



Impact of Soil Health Card on Wheat Growers of Jabalpur District, India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Soil Health Management aims at judicious and responsible use of chemical fertilizers on farms maintaining micro and macro nutrients of soil. The Soil Health Card scheme was started by Government of India in 2015 which offers a qualitative evaluation of soil health by collecting soil samples & testing the vital parameters. Soil health card lays more focus on chemical nutrient indicators, whereas physical and biological properties are not included. A study was conducted in Patan block of Jabalpur district on proportionate random sample 120 wheat growers who were also Soil health card beneficiaries. It was found that most of the respondents were of medium adoption

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followed by low adoption of Soil health card. It was also observed that the variable age and family type had no significant relationship with soil health card adoption. The variables education, land area under wheat crop and annual income had positive and significant relationship with soil health card adoption at 5 per cent level of probability. While the variables caste, extension contact, sources of information, awareness of soil health card and scientific orientation had positive and highly significant relationship with adoption of Soil health card at 1 per cent level of probability.

Keywords: Soil health card; wheat growers; macro nutrients; crop.

1. INTRODUCTION

Soil Health Management is one of the critical components under National Mission for Sustainable Agriculture (NMSA). It aims at judicious and responsible use of chemical fertilizers on farms maintaining micro and macro nutrients of soil.

“The Soil Health Card Scheme was launched in India on February 19, 2015 at Suratgarh, Rajasthan (Bisariya et al 2023) and is a flagship program by the Department of Agriculture and Co-operation under the Ministry of Agriculture and Farmers Welfare, Government of India. Under the programme, farmers receive soil health cards (SHCs) from the government which includes nutritional status of soil crop-specific recommendations for the nutrients and fertilisers needed for every individual land holding. The goal of this is to assist farmers in increasing output by using inputs judiciously. The Soil Health Card Scheme offers a qualitative evaluation of soil health by collecting soil samples & testing the vital parameters and the necessary reclamation actions for soils which cause problems.” (Rani et al 2024)

SHC contains the status of soil with respect to 12 parameters:

- N, P, K (Macro-nutrients)
- S (Secondary-nutrients)
- Zn, Fe, Cu, Mn, Br (Micro-nutrients)
- pH, EC, OC (Physical parameters) {Viswam 2017 and <https://www.sciencedirect.com> 2025}

“Soil testing is a great tool to assess soil fertility and nutrient supplying capacity. The most crucial step in the whole programme is timely reporting of soil test results to the farmers. Speed and process should be reliable. Operation is also most important, the system and process should be in place for effective implementation of the scheme and to get accurate result soil health card is given to every individual farmer to use

inorganic fertilizer based on soil test values to lower production cost, increase profits and maintain the soil health. Soil health card lays more focus on chemical nutrient indicators, whereas physical and biological properties are not included” (Kumari et al 2022).

“Adopting sustainable soil fertility management (SFM) practices is necessary to achieve sustainable agricultural production” (Chowdary et al., 2018; Kapoor et al., 2021). The question here is how many farmers are using SFM practices. In fact, the majority of the farmers use either sub or supra-optimal levels of chemical fertilizers which result in declined soil health and inherent soil fertility. In accordance with the survey conducted by Kumar et al., (2021) revealed that knowledge level and adoption of SFM are relatively much less i.e., only eight percent of the farmers are aware of it.

“There is a need for strengthening the Soil Health Card related extension services to provide better advisories. The scheme has a poor backing of infrastructure and human resources, with significant gaps. Although some southern and western states performed better, in some states even the allocated resources are not being spent or utilized due to lack of capacities. This should be of high priority in the immediate future” (Reddy 2017 and Reddy 2019).

“There are various types of development in an economy i.e. human development, infrastructure development, social development, industrial development, and economic development. An entrepreneur plays his role as a catalytic agent in the process of economic development. In recent times, the role of an entrepreneur has been appreciating day by day. The Government of India and its partner agencies have come up with a series of promotional and development schemes for entrepreneurship, marketing, and export growth aimed at involving more and more people into entrepreneurship” (Verma and Shrivastava 2021). Soil Health Card scheme is one such launched by the Government (Bisarya et al., 2023).

Keeping the above facts in view a study was framed to assess the impact of soil health card adoption on wheat growers in Jabalpur district of Madhya Pradesh.

