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A Study on Knowledge and Attitude of Farmers and Constraints Faced by Them on Soil Health Cards in Mandya District of Karnataka

Madhu H.R.[1], A.D. Ranganatha[2], G. Nagesha[3] and Mahesh D. S.[4*]

[1]M.Sc. (Agri). P.G. Research Scholar, Department of Agricultural Extension, UAS, GKVK, Bengaluru
[2]Associate Professor & Head and [3]Assistant Professor, Department of Agricultural Extension,
College of Agriculture, V.C. Farm, Mandya, UAS, Bengaluru
[4]Scientist, CMER&TI, Lahdoigarh, Jorhat, Assam
*Corresponding Author E-mail: maheshdnpura@gmail.com
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ABSTRACT

The present study was carried out during 2018-19 to analyse the knowledge and attitude level of farmers about Soil Health Card (SHC). Out of 120 soil health card holders 60 farmers were selected from each in Mandya and Maddur taluks of Mandya district. The respondents were randomly selected for the study. Data was collected using a pre-tested interview schedule. A large number of the farmers (49.16%) had medium level of overall knowledge regarding SHC, while 27.50 and 23.33 per cent of the farmers had high and low level of overall knowledge regarding SHC, respectively. It was also found that a majority of farmers (80.00%) were having favorable to more favorable attitude towards SHC. Education, achievement motivation, management orientation, scientific orientation, Cosmopoliteness, mass media exposure, risk orientation, extension agency and extension participation of farmers had significant to highly significant association with their knowledge and attitude towards SHC. Around 70 and 72 per cent of the variation in the knowledge and attitude level of farmers respectively It was explained by all the 14 independent variables selected for the research study. Delay in distribution of soil health cards, fertilizers calculations are not given in SHC, difficulty in following the soil test based results, illiteracy of farmers, lack of awareness regarding method of soil sampling and inadequate follow-up by extension agency were the major problems faced by the farmers.

Keywords: Soil health card, Profile characteristics, Knowledge, Attitude, Constraints, Suggestions

INTRODUCTION

India is on the verge to improve the agricultural productivity by improving the soil quality and crop quality in a sustainable way. In this view, central government had launched the soil health card scheme in February 2015 with an aim to promote soil test based application of fertilisers in respect of all the 14 crore holdings in the country and to implement uniform norms in sampling and testing of soil.

Under this scheme, soil health cards are given to farmers for their land holdings for every 3 years. Soil health card was a printed report and it provides information about 12 soil parameters (pH, EC, organic carbon, macro nutrients like nitrogen, phosphorus, potassium, sulphur and micro nutrients like zinc, iron, manganese, copper and boron). It also suggests corrective measures that a farmer should adopt to obtain better yield. Soil test based recommendations not only increase the crop production with judicial investment on fertilizers but also help to keep the sustainable soil productivity.

The soil health card scheme brings together the scientific community in the field of agriculture, the information repository of latest tool, techniques and cropping practices, the farmers and the government for the economic upliftment of the people at large. Since, change in knowledge preceded acceptance and application of an innovation, it was therefore, always important to find out the factors responsible for positive or negative attitude associated with farmer toward the soil health card. With this background, there is a need to assess the knowledge and attitude of farmers about soil health card. Keeping this in view, the present investigation was designed with the following objectives.

1. To assess the knowledge level of farmers about soil health card.
2. To assess the attitude level of farmers about soil health card.
3. To study the profile characteristics of the farmers and their association with the dependent variables.
4. To elicit the constraints faced and suggestions given for better implementation of SHC.

An earnest attempt has been made in this study to explore the knowledge and attitude level of farmers towards soil health card. This provides a valuable feedback to the government about the effectiveness of soil health card scheme. The study also aims to document the constraints faced and suggestions by the farmers in the usage of soil health card which will helpful to concerned authorities to tackle the problems and make the scheme farmer friendly. The results of the study will help the concerned policy makers, researchers and extension agencies to give thought and redesign the extension efforts.

MATERIALS AND METHODS
The study was conducted in Mandya and Maddur taluks of Mandya district of Karnataka state during the year 2018-19. Mandya district was purposively chosen for the study as it is significantly distributed highest number of soil health cards to farmers as compare to other districts of the state. Mandya and Maddur taluks were selected among the seven taluks of the Mandya district, based on the highest number of soil health cards distributed. The village-wise information relating to soil health card holders were obtained from Department of Agriculture and ICAR KVK Mandya. The top six villages having the highest number of soil health card holders in Mandya and Maddur taluks were selected for the purpose of the study. Sixty farmers from each taluk by considering 10 farmers from each selected village and thus the total sample constituted to 120.

