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A Success story, a policy development reports related to policy planning and research in India to farmers' perception and adoption of Soil Health Cards for better nutrients and water management in field crops in Motigarpur & Kadipur blocks of Sultanpur district of U.P, India

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Abstract

The present study was conducted with an objective to study the farmers' perception and adoption of Soil Health Card (SHC) in Sultanpur district. A total of 120 respondents including 90 farmers and 30 extension workers were selected for the study. The results revealed that majority of the respondents were in 36 – 54 years age group with primary school education and farming as a sole occupation, with more than 30 years of experience in farming, land holding of 1-5 acres, annual income was between 1 lakh to 2 lakh, neighbors, friends, AEO/AO as major sources of information, nuclear type of family with family size up to 5 members, having occasional information seeking behaviour, had no membership in any organization and majority of them used complex fertilizers followed by straight. It is evident from the study that Majority of the farmers had medium (56.67 %) level of perception followed by high (28.89 %) and low (14.44 %) level perception. Whereas, in case of adoption of soil Health card results, majority of the farmers had low (45.56 %) level of adoption followed by medium (36.67 %) and high level of adoption (17.78 %). respectively.

Keywords: Soil health card, farmers, perception, adoption level, nutrient management, extension services

Introduction

Soil is a perpetual property for the human being to live as it provides food, bank of nutrients for plant growth, acts as a natural filter for water, and supports an enormous amount of biodiversity. Soil degradation in India is estimated to be occurring on 147 million hectares (Mha) of land, including 94 Mha from water erosion, 16 Mha from acidification, 14 Mha from flooding, 9 Mha from wind erosion, 6 Mha from salinity, and 7 Mha from a combination of factors. (Bhattacharyya, R., 2015) [2]. Soil is becoming unproductive due to unnecessary use of chemical fertlizers. Huge amounts of fertlizers are being dumped in the soil every day in order to get higher yields. Indiscriminate use of fertilizers negatively impacts soil by causing degradation, pollution, and a loss of fertility. Fertilizer consumption in india was just 60.64 lakh tonnes during 1981-81, where as in 2019-20, it was 293.69 and in the last year it was 329.28 lakh tonnes. The state of Andhra Pradesh uses the most fertilizers at the rate of 1.7 top 1.8 Millon tonnes annually, and within the state, Guntur district records the highest fertilizer consumption (DoA&FW, 2024). Urbanization today is reducing the availability of agricultural land. At the same time, the overuse of chemical fertilizers is making soil less fertile and lowering crop productivity. Together, these problems threaten our ability to produce enough food, making food security a game-changing challenge for future generations. To keep the soil away from the indiscriminate use of fertilizers, Govt of india initiated Soil Health card (SHC) scheme in 2015 and celebrated world soil day on 5th December every year. As a result of the scheme, a total of 1,43,82,937 Soil Health Cards were issued to farmers across the country from its inception until 2019. With this background, the present study was undertaken to assess the perception of the farmers towards Soil Health Cards (SHC) in Motigarpur & Kadipur blocks of Sultanpur district of U.P., India.

Material and Methods

A Structured Interview schedule was developed to collect the data from the farmers of during the year 2019-20. Ex-post facto research design was employed. Out of 57 Mandals in the districts, 3 mandals and from each mandal 2 villages were selected. A total of 90 farmers at the rate 15 farmers from each village were selected randomly. Perception of farmers on SHC was studied with three-point continuum i.e Agree, undecided and disagree with scores 3 for agree 2 for undecided and 1 for disagree. Further, Adoption of SHC results among farmers was also studied as similar score pattern to perception. Descriptive statics *viz*., frequency and percentage were used to analyse and interpret the data. Accordingly, conclusions were drawn.

