial adoption in case of soybean crop were perceived as lack of capital availability to purchase fertilizers by (18.33% farmers) followed by personnel socio-psychological barriers by (12.00% farmers). In case of wheat crop the unavailability of fertilizers during need by (14.67% farmers) followed by lack of capital availability to purchase fertilizers by (12.33% farmers). The above finding is in line with a study done by Kumar & Rani (2018) & Jayalakshmi et al., (2021).

Table 1. Major impediments for partial and non adoption of SHC based fertilizer doses

Major impediments	Soybean Crop		Wheat Crop	
	Partial Adoption (%)	No Adoption (%)	Partial Adoption (%)	No Adoption (%)
Unavailability of fertilizers during need	8.00	13.00	14.67	19.00
Lack of capital availability to purchase fertilizer	18.33	13.33	12.33	9.67
Lack of technical knowledge	2.67	1.67	4.33	2.00
Difficult to understand SHC dose application	2.00	1.67	3.33	1.00
Report was not available on crop sowing time	7.00	8.00	5.33	6.67
Personal socio-psychological barriers	12.00	3.33	10.00	2.67

Table 2. Socio-economic variables relationship with the adoption of SHC based recommendations

S.No.	Variables	Correlation coefficient
1	Age	0.042
2	Education	0.488*
3	Family size	0.034
4	Social participation	0.338*
5	Mass media	0.376*
6	Extension participation	0.506*
7	Land holding	0.041
8	Farmers income	0.336*

*5% level of significance

The correlation analysis of perception indicated that the positive and significant relationship at a five percent level with education, social participation, mass media exposure, extension participation and farmer's income level whereas age, family size and land holding had a non-significant relationship with perception of Soybean and Wheat cultivators about the utility of Soil Health Card based recommendations in crop production. The acceptance of Soil Health Cards (SHCs) by the Soybean and Wheat crops cultivators exhibits a diverse response, with several significant factors influencing the adoption rates of fertilizers doses at field and farmer's level. The all significant variables are positively associated with adoption levels and indicating their pertinent roles in influencing farmer adoption behavior towards SHCs based fertilizers recommendation. On the other hand non significant variable has not positive impact on adoption rates of the said practices. The above findings are also being witnessed by Chaudhary & Theodore (2016); Madhuri et al., (2024) & Lal et al., (2025).

DISCUSSION

The present study has revealed the full adoption by fewer respondents beyond good backstopping efforts by KVK scientists and other extension personnel. The study revealed that the different impediments face by farmers in adoption of soil health card based fertilizers recommendation in their crops like unavailability of fertilizers and other agri-inputs during critical need of application, lack of capital availability to purchase fertilizer round the year, lack of technical knowledge to use different inputs and their role for crop yield, difficult to understand soil health card based dose application in the crops, sometime the soil testing report was not available on crop sowing time and other several personal socio-psychological barriers that found responsible to hinder the adoption of this technology. There were several socio-economic and personal variables were studied and found in the line of referenced researchers but in my study the economic status or farmers income was found significantly correlated to adoption of soil health card based recommendation because of the purchasing power, handling and storage facilities of agri-inputs in the district. The less resourceful farmers sometime get reluctant in using the inputs and soil testing, soil sample collection and sending to lab perceived as tedious job hence less adoption rate was witnessed among this group of farmers. The regular use of potash was also not practiced by farmers followed by zinc at the different intervals. The study done by Madhuri et al., (2024), shown that the annual income of paddy

growing farmers was found non significant in adoption of soil health card based recommendation in the Andhra Pradesh during 2023-2024 and but in same way the economical benefits reaped significantly by soil health card used farmers in MP said by Singh & Kushwah (2020) followed by integrated fertilizer management was seen economical beneficial for paddy famers in Jharkhand state by Jha et al., (2021) & Ankhila et al., (2023).

The strong extension network at grassroots level of farmers still a need for improving their crop yields, crop diversification, and innovation, hi tech based technical interventions. The technological failure compensation responsibility may be taken into consideration by the concerned extension institute or government, this may enhance the adoption and penetration rate of any new technology, practice, methods or input or recommendation in the farming community. The integrated efforts of KVK scientists, line departments, para extension workers, NGOs, volunteer organization and farmer to farmer extension, different levels of partnership as part of pluralistic approach may be fruitful to boost adoption rate different scientific recommendations and expected results. The social media is also played very crucial role in transforming the agricultural growth and management, marketing linkages, transportation, and round the year supply of different agriculture produce with sustainable value chain in the country. The present findings related to adoption and economical impact of SHC is being aligned with Sahay et al., (2019); Subhash et al., (2019) & Patel et al., (2021).

CONCLUSION

The farmer's education status, income, social participation, mass media exposure played an important role in decision making and adoption at field level by without creating doubts and fear of yield loss. The non availability of fertilizers at critical time and less purchasing power of farmers, traditional mindset found as major impediments in adoption of SHC based recommendations of fertilizers. The continuous motivation by para extension workers, line department and KVK scientists play significant role in enhancing the adoption rate and balance use of fertilizers doses for improving farmers income and cost saving in Harda district of Madhya Pradesh.

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