**Farmers Perception of the Soil Health Card Scheme in Bilaspur, Chhattisgarh, India**

# ABSTRACT

The Soil Health Card (SHC) is a government initiative that provides farmers with soil nutrient information to guide the use of fertilizers and improve soil health. The perception of farmers plays a crucial role in the effective implementation of agricultural schemes. The study was conducted in Bilaspur district, Chhattisgarh, where the Deputy Director of Agriculture implemented the SHC scheme in the Bilha, Kota, Masturi, and Takhatpur blocks during its initial and second phases. These blocks were selected purposively, and villages within them were chosen randomly. A list of SHC beneficiary farmers was compiled, and 30 farmers from each block were randomly selected, totaling 120 participants. Data collection was done through personal interviews using a pre-structured schedule to assess farmers' perceptions of the SHC's utility. The study examined both independent and dependent variables, with data analysis techniques such as descriptive statistics and inferential methods used to explore the factors influencing farmers' perceptions, including education, exposure to mass media, and scientific orientation. The results indicated that 95.83% 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. The study highlights that awareness, access to information, and a scientific approach significantly influence farmers' perception of the SHC scheme, emphasizing the need for continued efforts in knowledge dissemination and training to enhance its impact.

Keywords: farmer’s perception, soil health card, awareness, scientific approach,

# INTRODUCTION

Agriculture remains the primary source of livelihood for approximately 58% of India's population. In FY 2019-20, the Gross Value Added (GVA) by agriculture, forestry, and fishing was estimated at ₹19.48 lakh crore (US$276.37 billion), with a sectoral growth rate of 4% (India Brand Equity Foundation, 2020). India has the second-largest arable land area globally, covering

141.4 million hectares, second only to the United States. However, with a growing population, the demand for higher food production continues to exert immense pressure on soil resources. Projections indicate that per capita land availability, currently at 0.15 hectares, is expected to decline to 0.10 hectares by 2025 (World Watch Institute). If the current agricultural growth trends persist, India may need to import 45 million metric tons of food grains by 2025.

Soil health is a critical determinant of sustainable agricultural productivity. Recognizing the importance of soil fertility management, the Government of India launched the Soil Health Card (SHC) Scheme on February 19, 2015, in Suratgarh, Rajasthan. The scheme aims to promote soil test-based fertilizer application by providing farmers with detailed information on the nutrient status of their soil, along with tailored recommendations for appropriate nutrient application. To commemorate this initiative, Soil Health Card Day is observed annually on February 19. According to the National Productivity Council (NPC), the SHC scheme has led to an 8-10% reduction in chemical fertilizer usage and a 5-6% increase in agricultural productivity.

A Soil Health Card serves as a valuable tool for farmers, offering insights into soil nutrient levels and guiding them on the optimal use of fertilizers, micronutrients, and soil amendments necessary for long-term soil health maintenance. While significant efforts have been made by both central and state governments to assess and improve soil health through this scheme, the extent to which farmers perceive its benefits remains a crucial aspect.

Given the importance of soil health in sustainable agriculture, this study aims to evaluate farmers' perceptions of the SHC scheme in Bilaspur, Chhattisgarh. The research seeks to understand the level of awareness and utility of SHCs among farmers, along with identifying the challenges they face in adopting the recommendations provided by the scheme. Recognizing the significance of the Soil Health Card as an essential tool for effective nutrient management, a farmer's decision to adopt new agricultural technologies is largely influenced by their perception.

This perception plays a crucial role in determining the extent to which they embrace innovative farming practices. The current study aims to examine the profile characteristics of farmers, their perception of Soil Health Card recommendations, and the correlation between these factors.

# OBJECTIVES OF THE STUDY

1. To study the socio-economic, socio-personal and socio communicational profile of the respondents
2. To know the level of perception of farmers regarding utility of soil health card
3. To emphasize the need for continued efforts to enhance the impact of SHC.

# METHODOLOGY

The study was conducted in Bilaspur district, Chhattisgarh, where the Deputy Director of Agriculture, Bilaspur, implemented the Soil Health Card (SHC) scheme in Bilha, Kota, Masturi, and Takhatpur blocks during the intial and second phases. These blocks were selected purposively, while villages within them were chosen randomly.

A list of SHC beneficiary farmers engaged in SHC activities was obtained, and 30 farmers from each block were randomly selected, forming a total sample of 120 farmers. Data collection was carried out through personal interviews using a pre-structured schedule to assess farmers' perception levels regarding SHC utility. The study incorporated independent and dependent variables for detailed investigation.