Results and Discussion

Table 1: Profile characteristics of the farmers n=90

Sl.No	Profile characteristics	Category	Frequency	Percentage
1	Age	Young (> 18 to 35 years)	27	30.00
		Middle (> 36 to 54 years)	41	45.56
		Old (>54 years)	22	24.44
2	Education	Illiterate	17	18.89
		Primary school	36	40.00
		Secondary school	14	15.56
		Intermediate	14	15.56
		Under graduation and above	9	10.00
3	Occupation	Farming	67	74.44
		Farming + Animal husbandry	12	13.33
		Farming + business	7	7.78
		Farming + other's	4	4.44
4	Farming experience	Low (< 15 years)	13	14.44
		Medium (15-30years)	32	35.56
		High (>30 years)	45	50.00
5	Landholding Size	less than 2.5 acres	35	38.89
		2.5 to 5 acres	28	31.11
		5 to 7.5 acres	17	18.89
		above 7.5 acres	10	11.11
6	Type of Family	Nuclear Family	86	95.56
		Joint Family	4	4.44
7	Annual income	Low (<1 lakh)	38	42.22
		Medium (1 to 2 lakh)	41	45.56
		High (> 2 lakh)	11	12.22
8	Information source	AO/AEO	21	23.33
		Scientist	3	3.33
		Friend	29	32.22
		Neighbour	37	41.11
9	Social Participation	Member of organizations	81	90.00
		Not a member of any organization	9	10.00
10	Information seeking behaviour	Frequently	5	5.56
		Occasionally	64	71.11
		Rarely	21	23.33
12	Type of fertilizer used	Straight	6	6.67
		Complex	84	93.33

It was observed from the table 1. That more than half of the respondents 45.56 per cent were found to be middle-aged followed by young (30.00) and old aged (24.44). data from the table 1. expressed that majority (38.89 %) of the farmers were marginal farmers with land holding of less than 2.5 acres followed by small farmers (31.11%) with land holding of 2.5 to 5 acres, and medium (18.89%) farmers with 5 to 7.5 acres and only 11.11per cent of farmers were large farmers with above 7.5 acres.

literacy level among farmers was depicted in Table 1. The farmers were grouped into 5 categories: illiterate, farmers with primary school education, secondary-school education, intermediate education, and under graduation and above. It is observed that majority (40.00%) of farmers went to primary school followed by illiterates (18.89 %). Whereas, equal number (15.56 %) of farmers had secondary and intermediate education followed by Under graduation and above (10.00%) education category were found among the respondents.

Table 1. also represents the occupation of farmers. Accordingly, majority (74.44 %) of the farmers were involved in only farming followed by farming + Animal husbandry (13.33 %), farming + business (7.78%) and farming + others (4.44%). Moreover majority (50.00%) of farmers had high level experience followed by medium (35.56 %) and low level (14.44 %) of experience.

Majority (95.56%) of the farmers were having nuclear families whereas, only 4.44 per cent of them were having Joint Families. It was clear from Table 1. that majority (45.56%) of farmers had 1 to 2 lakhs of annual income followed by annual income with 1 lakh (42.22 %) and only 12.22 farmers had more than 2 lakhs of annual income.

Information source is the significant channel, on which entire cultivation depends. Study found that majority (41.11%) of farmers depended on neighbors followed by friends (32.22) for the farm information. Whereas, 23.33 per cent of farmers depended on AO & AEOs and only few (3.33 %) farmers depended on scientist for the farm information.

It was also informed that majority (71.11 %) of the farmers contacted for farm information occasionally followed by rarely (23.33 %) and only few (5.567) were contacting Frequently for farm information. Further, majority (90.00 %) of the farmers had no membership in social organizations whereas, only 10.00 per cent of them had membership in social organizations. Sivanarayana & Lalitha, 2019 [5] and babu et.al, 2022 [1] on SHC. Finally,

study found that 93.33 per cent of the farmers were using complex fertilizers whereas, less (6.67 %) of them were using straight fertilizers to cultivate the crops. The results in line with the study conducted by of.

