



Paddy Growers' Knowledge of Soil Health Card in North Coastal Region of Andhra Pradesh

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HIGHLIGHTS

- The study establishes the importance of the Soil Health Card in increasing the productivity of the Paddy growers.
- Moderate to low SHC usage among paddy growers and even the awarded farmers often do not utilize its recommendations.
- It is crucial to expand proper training, extension services, and campaigns to utilize the advantages of the SHC scheme fully.

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ABSTRACT

Paddy cultivation demands site-specific care from transplanting to post-harvest. Soil health cards offer farmers insights for effective fertilizer use, tailored to their soil's condition. The research was led in the years 2023-2024 to know knowledge of soil health card by paddy growers in the north coastal of Andhra Pradesh. Samples were collected from six mandals across Rajam, Therlam, Bobbili from Vizianagaram district, and Ponduru, Hiramandalam, and Ecterla from Srikakulam district, totalling 180 respondents from 12 villages. Some Paddy growers have a comprehensive knowledge of SHCs and their importance in enhancing soil health and crop productivity, while others have limited awareness or misunderstandings. The research highlights obstacles to the utilization of SHCs, such as insufficient means of communication, and doubts regarding the effectiveness of SHCs. Findings revealed that the majority of respondents displayed a medium level of knowledge that is (45.00%) followed by paddy growers with low levels (27.77%) and (27.33%) paddy growers had a high level of knowledge about soil health cards.

INTRODUCTION

India is on track to boost agricultural output through long-term improvements in crop and soil quality. Rice (*Oryza sativa*) is a cereal and a food. Rice, a staple meal for more than half of the world's population, is farmed in over 100 nations, with Asia accounting for 90 per cent of total global output (Samal et al., 2022). In addition to having a considerable number of calories, rice is also rich in numerous critical vitamins, minerals, and other nutrients. A great source of carbohydrates, thiamine, calcium, iron, folate, vitamin B5, vitamin E, and vitamin B5 are all known to be present

in it (Mohidem, 2022). For farmers to maintain high crop output and profitability, their soil fertility and health are key indicators (Kaur et al., 2020). The foundation for the growth and development of all economically significant plants is soil. It is a mixture of liquids, gases, many microorganisms, and organic and inorganic components (Selvi et al., 2021). According to a study most cultivators habit chemical fertilisers without being conscious of the actual fruitfulness of their grounds (Chowdary et al., 2018). Lastly, the careless application of chemical fertilisers derived from fossil fuels has led to a decline in soil health, biodiversity, and fertiliser usage efficiency (crop: nutrient response ratio dropped to 8.59 in 2009–10 from

14.06 in 1990–91). Additionally, it has polluted the ecosystem (Singh et al., 2020). Using sustainable soil fertility management techniques based on soil testing results can optimise fertiliser usage as a single solution to all of these issues (Saha et al., 2016). One of the main issues facing modern agriculture is soil degradation. The field of soil science has tackled significant environmental issues such as food production, biodiversity loss, global warming, water quantity and quality, and biodiversity (Lal Rattan et al., 2020). A Government of India programme called Soil Health Card is supported by the Ministry of Agriculture and Farmers' Welfare (Ghaswa et al., 2019). The programme is to give all farmers in the nation soil cards and crop-specific suggestions for the nutrients and fertilisers needed for their particular farms to assist farmers in increasing production. Based on scientific guidelines, farmers can monitor and improve soil health with the use of the soil health card (Kumar et al., 2021). The amount of dangerous trace elements like uranium or cadmium that are added to agricultural soil can be reduced by lowering the use of mineral P fertilisers according to a study by (Nacke et al., 2013). So, knowledge of nutrient application on the part of the operational farmers calls forth attention of policymakers. Still, the scheme's effectiveness is primarily dependent on how wisely farmers employ the nutrients in their soil. everything mentioned above in mind, the research study was conducted to estimate the knowledge level of soil health cards by paddy growers in north coastal regions of Andhra Pradesh.

