A Survey on Awareness and Adoption of Soil Health Card (SHC) Recommendations by the Farmers in YSR District of Andhra Pradesh

A. Veeraiah[1], C. Prathyusha[2]*, V. Shilpakala[3], S. Ramalakshmi Devi[4] and B. Padmodaya[5]
[1]Programme Coordinator, Krishi Vigyan Kendra, Utukur, Kadapa (Andhra Pradesh), India.
[2]Scientist (Crop Production), DAATTC, Utukur, Kadapa (Andhra Pradesh), India.
[3]Subject Matter Specialist (Plant Protection), KVK, Utukur, Kadapa (Andhra Pradesh), India.
[4]Subject Matter Specialist (Extension), KVK, Utukur, Kadapa (Andhra Pradesh), India.
[5]Coordinator, DAATTC, Utukur, Kadapa (Andhra Pradesh), India.

(Corresponding author: C. Prathyusha*)

ABSTRACT: Soil health is the basic necessity for the ensurement of long term agricultural production. Soil health must be monitored on a regular basis to ensure that farmers provide the necessary nutrients while also taking benefit of those already present in the soil. But the quality of soil has been deteriorating in recent times due to indiscriminate use of fertilisers and imbalanced usage of chemicals. Considering this situation, the Government of India (GOI) initiated a flagship programme of soil health card scheme which aims at promoting soil test based and balanced use of fertilisers to enable farmers to realise higher yields at low cost. In the first cycle *i.e.,* 2015 – 16 to 2016 – 17 distributed 74,55,204 cards to farmers while in second cycle *i.e.,* 2017 – 18 to 2018 – 19 distributed 69,27,732 cards for farmers. A survey was conducted to study the awareness and adoption of soil health card recommendations by the farmers of YSR district of Andhra Pradesh during the year 2019-20. Through purposive sampling method, 64 respondents were selected from twelve divisions of the district. The data were collected through interview schedule prepared for the purpose. Frequencies, percentages, Mean and correlation were used in statistical analysis. The results showed that that majority of farmers (59.52%) agree with the benefits of soil health card recommendations, while 18.89 % of farmers remain undecided and 21.59 % disagree with the benefits of soil health card recommendations. Likewise, majority of farmers (60.14 %) are adopting the soil health card recommendations. However, the correlation Coefficients between independent variables, and dependent variables *i.e.,* awareness and adoption shown on – significant relationship.

Keywords: Soil health, Awareness, Adoption, Correlation.

INTRODUCTION

Intensive Agriculture has resulted in impressive growth in food grain production powered by improved varieties, application of fertilizers and assured irrigation. However, indiscriminate application of inorganic fertilisers can lead to negative environmental consequences which include runoff, erosion & contamination of water supplies & disruptions to aquatic life and affect the soil health & fertility. Also imbalanced application of fertilizers leads to deficiency of several nutrients which in turn affect the growth and productivity of crops. Precise and comprehensive measurements of soil health will provide the basis for soil health management (Liu *et al.,* 2018). That's why interpreting soil health management is vital to the sustainability and stability of the climate adaptive farming systems (Xue *et al.,* 2019).
Healthy soil is the basis for sustainability of income for the farmers. Fertilizers are the key inputs for increasing agricultural production but their continuous and imbalanced application deteriorates the soil health (Bangre *et al.,* 2021). And applying judicious doses of fertilisers & cropping pattern is the foremost step for sustainable farming. For this reason, Government of India launched Soil health card scheme on 19 February, 2015. Under the scheme, the Government plans to issue soil health cards to farmers which provide every farmer the status of available nutrients in his land and suggest him accordingly the dosage of fertilisers & essential soil amendments for good soil health and crop wise recommendations of nutrients & fertilisers to improve productivity through judicious use of inputs. This Scheme aims at promoting soil test based and balanced use of fertilisers to enable farmers to realise higher yields at low cost and also to make them aware about the appropriate amount of nutrients for the concerned crop depending on the soil quality.
A SHC is intended to denote soil nutrient status to each farmer and recommend him on the right usage of fertilisers and micronutrients and also on the required soil amendments to be used over a long run to maintain