Table 2: Perception of the farmers about soil Health card n=90

Sl.N	Statements	Agree	Undecided	Disagree
1	The results given in the soil test report are appropriate	11 (12.22)	51 (56.67)	7 (7.78)
2	Higher yields can be obtained through the results given in the soil test report	24 (26.67)	72 (80.00)	15 (16.67)
3	Cost of incurring on fertilizers can be reduced by using the results given in the soil test report	62 (68.89)	17 (18.89)	11 (12.22)
4	The soil test report helps in selecting suitable crops for the soil	54 (60.00)	22 (24.44)	14 (15.56)
5	The information given in the soil test report helps in maintaining soil fertility	58 (64.44)	21 (23.33)	11(12.22)
6	Nutrient management can be done through the soil test report	39 (43.33)	32 (35.56)	19 (21.11)
7	Reclamation of problematic soils can be done through the soil test report	42 (46.67)	31 (34.44)	17 (18.89)

Figures in parentheses indicate percentages

Majority of the farmers fall under undecided category with respect to perception against possibility of higher yields (80.00 %), soil test results (56.67 %), whereas, farmers agreed with possibility of cost incurring on fertilizers (68.89 %) maintaining soil fertility (64.44 %), selection of suitable crops (60.00 %), reclamation of problematic soils (46.67 %) and nutrient management (43.33) based on the SHC result. Babu et.al, 2022 [1] in their study reported that 46 per cent of the respondents were 'undecided' to the statement that the results given in SHC are reliable followed by 'agree' (35.00 %) and 'disagree' (19.00 %). Veeraiah *et al*., 2022, reported that with regard to diagnosis and reclamation of problematic soils with SHC, greater part of the respondents i.e., 54.69 per cent and 51.57 per cent agree with the same respectively but 21.88 per cent and 15.62 per cent remain undecided and 23.43 per cent and 32.81 per cent disagree with the statements respectively. Babu et.al also expressed that majority (46.00 %) of the farmers fall under undecided category about the results given in SHC

Table 3: Adoption of the SHC results by the farmers n=90

S. No	Statements	Adopted	Partially adopted	Not-adopted
1	Crops grown based on the SHC	52 (57.78)	0 (0. 00)_	38 (42.22)
2	Applied organic manures based on SHC *viz.,* FYM, compost and green leaf manure	17 (18.89)	26 (28.89)	47 (52.22)
3	Followed the macro nutrients application as per the SHC *viz.,* N, P &K	16 (17.78)	23 (25.56)	51 (56.67)
4	Followed the Micro nutrients application as per the SHC *viz.,* Zn, Fe, B, Ca, Mn	31 (34.44)	21 (23.33)	38 (42.22)
5	Reclaimed problematic soils based on soil test results	10 (11.11)	36 (40.00)	44 (48.89)

Figures in parentheses indicate percentages

Based on the findings depicted in Table 3. that, except cultivation of the crops (57.78%), majority of the farmers had not adopted soil test results against application of macro nutrients *viz.,* N, P &K (56.67 %) reclamation of problematic soils (48.89 %), application of micro nutrients *viz.,* Zn, Fe, B, Ca, Mn (42.22 %) and organic manure applications (52.22 %). Application of nutrients as per the soil test report not only reduce the cost of cultivation but also improves the soil fertility which in turn sustain the productivity of the crops. As more than 80 per cent of the land is cultivated by tenant farmers, they concentrate more on yield than the fertility status of soil. Due to this reason, most of the sample farmers have not adopted the SHC results as exemplified in the table 3. Madhuri et.al reported in her study that 44.44 per cent of the farmers have not adopted the recommended dose of zypsum as per the SHC

Table 4: Overall Perception and adoption of the SHC results n= 90

Sl.No	Category	Low	Medium	High
1	Perception	13 (14.44)	51 (56.67)	26 (28.89)
2	Adoption	41 (45.56)	33 (36.67)	16 (17.78)