Ex-post-facto research design was adopted for the research study. Data was collected personally from the respondents using a pre-tested interview schedule.

The dependent and independent variables for the present investigation were chosen based on the available literature and the objectives of the investigation.

Operationalization and measurement of variables

Variables
A. Dependent variables
a) Knowledge b) Attitude

B. Independent variable	
1	Age
2	Education
3	Annual income
4	Occupation
5	Land holding size
6	Farming experience
7	Scientific orientation
8	Risk orientation
9	Management orientation
10	Achievement motivation
11	Cosmopoliteness
12	Extension participation
13	Mass media exposure
14	Extension contact

Respondents were asked to express problems faced by them in the usage of soil health card. The problems faced by them are termed as constraints in the study.Thus, obtained responses were expressed in terms of frequency and percentage. Suggestions were articulated by the farmers for better usage of soil health card were recorded and were expressed in terms of frequency and percentage.

The data collection was done during the period March-April 2019 by personal interview method with the help of the constructed interview schedule.

The data collected for the purpose of the study were quantified, categorized and tabulated. The following statistical tools were used in the study to analyse the data.

Mean: The arithmetic mean is the sum of the scores divided by their number. This measure was used to categorize the dependent and independent variables into low, medium and high categories.

$$Mean = \frac{\text{Sum of observed values}}{\text{Number of observations}}$$

Frequency: This measure was used to know the distribution pattern of respondents, variable wise and to categorize the problems perceived by seed growers in order of importance.

Percentage: This measure was used for simple comparisons.

Standard deviation: This measure was used to categorize the dependent and independent variables into low, medium and high categories.

Chi-square test: The chi-square test was applied to find out the association between independent (Profile characteristics) and dependent variables (knowledge and attitude of farmers about soil health card.). It is the difference between the observed and expected frequencies; same was squared and divided by the expected frequencies. Further, all the quantities obtained independently are added then the sum total obtained is Chi-square ($\chi 2$) value.

$$X^2 = \Sigma (fo - fe)^2 / fe$$

Where, fo = observed frequencies
fe = expected frequencies

RESULTS AND DISCUSSION

I. Association between profile characteristics of the farmers with their knowledge and attitude about SHC.

Chisquare test was employed to find out the association between profile characteristics of the farmers with their knowledge and attitude about SHC.

1. Association between Profile characteristics of the farmers with their knowledge regarding SHC

The association between profile characteristics of the farmers with their knowledge regarding SHC presented in table 1. The results reveals that variables such as, age, occupation, annual income, land holding and farming experience had non significant association with the knowledge level of farmers, whereas variables such as achievement motivation, management orientation, cosmopolitans, risk orientation and mass media exposure of farmers had significant association with their knowledge level on SHC at five per cent level. Variables such as, education, scientific orientation, extension agency contact and extension participation of farmers had highly significant association with their knowledge level regarding SHC at one per cent level. The results obtained were in line with the similar studies done by Banerjee (1976), Prakash and De (2009), Lakshminarayan et al. (2013) and Prabuilliger et al. (2017).

The explanation for the profile characteristics of the farmers having significant to highly association with the knowledge level regarding SHC was discussed in the following paragraphs.

a. Education and knowledge regarding SHC

The chi-square test revealed a highly significant association exist between the education of farmers with their knowledge level regarding SHC at one per cent level. Education of an individual provides an opportunity for the farmers to expose themselves to mass media (radio, television, newspaper etc.), which carry messages on the special features and benefits of SHC scheme,

hence there exist a significant relationship between education and knowledge level.

b. Achievement motivation knowledge regarding SHC

Achievement motivation was the important determinant of excellence or perfection in what one does. It forces the individual towards reaching the goals which he/she has to set for himself. The farmers have excelled in knowing and obtaining the benefits of the SHC for excelling in agriculture by contacting extension functionaries and participating in extension activities. Hence, there exists a significant association at five per cent level between achievement motivation of the farmers with their knowledge regarding SHC.

c. Management orientation and knowledge regarding SHC

The probable reason for management orientation of farmers in having significant association at five per cent level with their knowledge regarding SHC could be due to the inculcation of managerial abilities in the farmers through extension activities (meetings/discussion, training programs, field visits, demonstrations, exposure visits, farm school etc.) organized. The orientation towards these extension activities by Karnataka State Department of Agriculture has increased knowledge regarding SHC among farmers.

d. Scientific orientation and knowledge regarding SHC

It was clear from the data depicted in the table that scientific orientation had significant association with the knowledge level of respondents towards soil health card at one per cent level of significance. The higher achievement motivation and management orientation inspires them to know scientific advantages of SHC.

e. Cosmopoliteness and knowledge regarding SHC

A cosmopolite farmer during his visit to offices of agricultural extension personnel which are located at Hobli/ Taluk/ District, might have seen the display of information on SHC. He might have interacted with the agricultural extension personnel regarding the procedure of getting benefits under SHC.