soil health (Subhash *et al.,* 2019). Soil health card in basic as a printed report that a farmer is given for all his land holdings. It contains the status of soil considering 12 parameters N, P, K, S, Fe, Zn, Mn, Cu, B and pH, EC,OC. Considering these results, the soil health card will specify fertilizer recommendations and necessary changes required for the farm. The government plans to issue the cards to 14 crore farmers. In the first cycle *i.e.*, 2015 – 16 to 2016 – 17 74, 55, 204 cards were distributed, while in second cycle *i.e.,* 2017–18 to 2018 – 19 dispatched 69,27,732 cards to farmers. The main aim of introducing the soil health card scheme was to identify the type of soil and then inform farmers required measures for further improvement.

Knowing the motive and importance of the soil health card the present study was undertaken to study the farmers awareness and adoption of soil health card recommendations and as certain the constraints associated with adoption of SHC's by farmers.

MATERIALS AND METHODS

A Survey was conducted in YSR district of Andhra Pradesh. The district consists of 12 Agricultural divisions and 51 mandals. Out of which 3 mandals were selected randomly and from each mandal four villages were randomly selected and 5 farmers from each village were selected purposively. A total of 64 sample of farmers for the study were selected. To determine the awareness and adoption of soil health cards, an interview schedule was prepared. For awareness measurement, 11 statements were posed to the farmers to which three responses were recorded as Agree, Undecided and Disagree. With regard to adoption, farmers are posed with 6 statements and responses were recorded as adopted and non-adopted. The frequencies and percentages were worked out and mean values were given based on frequency and percentage. Statistics such as percentage, frequency, Mean, and correlation coefficients were used in the presentation.

RESULTS AND DISCUSSION

A. Characteristics of respondents

The data (Table I) indicated that majority of the respondents are (51.56%) from high aged group followed by 37.5 percent and 10.94 percent in middle aged group and young aged group respectively. This might be due to moving of young age people for other occupations. In cities due to higher income compared to Agriculture.

Table 1: Profile characteristics of respondents.

Particulars	Category	Frequency	Percentage
Age	Young (Upto 35)	07	10.94
	Middle (36 – 50)	24	37.50
	High (51 and above)	33	51.56
Education	Illiterate	20	31.25
	Primary School	17	26.56
	High school	16	25.00
	Inter	04	6.25
	Degree & above	07	10.94
Farming Experience	Up to 10 Years	06	9.38
	11 – 20	22	34.38
	21 and above	36	56.24
Size of holding	Marginal (up to 1ha)	9	14.06
	Small (1- 2.5 ha)	28	43.75
	Medium (2.5 – 5 ha)	19	29.69
	High (>5 ha)	08	12.50
Annual Income	< 1 Lakh	55	85.94
	1 - 2 Lakhs	07	10.94
	> 2 Lakhs	02	3.12
Family Size	Up to 5	54	84.37
	5 and above	10	15.63
Family Type	Joint	28	43.75
	Nuclear	36	56.25
Social participation	No membership	46	71.88
	Membership in one Organization	18	28.12
Extension contacts	Frequently	22	34.38
	Some times	25	39.06
	Rarely	17	26.56
Source of information	Private dealers	-	-
	Neighbors/friends	18	28.13
	AEOs	14	21.87
	MAOs	25	39.06
	ADAs	-	-
	Scientists	07	10.94

In case of education, majority (31.25%) of the respondents were illiterates, where as 26.56 percent respondents were educated up to primary school level, 25 percent up to high school level 6.25 percent up to Intermediate level and 10.94 percent were educated up to degree and above level. This might be due to lack of Job opportunities for high school and below high school level of education and they stayed in villages and depend on Agriculture for income.

The data (Table 1) revealed that majority (56.24%) belongs to above 20 years of farming experience, whereas 34.38 and 9.38 percent respondents possessed 10 – 20 years and below 10 years of farming experience respectively. This might be due to continuation of old age people in farming and moving of young people to cities for other jobs. The data about size of holding indicated, majority (43.75%) belongs to small farmers, 29.69 percent possessed medium holdings, 14.06 percent possessed marginal holdings and 12.50 % possessed large holdings.