Figures in parentheses indicate percentages

Overall Perception and adoption of the SHC results in table 4. that, majority of the farmers had medium (56.67 %) level of perception followed by high (28.89 %) and low (14.44 %) level perception. Whereas, in case of adoption of soil Health card results, majority of the farmers had low (45.56 %) level of adoption followed by medium (36.67 %) and high level of adoption (17.78 %). Though perception on SHC was medium to high among farmers but the adoption of the SHC results was low to medium among the farmers. This indicates that farmers who had followed soil test cards recommendations without any deviation were found lesses in application of most of the nutrients. Shastri and Anindita reported that the results indicated that 95.83 per cent of farmers had a medium to high level of perception regarding the usefulness of SHC, whereas, Shivpal Singh et.al reported that majority of soil health card users (83.66 %) had a favorable attitude toward the card, followed by a less favorable attitude (11.97 %), while just 4.27% of respondents had the most favorable view. Babu et.al, 2022 [1] observed that half of the respondents (54 %) had medium level of perception followed by high level of perception (28.5 %) and low level of perception observed is 17.5 per cent.

World Soil Day was celebrated by Krishi Vigyan Kendra Kushinagar-Success story

Krishi Vigyan Kendra (ICAR-Indian Institute of Vegetable Research, Varanasi) Sargatia, Seorahi, Kushinagar organized World Soil Day on the 5th of December, 2018.

The programme organized with the aim to Make the Farmer's aware about the importance of soil health and it's necessity for sustainable production was inaugurated by the Shri Ganga Singh Kushwaha, Hon'able MLA Fazilnagar (BJP), Dr. Babu Ram Murya, Soil Conservation Officer, Kushinagar, Dr. A.K. Mishra, Scientist, Genda Singh Sugarcane Breeding & Research Institute, Kushinagar and various dignitaries, media persons and farmers of the district.

In his inaugural address he describing that it is difficult to get enough production from our field without concerning the health of our soil. Excess use of chemical fertilizer negatively affects soil health. Therefore, to maintain our soil health it is important to have soil health Card through which we can know our soil requirement and feed accordingly. Shri Ganga Singh Kushwaha distributed Soil Health Cards among farmers and requested to follow the recommendation given in soil health card

The inaugural session was followed by the ICAR song and the welcome address by Dr. Vikash Singh, In-charge, Kvk&RRS, Sargatia, the programme was hosted by Mrs.Anjali Sahu, SMS (H.Sci.) Krishi Vigyan Kendra, Kushinagar. The guests were welcomed by Dr. Ashok Rai SMS (Agril. Extn), Krishi Vigyan Kendra, Kushinagar.Vote of thanks was given by Shri Yogesh Yadav, SMS(Animal Science),Krishi Vigyan Kendra, Kushinagar

During the technical session Dr.T.N. Rai, SMS (Soil Sci.) focused on the method of soil sampling and use of fertilizer according to soil test report. Dr. Shamsher Singh, SMS (Horticulture) focused on organic farming and also emphasized the significance of the vegetable intercropping for more income per unit area. Shri Ajay Kumar Rai, SMS (Plant Protection) given information on the bio-control of insect-pest. Dr. A.K. Mishra, Scientist, Genda Singh Sugarcane Breeding & Research Institute, Kushinagar & Dr. BabuRam Murya, Soil Conservation Officer, Kushinagar, highlighted the role of soil health for production. During the event Technical Information related to crop production and soil health was given and Two hundred Fifty Soil Health Cards were distributed among farmers.

Glimpses of Event World Soil Day

Distribution of soil Health Card by M.L.A., Fazilnagar, Kushinagar-2018

Dr. T.N. Rai, SMS Soil Sci. addressing the farmers-2018

विश्व मृदा दिवस पर विशेषज्ञों ने दी वैज्ञानिक जानकारी

किसानों को वितरित किए मृदा स्वास्थ्य कार्ड

मुकेश सिंह पत्रकार संडीला **हरदोई** भारतीय कृषि अनुसंधान परिषद, केंद्रीय मृदा लवणता अनुसंधान संस्थान द्वारा संचालित कृषि विज्ञान केंद्र हरदोई-II में शुक्रवार को विश्व मृदा दिवस उत्साहपूर्वक मनाया गया। कार्यक्रम में जिले के विभिन्न क्षेत्रों से आए 100 से अधिक प्रगतिशील किसानों ने प्रतिभाग किया।