METHODOLOGY

A descriptive research design, was employed in this study while keeping the goal in mind. Farmers living in the Srikakulam & Vizianagaram districts who held a soil health card from paddy growers were the research's intended respondents. The structured interview schedule that was used to gather the data required for the study. A timetable was created and information was gathered from the chosen respondents through in-person interviews. The districts of Srikakulam and Vizianagaram were specifically chosen for the study and are where the research was conducted. The selection of these districts was deliberate due to the following reasons: Srikakulam and Vizianagaram districts are known for cultivating Paddy crops extensively. There is a great opportunity to promote the adoption of the Soil Health Card among Paddy farmers in these districts. Additionally, no previous studies have been conducted in these areas. The investigation was successfully concluded within the given timeframe as a result of the investigator's residency and educational engagements in the districts of Srikakulam and Vizianagaram. Three mandals were picked from Vizianagaram and three mandals from Srikakulam districts using the simple random sample technique, and two villages were chosen within each Mandal. A study was conducted in the selected mandals, including Ponduru, Hiramandalam, and Ecterla from Srikakulam district, as well as Rajam, Therlam, and Bobbili from Vizianagaram district. From 180 respondents, 90 respondents were selected from the Srikakulam and 90 respondents from the Vizianagaram districts. These regions were singled out because of the large number of paddy growers with soil health cards living there. fifteen paddy farmers having soil health cards were randomly chosen from each village, resulting in a total of 180 respondents. The data was effectively

analyzed using a wide range of statistical tools in the research. Important measures like linear correlation, multiple regression, and percentage analysis were carefully utilized, taking advantage of the versatile capabilities of Opstat software. Additionally, a systematic approach was followed in the selection process of items for the knowledge test on soil health management. An arbitrary scaling technique was used to ensure a balanced representation of relevant topics. The objective of this method was to improve the comprehensiveness and relevance of the test items. The respondents' levels of knowledge were divided into low, medium, and high categories using the mean and half standard deviation values.

RESULTS

Knowledge regarding soil testing

It is revealed in Table 1 that the bulk of the paddy growers possessed a medium to low level of knowledge about soil health cards viz., soil sampling (83.88%), precautions to take while taking a soil sample (61.66%), awareness that each farm can have its unique nutrient status determined by examining a sample of soil (66.66%), website offering information regarding the soil health card (45%), details needed to access the soil health card on the internet (42.77%), whether soil health card programme is helpful for understanding the chemical and physical characteristics of soil (41.66%). Conversely, the level of knowledge regarding the macronutrient status on the soil health card was also depicted Little understanding of: Does the soil health card offer P.H. information? Does the soil health card include information on electric conductivity? (37.22%). (36.66%), when was the soil health card programme launched? Which website offers information about the soil health card (36.11%)? (36.11%), Is there a way to figure out how much fertiliser to use based on the available nutrients? Do you know that farmers 30.55 per cent can obtain information on soil type from the computer provided to the gramme panchayat as part of the e-village project? (28.33%), Are you aware that agricultural systems based on integrated fertiliser management are offered via soil health cards? Does the soil health card (28.33%) include information on soil temperature (28.33%), Does the soil health card provide information about available soil moisture? (23.33%). 45 per cent of respondents who had soil health cards had a medium level of knowledge about soil health cards, compared to low levels (27.77%) and high levels (27.33%), respectively. The outcomes could be the consequence of long-term emphasis on soil health management brought about by several governmental and non-governmental programmes.

Relationship of personal, socio-economic and psychological factors with knowledge

The null hypothesis and the empirical hypothesis were used to investigate the relationship between the scores of the chosen independent variables and the degree of knowledge. After the correlation coefficient (r) was calculated, the results are shown in Table 2. Table 2 shows that the knowledge level of Soil Health Card holders was significantly and positively correlated with their education, farming experience, occupation, social participation, land holding, extension contact, information-seeking behaviour, scientific

Table 1. Item-wise knowledge of respondents about recommended paddy production technology

S.No.	Statement	Percentage
1	How is the soil sample to be taken?	83.88
2	Do you know which type of precautions to be while taking a soil sample?	61.66
3	When soil health card scheme was started	36.11
4	Which state started soil health card scheme first	36.11
5	Which website provides details about soil health card	45.00
6	Which information is required to open soil health card on the website?	42.77
7	Do you know that soil health card provides Integrated Fertilizer Management based cropping system?	28.33
8	Are you aware that farmers can obtain data regarding soil type from Gram panchayats using computers provided as part of the e-village project?	26.66
9	Are you aware that soil samples from farms can be analysed to determine the varying nutrient content of each farm	66.66
A	Among the following, which macronutrient status is displayed in soil health card?	
10	Nitrogen	56.66
11	Phosphorus	54.44
12	Potash	68.33
B	Among the following, which micronutrient status is displayed in soil health card?	
13	Magnesium	64.44
14	Zinc	63.88
15	Manganese	58.88
16	Iron	52.77
17	Cobalt	50.00
18	Boron	53.88
19	Calcium	49.44
20	Is it helpful to know the chemical and physical qualities of soil through the Soil Health Card Scheme?	41.66
21	Does the soil health card have a temperature sensor?	28.33
22	Does soil health card provide information about available soil moisture?	23.33
23	Can I find out about electric conductivity from a soil health card?	36.66
24	Does soil health card provide information about P.H.?	37.22
25	Whether any method is provided to calculate the dose of fertilizer from the available nutrients?	30.55

orientation, and attitude towards the card at the 5 per cent significance level. On the other hand, the age and annual income of Soil Health Card users did not significantly correlate with their degree of expertise.