The data of Table 1 indicated that majority 85.94 percent getting below one Lakh income per annum and where as 10.94 percent respondents gained between 1 – 2 lakh annual income/year. This might be due to maximum of the respondents belong to small and marginal farmers and also due to low level of income in Agriculture compared to other enterprises. The survey revealed that majority 39.06 percent respondents contacted mandal Agricultural officer for information on Agriculture, where as 28.13 percent Neighbours, 21.87 percent Agricultural extension officers and 10.94 percent contacted scientists respectively. This might be due to availability of mandal Agricultural officers very nearer to them in terms of distance. The table – 1 majority (56.25%) belongs to nuclear family and 43.75 % had joint family. This might be due to preference of people towards nuclear families compared to joint families at present in the existing society.

The Table 1 further indicated that majority (84.37%) respondents contain up to 5 members only in their family, where as 15.63 % of respondents contains family size of above 5 members. This might be due to preference for nuclear families and also due to self-imposed restriction of having one or two children per family. The above table – 1also reveals that majority (71.88%) of respondents had no membership in organisation; where as 28.12% of respondents had membership in one organisation. Further, data of Table 1 reveals that majority (39.06%) had extension contact sometimes only, 34.38 percent of respondents had frequent extension contact and 26.56 percent had rare extension contact. This might be due to that the programmes related to Agriculture not regularly attended by the farmers and also not approaching the extension agencies for solving day to day problems of Agriculture.

Table 2: Awareness level of farmers (n=64).

Sr. No.	Awareness	Agree		Undecided		Disagree	
		Freq	%	Freq	%	Freq	%
1.	The results given in SHC are reliable	46	71.87	13	20.3	5	7.83
2.	The results given in SHC are useful to increase yields	37	57.82	18	28.12	9	14.06
3.	The SHC were given in time	39	60.95	10	15.63	15	23.43
4.	The results given in SHC are useful to reduce cost of cultivation	33	51.56	16	25	15	23.44
5.	SHC helps in selecting right crop suitable to the soils	23	35.94	14	21.87	27	42.18
6.	Information provided in SHC helps to sustain soil fertility	46	71.88	10	15.62	8	12.50
7.	Information provided in SHC was simple to understand	48	75	8	12.5	8	12.5
8.	Information provided in SHC was simple to adopt	43	67.19	11	17.19	10	15.62
9.	Micro nutrient management is possible with SHC	36	56.25	9	14.06	19	29.69
10.	Problematic soils were easily diagnosed with SHC	35	54.69	14	21.88	15	23.43
11.	Reclamation of problematic soils with SHC	33	51.57	10	15.62	21	32.81

It could be observed from Table 2 that majority of the respondents (71.87%) agree that the results given in SHC are reliable, whereas 20.3 % respondents remain undecided and 7.83% respondents disagree with respect to reliability of SHC results. Regarding usefulness of SHC results in increasing the yields, 57.82% of the farmers agree with the statement but 28.12 % are undecided and 14.06% of farmers disagree with the statement. Similarly, 60.95 % of the farmers agree that the Soil Health cards are given in time, whereas 15.63% remain undecided and 23.43% of the farmers claim the delay in the issue of SHCs. Likewise, majority of the respondents (71.87%) agree that the results given in SHC are useful to reduce cost of cultivation, 25 % are undecided but 23.44% of farmers do not find any decrease in cost of cultivation with the use of SHC results. With regard to selection of suitable crop based of SHC, larger part of the respondents (42.18%) disagrees with the statement while 35.94% agree and 21.87% remain undecided. Also, most of the farmers (71.88%) agree that the information provided in SHC helps to sustain soil fertility, but 15.62% are undecided and 12.50% are disagreeing with the statement. Similarly, 75% and 67.19 % of farmers agree that the information provided in SHC was simple to understand and adopt respectively whereas, 17.19% and 14.06 % are undecided about the statements but 12.5% and 15.62% opined that that the information provided in SHC was not simple to understand and adopt respectively. Regarding the possibility of micro nutrient management with SHC, 56.25%, 14.06% and 29.69% of respondents agree, undecided and disagree respectively with the statement. With regard to diagnosis and reclamation of problematic soils with SHC, greater part of the respondents *i.e.,* 54.69% and 51.57% agree with the same respectively but 21.88 % and 15.62 % remain undecided and 23.43% and 32.81% disagree with the statements respectively.