इस वर्ष विश्व मृदा दिवस की थीम 'स्वस्थ शहरों के लिए स्वस्थ मिट्टी' रही, जिसके अनुरूप विशेषज्ञों ने मिट्टी परीक्षण, पोषक तत्व प्रबंधन, प्राकृतिक खेती और मृदा संरक्षण पर विस्तृत जानकारी दी। कार्यक्रम का शुभारंभ केंद्र के वरिष्ठ वैज्ञानिक एवं अध्यक्ष डॉ. पंकज नौटियाल ने किया। उन्होंने अपने संबोधन में कहा कि स्वस्थ मिट्टी अन्न उत्पादन, खाद्य एवं पोषण सुरक्षा, जलवायु परिवर्तन से निपटने और जैव विविधता संरक्षण की आधारशिला है।

उन्होंने मृदा स्वास्थ्य कार्ड की उपयोगिता, मिट्टी जांच की सही समयावधि तथा पोषक तत्व संतुलन बनाए रखने के वैज्ञानिक तरीके किसानों को बताए। केंद्र के मृदा वैज्ञानिक डॉ. त्रिलोक नाथ राय ने खेत से मृदा नमूना लेने की सही विधि का प्रदर्शन किया और कहा कि 'सही नमूना ही सटीक परीक्षण की पहली जरूरत है।' शस्य विज्ञान विशेषज्ञ डॉ. त्रलोकि सिंह ने मृदा पोषक तत्वों की भूमिका और फसल उत्पादन में मृदा प्रबंधन के वैज्ञानिक उपाय बताए। कार्यक्रम का संचालन कर रहे प्रसार विशेषज्ञ डॉ. मोहित सिंह ने मृदा संरक्षण, आधुनिक कृषि तकनीकों और फसल प्रबंधन पर उपयोगी सुझाव दिए। गृह विज्ञान विशेषज्ञ सुश्री अंजली साहू ने प्राकृतिक खेती से मिट्टी की उर्वरता बढ़ाने के तरीकों पर प्रकाश डाला, वहीं मत्स्य विशेषज्ञ सुश्री थांगा अनुसया ने प्राकृतिक संसाधनों के संरक्षण तथा जैविक खेती के महत्व पर जोर दिया। मीराखेड़ा, पूरबामान, लालामाऊ, मदारीखेड़ा, छावन, रामपुर, ढिकुननी, पंवाया, सरवा, बरैया, पिरनखेड़ा, बसंतापुर सहित कई गांवों के किसान कार्यक्रम में शामिल हुए। अंत में किसानों को मृदा स्वास्थ्य कार्ड वितरित किए गए, जिससे वे अपनी मिट्टी की उर्वरता को समझकर वैज्ञानिक रूप से फसल उत्पादन बढ़ा सकें। कृषि विज्ञान केंद्र ने भविष्य में भी किसानों को मृदा स्वास्थ्य, उन्नत कृषि पद्धतियों और सतत खेती से संबंधित तकनीकों पर सतत प्रशिक्षण देने की प्रतिबद्धता व्यक्त की।

News paper coverage – KVK, Hardoi-II, 2025

Celeberation of world soil day by Dr. T.N. Rai., 5.12.2025.

Conclusions

It was determined from the study that out of the study sample, majority of the farmers perceived that SHC results having positive impacts in terms of minimizing the cost of cultivation, improves the soil fertility, nutrient management, selection of suitable crops and reclamation of problematic soils. Whereas, when comes to adoption, Majority of them have not followed what they have perceived. With respect to yields farmers perceived that fertilizers recommended as per SHC are not sufficient results in lowering yields. As most of the farmers are tenant, they concentrate more on yield than the soil fertility. As ultimate outcome of any farming is higher yields followed income. Hence, farmers need to be convinced that SHC results not only increase the soil fertility but also increase the yields followed by income by minimizing the excessive use of fertilizers. As seeing is believing, a large number of result demonstration on SHC need to be conducted in order to create awareness followed by adoption among the practicing farmers.

Competing interest's disclaimer

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

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