Hence, there exists a significant association between Cosmo politeness of farmers with their knowledge level regarding SHC.

f. Mass media exposure and knowledge regarding SHC

Higher levels of mass media exposure would have facilitated the farmers to develop habits of gathering information about SHC implemented by Department of Agriculture, hence there was a significant association between mass media exposure of farmers with their knowledge regarding SHC.

g. Risk orientation and knowledge regarding SHC

There existed a highly significant association between risk orientation and the knowledge level of farmers at five per cent level. The reason may be farmers take moderate risk to precisely to achieve success, stabilized and maximization of yield and income by following SHC information.

h. Extension agency contact and knowledge regarding SHC

There was highly significant association between the extension agency contacts of farmers with their knowledge regarding SHC. Agricultural extension professionals not only communicate about the latest farm technologies to the farmers, but

they also inform the farmers about various agricultural or extension programs /schemes /reforms implemented by State Department of Agriculture. Hence, farmers with high level of extension agency contact have more knowledge regarding SHC.

i. Extension participation and knowledge regarding SHC

The results of the study reveal that extension participation of farmers was highly significant associated with the knowledge level regarding SHC. Participation in extension activities such as, group discussion, demonstrations, training programs, field days, farmers field school, krishimelas, *etc*., organized would promote in gaining knowledge among farmers regarding the scope and benefits for farmers by SHC. Hence, there exist a significant association between extension participation and knowledge level.

Hence, the hypothesis set for the study i.e., there is no association between the profile characteristics of the farmers with their knowledge level regarding SHC is partially rejected, since many of the profile characteristics of the farmers had significant and some are highly significant association with the knowledge level regarding SHC.

Table 1: Association between profile characteristics of the farmers with their knowledge regarding SHC

Sl. No.	Characteristics	Chi-square value	C-value
1	Age	3.67^{NS}	0.17
2	Education	10.04^{**}	0.27
3	Occupation	5.67^{NS}	0.21
4	Annual income	6.01^{NS}	0.21
5	Land holding	3.74^{NS}	0.17
6	Farming experience	4.46^{NS}	0.18
7	Achievement motivation	10.34^{*}	0.28
8	Management orientation	11.88^{*}	0.30
9	Scientific orientation	10.10^{**}	0.27
10	Cosmopoliteness	9.45^{*}	0.27
11	Mass media exposure	10.33^{*}	0.28
12	Risk orientation	11.33^{*}	0.29
13	Extension agency contact	17.39^{**}	0.35
14	Extension participation	16.69^{**}	0.34

NS=Non-significant, *=Significant at 5% level, **=Significant at 1% level

2. Association between profile characteristics of the farmers with their attitude towards SHC

The data in table 2 shows the association between profile characteristics of the farmers with their attitude towards SHC. A perusal of table reveals that age, occupation, annual income, land holding and farming experience of farmers had no association with their attitude towards SHC. Education, achievement motivation, management orientation, scientific orientation, cosmopoliteness and mass media exposure of farmers had significant association with their attitude towards SHC at five per cent level. Variables, such as risk orientation, extension agency contact and extension participation of farmers had highly significant association with their attitude towards SHC at one per cent level. Similar findings were reported by Banerjee (1976), Prasad and Sundaraswamy (2000) and Subhash (2018).

The explanation for the independent variables having significant to highly significant association with the attitude towards SHC is given in the ensuring paragraphs.

a. Education and attitude towards SHC

Education widens the vision and minds of people, besides orienting them to the outside world. Educated farmers might have contacted the agricultural extension workers to obtain the information on SHC (importance and the benefits to farmers) and have developed favourable attitude towards SHC. Hence, it may be concluded that education of the farmers influences the attitude towards SHC.

b. Achievement motivation and attitude towards SHC

Achievement is the value associated with an individual that drives them to excel in farming and thereby attain a sense of personal accomplishment. In order to achieve this distinction, the farmers would have availed the benefits of SHC in the form of reducing input cost by balanced use of chemical fertilizers. Hence, there exists a significant association between the achievement motivations of farmers with their attitude towards SHC.