Table 3: Mean awareness level of benefits of SHC by the farmers (n=64).

Sr. No.	Type of perception	Frequency	Percentage
1.	Agree	38	59.52
2.	Undecided	12	18.89
3.	Disagree	14	21.59
	Total	64	100.00

As evident from the mean values in the Table 3, that majority of farmers (59.52%) agree with the benefits of soil health card recommendations, while 18.89 % of farmers remain undecided and 21.59 % disagree with the benefits of soil health card recommendations. From the above findings, it can be concluded that majority of the farmers are aware and agree with the benefits of soil health card recommendations. The reason that could be attributed for this kind of results might be that most of the farmers were much aware of about soil health cards scheme, location of soil testing laboratories and information available from soil health card report. The findings are in accordance with the findings of Archana and Balasubramanian (2019) who conducted the study on awareness, knowledge and attitude of farmers towards soil health card scheme in Tamil N du. Similar findings were obtained by Kadam *et al.* (2012).

Table 4: Adoption of Soil Health Card recommendations by the farmers (n=64).

Sr. No.	Adoption	Adopted		Not Adopted	
		Freq	%	Freq	%
1.	Recommended organic manures as per SHC results	41	64	23	36
2.	Recommended Nitrogen as per SHC results	41	64	23	36
3.	Recommended Phosphorous as per SHC results	43	67.18	21	32.82
4.	Recommended Potash as per SHC results	36	56.25	28	43.75
5.	Recommended Micro nutrients as per SHC results	37	57.82	27	42.18
6.	Recommended Gypsum/Lime as per SHC results	33	51.56	31	48.44

It could be seen from Table 4, that 64 % of farmers are adopting the recommended organic manures as per SHC results but 36% are not adopting the same. With regard to application of recommended nitrogen, phosphorous and potassium, 64%, 67.18% and 56.25% of farmers respectively are adopting but 36%, 32.82% and 43.75 % are not applying the recommended nitrogen, phosphorous and potassium respectively. Similarly, 57.82% & 51.56% are applying recommended micronutrients and gypsum/lime respectively as per the SHC results whereas, 42.18% and 48.44% are not adopting the same respectively.

It can be concluded from the mean values in the Table 5, that lion share of farmers (60.14 %) is adopting the recommendations in soil health card which can be attributed to the fact that majority of the farmers (59.52%) agree with the benefits of soil health card recommendations. regard to soil health card recommendations. Whereas, 39.86 % of farmers are not adopting the recommendations in soil health card. The findings are in agreement with the results of Chowdary *et al.* (2018).

Table 5: Mean of adoption level of farmers (n=64).

Sr. No.	Level of Adoption	Frequency	Percentage
1.	Adoption	38.5	60.14
2.	Non-Adoption	25.5	39.86
	Total	64	100.00

Table 6: Relationship between selected personal, socio, economic characteristics of farmers and their awareness and adoption of soil health card recommendations.

Sr. No.	Variable	Correlation Co-efficient 'r' value	
		Awareness	Adoption
1.	Age	0.21	0.03
2.	Education	0.14	0.10
3.	Experience in farming	0.18	0.01
4	Size of holding	0.06	0.11
5	Annual income	-0.03	-0.01
6	Sources of information	0.07	0.26
7	Family size	-0.08	-0.08
8	Family type	-0.10	0.02
9	Social participation	0.12	0.01
10	Extension contacts	0.35	0.41

From Table 6, it was evident that the computed 'r' value between Age, Education, Experience in farming, Size of holding, Sources of information, social participation and Extension contact shows non – significant positive correlation with awareness of farmers about soil health card recommendations, whereas Annual income, Family size and family type were found non – significant negative correlation with awareness of soil health card recommendations among farmers.