# RESULT AND DISCUSSION

**Table 1: Socio-economic, socio-personal and socio communicational profile of the respondents**

(n=120)

|  |  |  |  |
| --- | --- | --- | --- |
| **S. no.** | **Categories** | **Frequency** | **Percentage** |
| **1. Age** |
| a. . | Young age group (upto 37 years) | 35 | 29.16 |
| b. . | Middle age group (37-58 years) | 81 | 67.51 |
| c. | Old age group (above 58years) | 4 | 3.33 |

|  |
| --- |
| **Level of education** |
| a. | Illiterate | 27 | 22.51 |
| b. | Primary | 7 | 30.33 |
| c. | Secondary education | 46 | 38.33 |
| d. | Higher secondary or graduate | 10 | 8.33 |
| **Level of mass media exposure** |
| a. | Low level | 20 | 16.66 |
| b. | Medium level | 81 | 67.5 |
| c. | High level | 19 | 15.8 |
| **Level of source of income** |
| a. | Low level of income | 18 | 15 |
| b. | Medium level of income | 84 | 70 |
| c. | High level of income | 18 | 15 |
| **Level of social participation (mean= 21.87, S.D.= 2.35)** |
| a. | No membership | 20 | 16.66 |
| b. | Membership in one organization | 78 | 65.01 |
| c. | Membership in more than oneorganization | 22 | 18.33 |
| **Size of land holding** |
| a. | Small size of land holding (up to 2.00acres) | 22 | 18.33 |
| b. | Medium size of land holding (2.1 to5.00 acres) | 92 | 76.66 |
| c. | Large size of land holding ( above 5.00acres) | 06 | 5.01 |
| **Level of annual income** |
| a. | Low annual income | 30 | 25.01 |
| b. | Medium annual income | 83 | 69.16 |
| c. | High annual income | 07 | 5.83 |
| **Level of scientific orientation** |

|  |  |  |  |
| --- | --- | --- | --- |
| a. | Low level of scientific orientation | 17 | 14.16 |
| b. | Medium level of scientific orientation | 92 | 76.66 |
| c. | High level of scientific orientation | 11 | 9.16 |
| **Level of risk orientation (mean= 14.76, S.D.= 1.73)** |
| a. | Low level of risk orientation | 24 | 20 |
| b. | Medium level of risk orientation | 81 | 67.5 |
| c. | High level of risk orientation | 15 | 12.5 |
| **Level of farming experience** |
| a. | Low level of farming experience | 5 | 4.16 |
| b. | Medium level of farming experience | 86 | 71.66 |
| c. | High level of farming experience | 29 | 24.16 |
| **Level of innovativeness (mean= 16.34, S.D.= 1.66)** |
| a. | Low level of innovativeness | 15 | 12.5 |
| b. | Medium level of innovativeness | 105 | 87.5 |
| c. | High level of innovativeness | 00 | 0.00 |
| **Occupation** |
| a. | Farming | 59 | 42.5 |
| b. | Farming + animal husbandry | 31 | 32.5 |
| c. | Farming + business | 25 | 20.83 |
| d. | Farming + animal husbandry + business | 5 | 4.16 |

The data reveals that a majority (67.51%) of Soil Health Card (SHC) holders belong to the middle age group, followed by 29.16% in the young age group and 3.33% in the old age group. These results are consistent with the findings of N.K. Mishra (2020) . This could be attributed to the migration of young individuals seeking other employment opportunities. In terms of education, 38.33% had completed secondary-level education, 30.83% had primary-level education, 22.51% were illiterate, and 8.33% had attained higher education or graduation. Notably, 77.49% had education above the primary level, suggesting that rural education facilities and awareness about the significance of education have contributed to their overall development. These findings align with studies conducted by Bhosale (2010) and Ghintala & Singh (2013). Regarding mass media exposure, 67.5% had

a medium level of exposure, while 16.66% and 15.83% had low and high levels, respectively. Similarly, 70% utilized a medium level of information sources, followed by 15% each in the low and high categories. Membership in organizations varied, with 65.01% belonging to one organization, 18.33% involved in multiple organizations, and 16.66% having no organizational membership. Landholding patterns indicated that 76.66% had medium-sized landholdings, while 18.33% and 5% fell into small and large landholding categories, respectively. Income distribution showed that 69.16% had a high annual income, whereas 25.01% and 5.83% had low and medium incomes, respectively.