2. MATERIALS AND METHODS

An ex-post-facto investigation was carried out in the purposively selected Patan block of Jabalpur district of Madhya Pradesh because it had the maximum number of Soil Health Card users. Patan block comprises of 224 village, out of which 10 villages namely. Bhautiya, Chandwa, Goppur, Gwari, Jarond, Karondi, Katila, Jamkhar, Amarpur, and Hirapur were selected purposively on the basis of the maximum number of SHC holder & wheat growers. The respondents from the 10 selected villages were chosen on the basis of proportionate percentage (10%) distribution.

Extent of adoption was operationally defined as the degree to which recommended doses of fertilizers and manures for a particular area, crop and season in relation to that of the fertility status of the soil that was accepted and practically applied by the farmer as per the soil health card information/recommendation. A schedule was developed consisting of recommended practices as that of soil health card. The response for each of the practice was measured on three-point

continuum that is high adoption, medium adoption and low adoption.

The collection of the data was done with help of four-point continuum scale that is over adoption, adoption as per recommendation, below adoption, and no adoption. Scores assigned were 4,3,2, and 1 respectively. The farmers were categorized into three categories taking mean and standard deviation as a measure of check.

A structured interview schedule was developed by researcher and the primary data was collected by personal interview. The correlation coefficient ('r' value) was used for measuring the relationship between dependent and independent variables. The correlation coefficient between two groups was calculated by using the following formula.

$$r = \frac{n (\sum xy) - \sum x \sum y}{\sqrt{[n^* (\sum x^2 - (\sum x)^2)] * [n^* (\sum y^2 - (\sum y)^2)]}}$$

where,

- Σx = Total of the First Variable Value
- Σy = Total of the Second Variable Value
- Σxy = Sum of the Product of & Second Value
- Σx² = Sum of the Squares of the First Value
- Σy² = Sum of the Squares of the Second Value
- n = sample size

Table 1. Number of respondents from the ten selected villages

S.No.	Name of village	Total no. of soil health card holders	No. of Respondents
1	Gwari	210	21
2	Chandwa	190	19
3	Majhgawan	170	17
4	Bhautiya	150	15
5	Amarpur	130	13
6	Goppur	110	11
7	Jarond	80	8
8	Kanti	70	7
9	Karondi	50	5
10	Luhari	40	4
Total		1160	120

Table 2. Mean and standard deviation score based on the three categories of farmers

S.No.	Categories	Score
1.	Low adoption	<Mean – SD
2.	Medium adoption	Mean – SD < > Mean + SD
3.	High adoption	>Mean + SD

3. RESULTS

3.1 Impact of Soil Health Card in Terms of

Extent of adoption of soil health card among the wheat growers: Extent of adoption of soil health card among the wheat growers was computed and has been presented in Table 3.

The data presented in Table 3 shows the percentage distribution of respondents according to their Extent of adoption of soil health card. Out of total respondents, majority belonged to medium adoption (65 %) followed by low adoption (20 %), and high adoption (15 %).

Thus, it can be concluded that most of the respondents were of medium adoption followed by low adoption.

Production level of wheat crop among the wheat growers was computed and presented in Table 4.

The data presented in Table 4 shows the percentage distribution of respondents according to their level of production of wheat before SHC possession. Out of total respondents, majority belonged to medium production (39.01 to 79 qt) (74.17 %) followed by high production (above 79 qt) (13.33 %), and low production (up to 39 qt) (12.50 %).

Thus, it can be concluded that most of the respondents were of medium production followed by high production (Patel et al., 2009).

Table 3. Extent of adoption of soil health card among the wheat growers (n=120)

S. No.	Categories	Frequency	Percentage
1	Low adoption of Soil Health Card (Up to 21 score)	24	20.00
2	Medium adoption of Soil Health Card (22 to 30 score)	78	65.00
3	High adoption of Soil Health Card (above 30 score)	18	15.00
Total		120	100.00
Mean= 25.45		SD= 4.26	