Multiple regression coefficients of knowledge on different parameters

The effect of independent variables on knowledge showed that, education, farming experience, Occupation, Social participation, Size of land holding, Extension contact, Information seeking behaviour, Scientific orientation, Attitude towards soil testing at five per cent level of significance. The R^2 of regression model suggested that, all the variables together explained to the extent of 63.59% of variability observed in the knowledge of soil health card by paddy growers.

DISCUSSION

The majority of the paddy growers have medium to low levels of knowledge due to their primary to secondary education as depicted by other studies like Nain and Chandel (2010); Kumat & Nain (2012); Slathia et al., (2013). The educational background of paddy growers largely contributes to their limited knowledge of soil health. The majority of these growers have received education only up to the primary or secondary level, which does not adequately expose them to advanced agricultural concepts, scientific methodologies, or specialized knowledge in soil science. Consequently, they may lack the fundamental understanding required to comprehend the intricate

and technical information provided in soil health cards. Soil health cards are created to provide a comprehensive overview of various soil parameters, such as pH levels, nutrient content (nitrogen, phosphorus, and potassium), organic matter, and the presence of essential micronutrients. This data is essential for making well-informed decisions about soil management and crop cultivation. However, the information on these cards is often presented in a way that requires a certain level of scientific literacy to interpret correctly. For many paddy growers with limited educational backgrounds, the technical terminology and scientific data can be overwhelming. This

Table 2. Relationship of personal, socio-economic and psychological factors with knowledge (n=180)

Factors	Independent variable	Correlation coefficient
X1	Age	-0.027 ^{NS}
X2	Education	0.297*
X3	Farming experience	0.331*
X4	Occupation	0.251*
X5	Social participation	0.343*
X6	Landholding	0.298*
X7	Annual income	-0.108 ^{NS}
X8	Extension contact	0.426*
X9	Information seeking behaviour	0.259*
X10	Scientific orientation	0.391*
X11	Attitude towards soil testing	0.343*

*=5% level of significant, ** =1% level of significant, NS = Non-significant

Table 3. Multiple regression coefficients of knowledge on different parameters

Factors	Variables	Coefficient	"t" value	Standard error
X1	Age	-0.123	-1.391	0.089
X2	Education	0.652	5.914	0.110
X3	Farming experience	0.037	2.951	0.013
X4	Occupation	0.738	3.761	0.196
X5	Social participation	0.075	-2.257	0.033
X6	Size of land holding	0.114	-0.858	0.133
X7	Annual income	-0.098	-1.354	0.073
X8	Extension contact	0.003	-0.365	0.008
X9	Information seeking behaviour	0.007	0.887	0.008
X10	Scientific orientation	0.002	0.293	0.008
X11	Attitude towards soil testing	0.062	5.912	0.010

*=5% level of significant, **=1% level of significant, R²= 0.6359

complexity can lead to difficulties in understanding and effectively utilizing the information provided. This particular group comprises of farmers who possess limited knowledge of soil science and agricultural practices. Their educational background does not provide them with exposure to the necessary concepts, which makes it difficult for them to understand the technical information presented on soil health cards. Consequently, these farmers may find the data confusing and are less likely to effectively implement the recommended practices. Similar findings were found by Sagwal & Malik (2001); Thiagarajan (2011); Patel (2012); Slathia et al., (2015); Pandya & Timbadia (2016).

CONCLUSION

It can be defined that the majority of paddy farmers with soil health cards from Srikakulam and Vizianagaram districts are of middle age group with primary education. The value of the Knowledge Index supports the analysis of the study on the knowledge level of soil health card holders, which reveals that the majority of the respondents (45%) had medium followed by (27.7%) low level knowledge about recommended paddy production technology in soil health card. Therefore, to spread technology widely, more facilities and scientific and educational training are needed, as indicated by the farmers and by the problems they encounter. Extension agents can take the initiative in removing these obstacles and encouraging widespread technology adoption.

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