Scientific orientation among SHC holders was predominantly at a medium level (76.66%), with 14.16% having low and 9.16% having high scientific orientation. Risk orientation varied, with 67.5% having a medium level, 20% a low level, and 12.5% a high level. Farming experience was mainly at a medium level (71.66%), with 24.16% having high and 4.16% having low farming experience. Innovativeness was also observed at a medium level in 87.5% of the SHC holders, while 12.5% exhibited a low level, and no respondents had a high level of innovativeness. Occupational engagement indicated that 42.5% were solely involved in farming, whereas 32.5% combined farming with animal husbandry, and 20.83% combined farming with business. Only 4.16% engaged in farming alongside both animal husbandry and business activities.

**Perception of SHC holders about soil health card**

Perception is the process of understanding and interpreting a situation or concept. This study focused on farmers' perceptions of the Soil Health Card (SHC). Respondents were presented with various statements related to SHC and asked to express agreement or disagreement. Their responses were analyzed using appropriate scoring techniques, and the findings are presented in table 2 and figure 1

**Table 2: Distribution of the SHC holders according to their level of perception (n=120) (mean = 95.65, S.D. = 0.11)**

|  |  |  |  |
| --- | --- | --- | --- |
| **S.****no.** | **Categories** | **Frequency** | **Percentage** |

|  |  |  |  |
| --- | --- | --- | --- |
| 1. | low level of perception | 15 | 12.5 |
| 2. | Medium level of perception | 100 | 83.33 |
| 3. | High level of perception | 05 | 4.16 |
| **Total** | **120** | **100** |

****

**Figure1: Distribution of SHC holders according to their level of perception**

The data in indicates that most SHC holders (83.33%) had a medium level of perception, while 12.5% had a high level and 4.16% had a low level of perception. Overall, 95.83% of respondents exhibited a medium to high understanding of the Soil Health Card. This could be attributed to their education beyond the secondary level, moderate exposure to mass media, and a medium level of scientific orientation. Similar results were reported by Kadam et al. (2012), though they contrast with the findings of Chauhan (2015) and Sonawane et al (2015).

**Correlation between Farmers' Perception of SHC holders and Independent Variables**

A Pearson’s correlation analysis was conducted to assess the relationships between the perceptions of Soil Health Card (SHC) beneficiaries and various independent variables. Among the twelve factors examined, nine displayed significant correlations at the 0.01 level, highlighting important insights into the factors influencing beneficiaries' perceptions. Specifically, age and annual income showed a negative correlation with perception, with age

having a correlation of r = -0.524 and annual income at r = -0.496. This suggests that as age and annual income increase, the perception of SHC recommendations tends to decrease, which may be due to older farmers or those with higher incomes being less inclined to adopt new practices or change their existing farming methods.

On the other hand, a positive correlation was found between perception and several factors. Education had a moderate positive correlation (r = 0.347), indicating that individuals with higher educational levels tend to have a more favorable perception of the SHC. Similarly, farming experience (r = 0.623) strongly correlated positively with perception, suggesting that experienced farmers are more likely to appreciate and utilize the SHC recommendations. The use of information sources (r = 0.392) also showed a positive association, as did social participation (r = 0.360), which implies that farmers who are actively engaged in community or agricultural groups tend to have better perceptions of the SHC.

Furthermore, scientific orientation (r = 0.611) and risk orientation (r = 0.391) were both positively correlated with perception, indicating that farmers with a greater willingness to adopt scientific methods and those with a higher tolerance for risk are more likely to perceive the SHC as beneficial. Innovation promptness also showed a strong positive correlation (r = 0.611), reflecting that farmers who are more open to innovation tend to have a more favorable view of SHC recommendations. These findings are clearly illustrated in Table 3, which further emphasize the significance of these factors in shaping the perceptions of SHC beneficiaries.