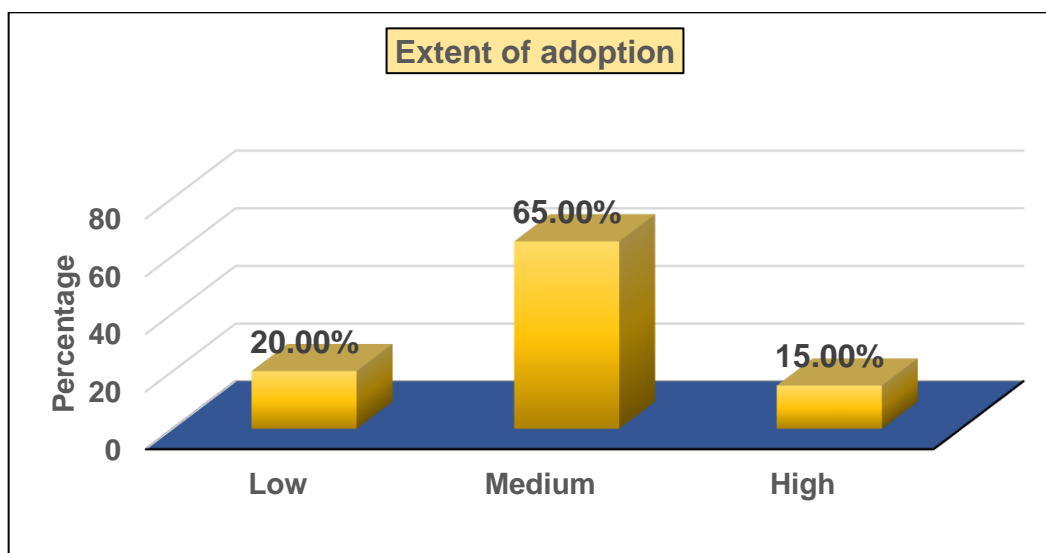


Fig. 1. Distribution of respondents according to their extent of adoption

Table 4. Production of wheat before SHC possession among the wheat growers

S. No.	Categories	Frequency	Percentage
1	Low production (up to 39 qt)	15	12.50
2	Medium production (39.01 to 79 qt)	89	74.17
3	High production (above 79 qt)	16	13.33
Total		120	100.00
Mean= 59.01		SD= 19.59	

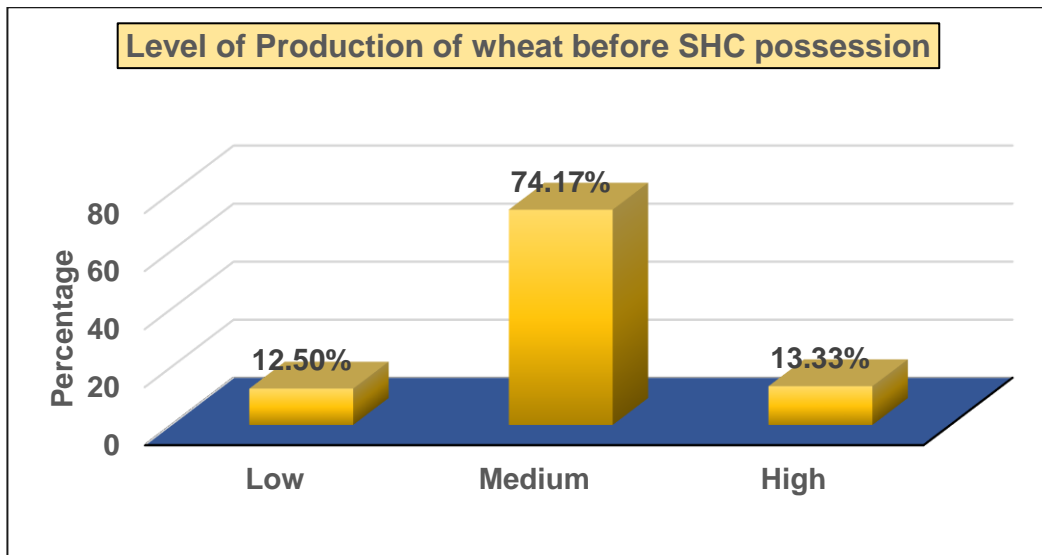


Fig. 2. Distribution of respondents according to their level of production of wheat before SHC possession

Table 5. Level of production of wheat after SHC possession among the wheat growers

S. No.	Categories	Frequency	Percentage
1	Low Production (up to 43 qt)	16	13.33
2	Medium Production (43.01 to 84 qt)	88	73.34
3	High Production (above 84 qt)	16	13.33
Total		120	100.00
Mean= 63.57		SD= 20.18	

The data presented in Table 5 shows the percentage distribution of respondents according to their level of production of wheat after SHC possession. Out of total respondents, majority belonged to medium production (43.01 to 84 qt) (73.34 %) followed by high production (above 84

qt) (13.33 %), and low production (up to 43 qt) (13.33 %).

Thus, it can be concluded that most of the respondents were of medium production followed by high and low production equally.

