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# Socio-Economic Factors Affecting the Perception of Farmers towards Soil Health Card (SHC) Scheme in Rayalaseema Region of Andhra Pradesh

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***Authors' contributions***

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## ABSTRACT

Soil is an important component of farming since it delivers nutrients to the plants. Soil health is critical for ensuring long-term agricultural production. "National Mission for Sustainable Agriculture (NMSA) was implemented during 12$^{th}$ Plan with the objective of making agriculture more productive, sustainable and climate resilient. Conserving natural resources, to adopt comprehensive soil health management practices and optimize utilization of water resources are also objectives of NMSA. As a part of comprehensive soil health management Soil Health Card (SHC) scheme was started by the Department of Agriculture & Co-operation under the Ministry of Agriculture and Farmers' Welfare. Soil test-based nutrient management has emerged as a key issue in efforts to increase agricultural productivity and production, because optimal nutrient use, based on soil analysis, can improve crop productivity and minimize wastage of these nutrients, minimizing environmental impact and leading to bias through optimal production. Governments do efforts towards these through Soil Health Cards. The present study was conducted in Anantapuramu district of Andhra Pradesh in view of assessing the socio economic factors influencing the perception level of the farmers on Soil

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Health Card scheme. Results revealed that there was a positive and significant relationship of perception towards SHC scheme with respect to education, land holding, mass media exposure, social participation, extension contact, scientific orientation, economic motivation, risk orientation, innovativeness, management orientation and achievement motivation at 0.01%level of significance, where as cropping intensity at 0.05 %level of significance. Farming experience and family type had a negative and non-significant association with farmers' perceptions of the SHC scheme, whereas age and yearly income had a positive and non-significant relationship with farmers' perceptions of the system.

*Keywords: Achievement motivation; multiple linear regression perception; soil health card.*

## 1. INTRODUCTION

Healthy soils with wide recognized function of supporting food production forms the foundation for food system. Soils are the cornerstone of agriculture and provide a growing substrate for practically all food-producing plants. It is estimated that 95 percent of our food is produced on our soils, either directly or indirectly. Soils also protect sensitive plant roots from harsh temperature changes. Healthy soils produce healthy crops that in turn nourish people and animals which assure that soil quality is directly linked to food quality and quantity. Soil quality can be defined as the fitness of a specific kind of soil, to function within its capacity and within natural or managed ecosystem boundaries, to sustain plant and animal productivity, maintain or enhance water and air quality, and support human health and habitation [1, 2]. The functional capacity of a soil to sustain the natural productivity, environmental quality, and promotes plant and animal health within the ecosystem is called soil health [3]. Agriculture in India accounts for a considerable amount of India's economic development, as it provides food for more than 1.2 billion people and total employment to about 54.6% [4] of the population. It has been estimated that due to rapid urbanization, per capita consumption of food grain in India will decrease from 14.4 to 12.7 kg per month over the next 50 years. However, total food grain demand is projected to increase from 16.7 to 19.9 kg per month over the next 50 years due to increased demand for feed grain. The total grain demand will increase from 201 million tonnes in 2000 to about 291 and 377 million tonnes by 2025 and 2050, respectively.

The spectacular success in food grain production and nutrition has been achieved through a combination of factors, including the entrepreneurial spirit of 14 crore farmers, the various farmers' welfare and productivity-enhancing policies of the Central and state governments, and the role played by stakeholders in quality Agri-inputs such as seeds, pesticides, weedicides, fertilizers, Agri-marketing, and Agri-processing sectors [5]. Despite of these achievements the soil health is deteriorating parallely due to Extractive farm practices such as higher use of chemicals and burning of crop residues are degrading Indian soil and jeopardizing the health of its citizens, says Rattan Lal, soil scientist, and winner of the 2020 World Food Prize. Hence the Department of Agriculture & Co-operation under the Ministry of Agriculture and Farmers' Welfare, Government of India introduced a new scheme with an aim of improving the health of the soil 'The Soil Health Card Scheme' (SHC) on 17$^{th}$ February 2015. The aims of the scheme it to promote soil test based and even-handed use of fertilizers to enable farmers to get hold of higher yields at lower cost. Also the main objective of the scheme was to analyse the nutrient of the soil and recommend the correct amount of fertilizer required. Keeping in view of the importance of Soil Health Card Scheme the present study was carried out with objective of assessing the perception level of farmers regarding Soil Health Card Scheme (SHC) and socioeconomic factors affecting the perception level of the Soil Health Card Scheme (SHC).