**Table 3: Relationship between independent variables of SHC holders and their level of perception about Soil Health Card**.

|  |  |  |  |
| --- | --- | --- | --- |
| **S no.** | **Variables** | **„r‟****value** | **P – value** |
| 1 | Age | -.524\*\* | 0.000 |
| 2 | Education | .347\*\* | 0.000 |
| 3 | Mass media exposure | 0.122 | 0.186 |
| 4 | Land holding | -0.022 | 0.808 |
| 5 | Occupation | 0.086 | 0.351 |

|  |  |  |  |
| --- | --- | --- | --- |
| 6 | Annual income | -.496\*\* | 0.000 |
| 7 | Farm experience | .623\*\* | 0.000 |
| 8 | Information source | .392\*\* | 0.000 |
| 9 | Social participation | .360\*\* | 0.000 |
| 10 | Scientific orientation | .611\*\* | 0.000 |
| 11 | Risk orientation | .391\*\* | 0.000 |
| 12 | Innovationpromptness | .611\*\* | 0.000 |

**\*\*Correlation is significant at the 0.01 level (2- tailed)**

**\*Correlation is significant at the 0.05 level (2- tailed)**

# CONCLUSION

The study highlights that the perception of Soil Health Card (SHC) holders is influenced by various socio-economic and personal factors. Education, farming experience, access to information, social participation, scientific orientation, risk-taking ability, and openness to innovation positively contributes to their understanding and utilization of SHC. However, age and annual income have shown a negative but significant impact, indicating that younger and lower-income farmers might be more receptive to adopting SHC recommendations. On the other hand, landholding size and mass media exposure do not exhibit a significant relationship with perception levels.

While a majority of SHC holders demonstrate a medium level of awareness and usage, there is scope for improving their understanding of soil health management. Strengthening agricultural extension services, enhancing coordination between farmers and field officers, and upgrading soil testing infrastructure can further improve the effectiveness of SHC. Additionally, ensuring farmers’ active participation in soil testing and improving the quality of lab facilities will enhance trust and practical application. A targeted approach focusing on awareness campaigns, training programs, and incentives for adopting best practices can lead to better utilization of SHC and more sustainable agricultural practices.

# ACKNOWLEDGEMENTS

I sincerely express my gratitude to my co-author for their valuable contributions and support in writing this article. Their insights and collaboration have been instrumental in shaping the study. I also appreciate the guidance and encouragement received from colleagues and mentors.

# CONFLICT OF INTEREST

I declare that there is no conflict of interest among the researchers involved in this study

Disclaimer (Artificial intelligence)

Option 1:

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 the writing or editing of this manuscript.

Option 2:

Author(s) hereby declare that generative AI technologies such as Large Language Models, etc. have been used during the writing or editing of manuscripts. This explanation will include the name, version, model, and source of the generative AI technology and as well as all input prompts provided to the generative AI technology

Details of the AI usage are given below:

1.

2.

3.

# REFERENCES

Bhosale, U. S. (2010). Participation of rural youth in paddy farming in Anand district of Gujarat state. Unpublished M.Sc. (Agri.) thesis, A. A. U., Anand.

Chauhan, C. D. (2015). Perception and attitude of farmers towards low cost greenhouse technology in Navsari district of South Gujarat. Unpublished M.Sc. (Agri.) thesis, A. A. U., Anand.

Ghintala, A. and Singh, K. (2013). Knowledge and adoption of sprinkler irrigation system by the farmers of Banaskantha district of North Gujarat. *Ind. J. Extn. Edu. & R.D*. 21(1): 26-29.

Kadam, M. S.,Pandya, R. D., Kolgane, B. T. and Khogare, D. T. (2012). Personal profile of experts of KVKs and their role perception and role performance. *Int. J. Agri. Sci*.8 (2): 452- 459.

Mishra, N. K. (2020). Knowledge and attitude of farmers towards soil health card scheme in Tikamgarh District of Madhya Pradesh. *M. Sc.(Ag.)* Thesis. Jawaharlal Nehru Krishi Vishwa Vidyalaya Jabalpur, 482004.

Negaru, Partkh. The impact of perception and other factors on the adoption of agricultural technology in the moret and jiru woreda of Ethiopia. Agril Econ. 1999;21:205-216.

Patel, G. G., Y.C. Lakum, Aakash Mishra and Bhatt, J.H. 2017. Awareness and knowledge regarding Soil Testing and utility perception of Soil Health Card. Int.J.Curr.Microbiol.App.Sci. 6(10): 329-334.

Sonawane, H. P., Jadhav, S. S. and Neware, S. S. (2015). Farmers‟ perception towards crop insurance scheme in Maharashtra. *Guj. J. Extn. Edu*. 26 (2): 141-143.

Sunaina, Babita Kumar, Gagandeep B. An empirical investigation of farmers perception and attitude towards soil health testing in Punjab. J of Agricultural Dev. and Pol. 2018;28(1):81-91.