Further from Table 6, it was clear that the computed 'r' values of education, Age, Education, Experience in farming, Size of holding, Sources of information, family type, social participation and Extension contact depicts non – significant positive correlation observed with adoption of soil health card recommendations, whereas Annual income and Family size were found

non – significant negative correlation with adoption of soil health cards recommendations by the farmers. Similar findings were reported by Charel *et al.* (2018).

CONCLUSION

The study revealed that the respondents were dominated by high age group, illiterates with high farming experience. The majority farmers were with small holdings and with majority were below one Lakh income. Majority were approached MAO for their information, families were nuclear in nature with below 5 family members, majority no social participation and extension contact with some times only.

Further, the majority respondents agree and adopt the benefits of soil health card recommendations. The relationship between personal, Socio – economic characteristics and their awareness and adoption of soil health card recommendations also shown non – significant relationship. Therefore, it can be concluded that the perception and adoption of soil health recommendations are on gradual rise in YSR district of Andhra Pradesh.

Conflict of Interest. None.

REFERENCES

Archana, S.S. and Balasubramanian, R. (2019). Awareness, Knowledge and Attitude of Farmers towards Soil Health Card Scheme in Tamil Nadu. *International Journal of Agriculture Sciences, 11*(9): 8405-8407.

Bangre, J., Dwivedi, A.K., Mohanty, M., Subhash, Jakhar, S. R. and Sinha, N. K. (2021). Impact of Continuous Application of Fertilizer and Organic Manure on Soil Physical Properties of a Vertisol in Central India.

Biological Forum – An International Journal, 13(2): 646-650.

Charel, J. M., V. P. Vejapara, V. S. Parmar and Baria N. 2018. Perception of Farmers about the Soil Health Card. *International Journal of Current Microbiology and Applied Sciences, 7*(02): 3233-3236.

Chowdary, R. K., Prasad, G. B. and Theodore, R. K. (2018). Soil Health Card Adoption Behaviour of Farmers in Andhra Pradesh State of India. *International Journal of Current Microbiology and Applied Sciences, 7*: 4028- 4035.

Jadav, N. B., Undhad, S. V., and Sharma, P. S. (2018). Growers knowledge and adoption of chemical fertilizer in Bt Cotton. *Journal of Krishi Vigyan. 7*(Special issue): 69-73.

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. *International Journal of Agriculture Sciences, 8*(2): 452-459.

Liu, J., Wu, L., Chen, D., Yu, Z., Wei, C., (2018). Development of a soil quality index for *Camellia oleifera* forest land yield under three different parent materials in Southern China. *Soil Tillage Research, 176*: 45–50.

Subhash, R., Monika, J., Himanshu, T., Vani, D. K. and Gupta, M. K. (2019). Study on knowledge and adoption of soil health card based fertilizer application in Khandwa district (M.P.). *International Journal of Chemical Studies, 7*(3): 3152-3155.

Veeraiah, A.(1991)Study on Adoption and dissemination of critical skills in rainfed Groundnut cultivation by the farmers trained in Krishi Vigyan Kendra in Anantapur district of Andhra Pradesh. M.Sc.(Ag) Theses, Andhra Pradesh Agricultural University, Rajendranagar, Hyderabad.

Xue, R., Wang, C., Liu, M., Zhang, D., Li, K., & Li, N. (2019). Anew method for soil health assessment based on Analytic Hierarchy Process and meta-analysis. *Science of the Total Environment, 650*: 2771-2777.

How to cite this article: A. Veeraiah, C. Prathyusha, V. Shilpakala, S. Ramalakshmi Devi and B. Padmodaya (2022). A Survey on Awareness and Adoption of Soil Health Card (SHC) Recommendations by the Farmers in YSR District of Andhra Pradesh. *Biological Forum – An International Journal, 14*(2): 1152-1156.

.