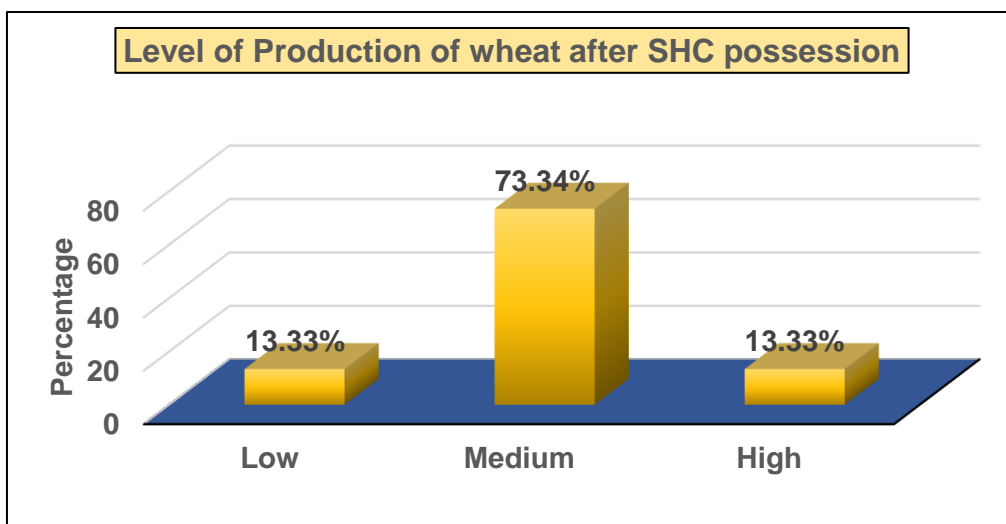


Fig. 3. Distribution of respondents according to their level of production of wheat after SHC possession

Table 6. Correlation analysis between dependent and independent variables.

S. No.	Independent variables	Correlation coefficient ('r')	Z- test value
		Adoption	Production
1	Age	0.0196 ^{ns}	
2	Education	0.1841 [*]	
3	Caste	0.2325 ^{**}	
4	Family type	0.0713 ^{ns}	
5	Land area under wheat crop	0.1939 [*]	
6	Annual income	0.2183 [*]	1.7751 [*]
7	Extension contact	0.2296 ^{**}	
8	Sources of information	0.2286 ^{**}	
9	Awareness of Soil Health Card	0.2714 ^{**}	
10	Scientific orientation	0.4023 ^{**}	

* Significant at 0.05 level of probability & significant at 0.05 level (for 'z' value)

** Significant at 0.01 level of probability

ns - non-significant

The data presented in table 6 indicate the correlation coefficient between age, education, caste, family type, land area under wheat crop, annual income, extension contact, source of information, awareness of soil health card, and scientific orientation with extent of adoption of soil health card and calculate the value of differences production level of wheat among the wheat growers before and after of soil health card possession.

Age: The correlation coefficient "r" between age and extent of adoption of soil health card was found to be $r = 0.0196$, which was non-significant. Thus, it can be concluded that age does not have any effect on the extent of adoption of soil health card.

Education: The correlation coefficient "r" between education and extent of adoption of soil health card was found to be $r = 0.1841$, which is positive and significant at 5 percent level of probability. Thus, it can be concluded that the education was positively and significantly related with extent of adoption of soil health card.

Caste: The correlation coefficient "r" between caste and extent of adoption of soil health card was found to be $r = 0.2325$, which is positive and significant at 1 percent level of probability. Thus, it can be concluded that the caste was positively and significantly related with extent of adoption of soil health card.

Family type: The correlation coefficient "r" between family type and extent of adoption of soil health card was found to be $r = 0.0713$, which was non-significant. Thus, it can be

concluded that family type does not have any effect on the extent of adoption of soil health card.

Land area under wheat crop: The correlation coefficient "r" between land area under wheat crop and extent of adoption of soil health card was found to be $r = 0.1939$, which is positive and significant at 5 percent level of probability. Thus, it can be concluded that the land area under wheat crop was positively and significantly related with extent of adoption of soil health card.

Annual income: The correlation coefficient "r" between annual income and extent of adoption of soil health card was found to be $r = 0.2183$, which is positive and significant at 5 percent level of probability. Thus, it can be concluded that the annual income was positively and significantly related with extent of adoption of soil health card.

Extension contact: The correlation coefficient "r" between extension contact and extent of adoption of soil health card was found to be $r = 0.2296$, which is positive and significant at 1 percent level of probability. Thus, it can be concluded that the extension contact was positively and significantly related with extent of adoption of soil health card.