c. Management orientation and attitude towards SHC

Management orientation offers a chance for better management of resources resulting in greater efforts toward excellence in farming. The urge to perform better than others will act as an instrument to acquire and adopt managerial components relating to agriculture. SHC provide information regarding balanced use of fertilizers to the farmers and increases the income of farmers thereby helping the farmers in managing their farm enterprise. Thus, there was a significant association between management orientation of farmers with their attitude towards SHC.

d. Scientific orientation and attitude towards SHC

Scientific orientation develops trustworthiness in scientific methods of agricultural technology which ultimately build up confidence which act as catalyst in rational thinking lead to its significant influence in developing favourable attitude towards SHC.

e. Cosmopoliteness and attitude towards SHC

A cosmopolitan farmer always looks for more information on improved agricultural technologies and various schemes implemented by the line departments. Hence, these farmers will more frequently visit the offices of the line department developments located at towns to derive more benefits from State and central government sponsored agricultural programmes. As a consequence, there exists a highly significant association between the cosmopoliteness of the farmers and their attitude towards SHC.

f. Mass media exposure and attitude towards SHC

Exposure to mass media like radio, television, newspaper, magazines *etc*., has helped the farmers in knowing the various benefits under SHC. The farmer feels that the SHC enables them to increase their knowledge on crop planning and was an effective means to increase agricultural production. Hence, there exists a significant association at one per cent level between mass media exposure of farmers with their attitude towards SHC.

g. Risk orientation and attitude towards SHC

A highly significant association was observed between the risk orientation and attitude of farmers towards SHC at 1 per cent level of significance. The reason may be farmers take moderate risk to precisely to achieve success, stabilized and maximization of yield and income by following SHC information.

h. Extension agency contact and attitude towards SHC

Frequent contacts with the agricultural extension functionaries have helped the farmers in knowing about the benefits available to farmers by SHC. The farmers believe that SHC would help in increasing the crop productivity and income. Hence, contact with extension agency has exhibited a highly significant association with their attitude towards SHC at one per cent level.

i. Extension participation and attitude towards SHC

It can be observed from the results that extension participation of farmers had positive and significant association with the attitude towards SHC. Frequent and active participation of farmers in extension activities organized about SHC might act as strong motivational factor for possessing favourable attitude towards SHC.

The hypothesis set for the study i.e., There is no association between the profile characteristics of the farmers with their attitude towards SHC is partially rejected, since more number of the profile characteristics of farmers had significant to highly significant association with attitude towards SHC.

Table 2: Association between profile characteristics of the farmers with their attitude towards SHC

Sl. No.	Characteristics	Chi-square value	C-value
1	Age	1.49^{NS}	0.10
2	Education	10.46*	0.28
3	Occupation	3.60^{NS}	0.17
4	Annual income	3.41^{NS}	0.17
5	Land holding	1.09^{NS}	0.10
6	Farming experience	5.48^{NS}	0.21
7	Achievement motivation	11.47*	0.29
8	Management orientation	10.21*	0.28
9	Scientific orientation	11.61*	0.29
10	Cosmopoliteness	9.89*	0.27
11	Mass media exposure	12.16*	0.30
12	Risk orientation	10.11**	0.28
13	Extension agency contact	13.67**	0.31
14	Extension participation	14.11**	0.31

NS=Non-significant, *=Significant at 5% level, **=Significant at 1% level

II. Association between knowledge and attitude of farmers about soil health card

The results presented in the table 3 indicated that, both the dependent variables were associated with chi-square value of 15.09 which was significant at one per cent level of significance.

Out of the 28 farmers who had low level of knowledge on soil health card (16.66

%) had less favourable attitude towards soil health card. Out of 59 farmers with medium knowledge, one-fifth of them (20.00 %) had favourable attitude towards soil health card and out of 33 farmers with high knowledge level, almost all of them (25.00 %) had more favourable attitude towards soil health card.

Table 3: Association between knowledge and attitude of farmers about soil health card.

(n=120)

Attitude	Knowledge								Chi-square value
	Low (n=28)		Medium (n=59)		High (n=33)		Total (n=120)		
	No.	%	No.	%	No.	%	No.	%	
Less favorable	20	16.66	2	1.66	2	1.66	24	19.98	15.09**
Favorable	4	3.33	24	20	1	0.83	29	24.16	
More favorable	4	3.33	33	27.50	30	25	67	55.83	
Total		23.32		49.16		27.49	120	100.00	

** Significant at 1 per cent level

III. Constraints faced by the farmers in the usage of soil health card

The constraints faced by the farmers in the usage of soil health card are presented in Table 4. Delay in distribution of soil health cards (85%) and devoid of fertilizer calculations in soil health card (69.16%) were the major constraint expressed by the farmers in the usage of soil health card.