Sources of information: The correlation coefficient "r" between source of information and extent of adoption of soil health card was found to be $r = 0.2286$, which is positive and significant at 1 percent level of probability. Thus, it can be concluded that the sources of information was positively and significantly related with extent of adoption of soil health card.

Awareness of soil health card: The correlation coefficient “r” between awareness of soil health card and extent of adoption of soil health card was found to be $r = 0.2286$, which is positive and significant at 1 percent level of probability. Thus, it can be concluded that the awareness of soil health card was positively and significantly related with extent of adoption of soil health card.

Scientific orientation: The correlation coefficient “r” between scientific orientation and extent of adoption of soil health card was found to be $r = 0.4023$, which is positive and significant at 1 percent level of probability. Thus, it can be concluded that the scientific orientation was positively and significantly related with extent of adoption of soil health card.

Z value of production level of wheat before and after of soil health card possession: The “z” value of the production level is 1.7751, which is positively and significant at 5 percent level of probability. Thus, it can be concluded that the differences in production of wheat among the wheat growers before and after possession of soil health card is positive and significant.

4. DISCUSSION

The instant research was conducted to ascertain the impact of Soil health card (SHC) adoption on wheat growers. As evident from the results 65 per cent of the wheat growers had medium adoption of soil health card followed by 20 per cent of them who had low adoption of soil health card, this finding finds support with the findings of Dwivedi et al 2016, Sahu 2023 and Shrivastava et al 2009. It is these 20 per cent of the farmers who are a matter of concern for extension workers because even after Soil health card scheme being launched in 2015 and the wide publicity it continues to receive from various officials even today a considerable number of them still need to be converted into adopters of SHC scheme of the Government and contribute in sustainability of precious soil fertility as observed by Tripathi and Shrivastava 2017. The above investigation also obtained the production of wheat before and after adoption of SHC on the basis of recall data from the respondents. As regards the number of respondents categorised according to wheat production there is very minor apparent difference in the frequency of respondents falling under each category of low, medium and high production of wheat before and after adoption of SHC. But only this aspect of the data may be misleading as the limits of

production for different categories of low, medium and high adoption is not the same and it can be noted that the production limit is at a far higher level in post adoption wheat production in comparison to pre adoption wheat production. The same is confirmed by the results of Z test which shows that there is positive and significant difference between production of wheat before and after adoption of Soil Health Card.

From the correlation analysis it can be inferred that two variables namely age and family type had no significant relationship with adoption of SHC. Non significant relationship denotes that any variation in these two variables will not have any effect on the adoption of SHC. The other three variables viz education, land area under wheat crop and annual income have positive and significant relationship with adoption of SHC. This means that if there is any increase or decrease in education, land area under wheat crop and annual income there would be a simultaneous increase or decrease in adoption of SHC. Significance at 5 per cent level of probability means that if the same survey is carried out under the same set of conditions then there is 95 per cent chance/ probability that we will get same results and there would be only 5 per cent probability that the results will be different ie there would be 95 percent chance that the variables education, land area under wheat crop and annual income would be positively and significantly related with adoption of SHC. Similarly, the remaining five variables viz caste, extension contact, sources of information, awareness of soil health card and scientific orientation had positive and highly significant relationship with adoption of Soil health card, these results find support from Kumar et al 2023. A higher number of respondents exhibited medium level of awareness regarding Soil Health Card (49.16%) was observed by -Yogesh et al (2021) in their study. Shastri and Saha (2025) in their research found that 95.83 per cent of farmers had a medium to high level of perception regarding the usefulness of SHC. This positive perception can be attributed to their educational background (secondary level and above), moderate exposure to mass media, and a medium level of scientific orientation.

5. CONCLUSION

Thus, we may conclude that if the value of variables like education, land area under wheat crop, annual income, caste, extension contact, sources of information, awareness of soil health

card and scientific orientation increase than the degree of adoption of Soil Health Card will also increase. However, the change in variables age and family type will have no effect on adoption of Soil Health Card by wheat growers. It may also be concluded from the study that around 80 percent of the wheat growers have medium to high adoption of Soil Health Card.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