Difficulty in following the soil test based results (58.33 %) and illiteracy of farmers (56.67) were the next major constraints. Equal per cent of farmers (50.00 %) each perceived lack of awareness regarding method of soil sampling and 41.67 per cent farmers were facing inadequate follow-up by extension agency.

Table 4: Constraints faced by the farmers in the usage of SHC

n=120

Sl. No	Constraints	F	%	Rank
1	Delay in distribution of soil health cards	102	85	I
2	Illiteracy of farmers	68	56.67	IV
3	Lack of awareness regarding method of soil sampling	60	50.00	V
4	Inadequate follow-up by extension agency	50	41.67	VI
5	Difficulty in following the soil test based results	70	58.33	III
6	Fertilizer calculations are not given in soil health card	83	69.16	II

Constraint analysis has become an important thrust area of extension research in recent days. The constraint analysis would help to lubricate the process of diffusion of new technologies among farmers. The constraints

faced by the farmers in the usage of soil health card are discussed below.

Majority of the farmers complained about delay in the distribution of soil health card, due to which farmers were not able to

practice recommended fertilizer application. Results need to be provided before commencement of kharif season so that farmers can be benefitted more.

It was difficult for the illiterate farmers to refer and understand the content of soil health card they need the assistance of other literate farmers in this regard. Therefore, illiteracy of farmers was considered as one of the constraint.

IV. Suggestions expressed by the farmers to overcome the constraints expressed by them about SHC.

Suggestion refers as an opinion about constraints which can be used as solution to

overcome or to minimize them. In order to develop an extension strategy, it was essential to seek the opinion of the respondents who directly involved in use of SHCs. The constraints faced by them may sometimes be imaginary and sometimes due to lack of coordination of different levels.

The respondents were requested to offer their valuable suggestions against difficulties faced by them in use of Soil Health Card. The suggestions receiving high percentage was considered as an important suggestion and the suggestion receiving low percentage considered as less important.

Table 5: Suggestions expressed by the farmers to overcome constraints

(n=120)

Sl. No.	Suggestions	Farmers		
		Number	**Per cent**	**Rank**
1	Government could organize training programs to aware farmers about SHC	76	63.33	V
2	SHC should made available on time	102	85	I
3	Training should be given on proper method of collecting soil sample	87	72.50	II
4	Method of fertilizer application should be given	83	69.16	III
5	Soil sampling procedure should be done in presence of farmers	80	66.66	IV

The data presented in table 5 reveal that major suggestions given by the farmers to overcome the constraints associated with acceptance of soil health card were: SHC should made available on time (85%), Training should be given on proper method of collecting soil sample (72.50%), Method of fertilizer application should be given (69.16%), Soil sampling procedure should be done in presence of farmer (66.66%) and Government could organize training programs to aware farmers about SHC (63.33%).

To optimize the findings, majority of the farmers had suggested that there should be timely availability of Soil Health Card to the farmers. Training should be given on proper method of collecting soil sample and method of fertilizer application should be displayed in SHC.

CONCLUSION

The soil health card scheme brings together the scientific community in the field of agriculture, the information repository of latest tool, techniques and cropping practices, the farmers and the government for the economics upliftment of the rural people at large. Since, change in knowledge preceded acceptance and application of an innovation, it was therefore, always important to find out the factors responsible for positive or negative disposition associated with farmer toward the soil health card. Education, achievement motivation, management orientation, scientific orientation, cosmopoliteness, mass media exposure, risk orientation, extension agency contact and extension participation of farmers had significant to highly significant association with their knowledge and attitude towards

SHC. About 70 and 72 per cent of the variation in the knowledge and attitude level of farmers respectively was explained by the 14 profile characteristics selected for the research study. Delay in distribution of SHC (Rank I), devoiding fertilizer calculation in SHC (Rank II), difficulty in following the soil test based results (Rank III), and inadequate follow up by the extension agency (Rank IV) were the major problems faced by the farmers. SHC should made available on time (Rank I), training should be given on proper method of collecting soil sample (Rank II), method of fertilizers application should be given(Rank III) and soil sampling procedure should be done in presence of the farmers (Rank IV) were the important suggestions offered by the farmers for the effective usage of SHC.

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