- Bisarya, S. S., Shukla, A., & Besen, M. (2023). An overview of Soil Health Card scheme. *International Journal of Current Science*, 13(2), 295–299.
- Chowdary, R. K., Jayalakshmi, M., & Prasadbabu, G. (2018). Factors determining the soil health card adoption behaviour among farmers in Andhra Pradesh. *An Asian Journal of Soil Science*, 13(1), 83–86.
- Dwivedi, R., Shrivastava, K. K., & Shrivastava, Prashant. (2016). Adoption of lac production technology in Baster district of Chattisgarh. *Asian Journal of Extension Education*, 34, 05–07.
- <https://www.sciencedirect.com/science/article/abs/pii/S0167198718311152> (accessed on 01/07/2025).
- Kapoor, R., Sharma, A., Raina, R., & Thakur, K. S. (2021). Assessment of soil fertility status of different villages of Chamba district of Himachal Himalayas. *Indian Journal of Extension Education*, 57(1), 196–201.
- Kumar, A., Singh, S., Singh, D. K., Yadav, R. N., Singh, L. B., Malik, S., & Shahi, U. P. (2021). To study the socio-economic profile of soil health card scheme beneficiaries. *Progressive Agriculture*, 21(2), 211–215.
- Kumar, S., Verma, A., Sinha, S., & Shrivastava, P. (2023). Factors influencing scientific orientation of sugarcane farmers. *International Journal of Agricultural Sciences*, 19(2), 744–747.
- Kumari, K., Kumar, K. P., Kinnera, D., Anwesh, M., Dager, S. R., & Dwivedi, A. P. (2022). Soil health card: A review. *The Pharma Innovation Journal*, 11(5S), 1092–109.
- Patel, M. K., Shrivastava, K. K., Shrivastava, P., & Sarkar, J. D. (2009). Constraints Analysis in Adoption of Recommended Soybean Production Technology. *J.Interacad.*, 13(2), 224–231.
- Rani, S., Dahiya, M., & Yadav, B. (2024). Sustainable farming practices: Soil Health Cards as a tool. In *International Journal of Environmental & Agriculture Research*, 10(9), 53–57.
- Reddy, A. Amarender. (2017). Impact Study of Soil Health Card Scheme. National Institute of Agricultural Extension Management (MANAGE), Hyderabad-500030, Pp. 210.
- Reddy, A. Amarender. (2019). The Soil Health Card Scheme in India: Lessons Learned and Challenges for Replication in Other Developing Countries. *Journal of Natural Resources Policy Research*, 9(2), 124–154.
- Sahu, V. P. (2023). Impact of Soil Health Card on adoption and production among the wheat growers in Jabalpur district of Madhya Pradesh (Unpublished MSc (Ag) thesis). Jawaharlal Nehru Krishi Vishwa Vidyalaya (JNKVV), Jabalpur, Madhya Pradesh.
- Shastri, S., & Saha, A. (2025). Farmers' perception of the Soil Health Card Scheme in Bilaspur, Chhattisgarh, India. *Journal of Experimental Agriculture International*, 47(2), 152–158.
- Shrivastava, R., Shrivastava, K. K., Shrivastava, P., & Sarkar, J. D. (2009). Impact of Socio-Economic traits on adoption of disease control measures in rice. *J. Soils and Crops*, 19(2), 214–218.
- Singh, B. P., Kumar, V., Chander, M., Reddy, M. B., Shruti, Singh, M., Suman, R. S., & Yadav, V. (2023). Impact of Soil Health Card Scheme on soil fertility and crop production among the adopted farmers. *Indian Journal of Extension Education*, 59(1), 122–126.
- Singh, J., Negi, A., & Rohit. (2020). Soil Health Card: An overview (Chapter 4). In *Current Research in Soil Science* (pp. 43–58). Aiknik Publication, New Delhi.
- Tripathi, A. K., & Shrivastava, P. (2017). Yield advantage through integrated crop management technologies in Green Gram

- at Chhattarpur district of Madhya Pradesh. *Annals of Agriculture Research*, 38(1), 01–05.
- Verma, A., & Shrivastava, P. (2021). Scope and challenges of entrepreneurship in agriculture in India. *International Journal of Education, Modern Management, Applied Science & Social Science*, 3(2)(III), 75–79.
- Viswam, M. D. (2017). Soil Health Card: Empowering farmers to improve soil health for enhancing agriculture productivity. *informatics.nic.in*, July, 25–28.
- Yogesh, B, Kinjulck C. Singh, Chandrajit Singh, Rachit Chouksey, & Akhilesh Patel. (2021). Extent of Awareness of Farmers Regarding Soil Health Card in Rewa block of Rewa District (M.P.). *Indian Res. J. Ext. Edu.*, 21(1), 55–58.

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