## 2. MATERIALS AND METHODS

The study was carried out in 2019-2020 in Anantapur district of Rayalaseema region of Andhra pradesh. Ananthapuram district was selected from Rayalaseema region because it consisted of wide variety of soils and wide variety of crops (Agriculture, Horticulture) being cultivated which provides scope to assess the perception of diversified farmers. The supply of soil health cards was higher in Ananthapuram district when compared to other districts of Rayalaseema region. The current status of soil health card distribution in Anantapur district are soil sample target was 52044,soil samples

collected and tested- 31824 and number of farmers covered are 68092. Ex-post-facto research design was followed for carrying out the study. Six mandals with highest number of soil health card holders from Anantapuramu district were selected randomly for study namely Raptadu, Kanekal, Tadipatri, Gudibanda, Dharmavaram, and Gorantla. Two villages were selected from each of the 6 mandals by following simple random sampling thus making a total of 12 villages. From each village, 20 farmers possessing soil health cards were selected by following simple random sampling procedure, which made a total of 240 respondents for the study. The statistical tools used for the above study were Frequencies and Percentages, Arithmetic Mean (X), Standard deviation (σ), Karl Pearson's coefficient of correlation and Regression Analysis. The data collection was done by personal interview method with help of well prepared interview schedule.

## 3. RESULTS AND DISCUSSION

A bird eye view of the table revealed that there was no any significant difference between age and level of perception about SHC scheme. The probable reason may be the good education level made SHC beneficiaries perceive the information given in the SHC. Education level of SHC beneficiaries had positive and significant association with level of perception. In fact education can increase the perceptive ability of a farmer which make SHC beneficiary easily perceive the scientific facts present in soil health card.

Family type had negative and non significant association with level of perception towards SHC scheme. Farming experience did not any exert significant association with level of perception towards SHC scheme. The reason behind this no association is that perception is mainly influenced by education level where the beneficiaries had good education levels which made them perceive well which doesn't require any farming experience. Land holding had positive and significant association with the level of perception about SHC scheme. The plausible reason for the above result might be that, majority of SHC scheme farmers had medium to semi medium land holding and they always look way ahead to reduce the expenditure on fertilizers which share major proportion in overall input costs. Hence, farmers with large land holdings show eagerness in utilizing the SHC scheme. So the perception of farmers towards SHC scheme obviously was at high level.

Annual income had no significant association with level of perception about SHC scheme. Cropping intensity had positive and significant association with level of perception towards SHC scheme. The plausible reason behind the above association is that, generally as the number of crops cultivated per annum increases planning of farmers for crop production also increases. Hence, farmer always strive to gain more profits

**Table 1. Relationship between the selected profile characteristics of farmers with perception towards SHC scheme (n=240)**

| S. No | Independent variables | Correlation coefficients ('r' values) |
|---|---|---|
| 1 | Age | $0.005^{NS}$ |
| 2 | Education | $0.190^{**}$ |
| 3 | Family type | $-0.049^{NS}$ |
| 4 | Farming experience | $-0.070^{NS}$ |
| 5 | Land holding | $0.234^{**}$ |
| 6 | Annual income | $0.013^{NS}$ |
| 7 | Cropping intensity | $0.197^{**}$ |
| 8 | Mass media exposure | $0.224^{**}$ |
| 9 | Social participation | $0.306^{**}$ |
| 10 | Extension contact | $0.266^{**}$ |
| 11 | Scientific orientation | $0.265^{**}$ |
| 12 | Economic motivation | $0.291^{**}$ |
| 13 | Innovativeness | $0.221^{**}$ |
| 14 | Risk orientation | $0.271^{**}$ |
| 15 | Management orientation | $0.189^{**}$ |
| 16 | Achievement motivation | $0.351^{**}$ |

**: Significant at 0.05 level of probability, **: Significant at 0.01 level of probability NS: Non Significant*

with less expenditure on inputs. One major pathway to reduce expenditure on inputs is to minimize expenditure on fertilizers which is possible only by following recommendations as prescribed in soil health card. Hence, farmers show keen interest towards soil testing which ultimately increased the perception level towards SHC scheme.

Mass media exposure exerted positive and significant association with level of perception towards SHC scheme. Through mass media farm information can be effectively disseminated to farmers there by, farmers are able to perceive easily the latest technical know-how and apply them in their own conditions. Hence farmer's high level of mass media exposure will obviously have good perception levels of latest advances in agriculture. Social participation had positive and significant association with level of perception about SHC scheme. Farmers who participate in different social organizations as member or office bearer come across various types of people and exchange their views, ideas and opinions there by finding appropriate solution to their problems. Extension contact had positive and significant interaction with level of perception towards SHC scheme. Farmers who frequently contact extension functionaries get appropriate solutions to the problems; on the other hand they gain knowledge regarding advancements, programmes/schemes, modern innovations and technologies thereby increasing the perception levels towards modern technologies.

Scientific orientation had positive and significant interaction with level of perception towards SHC scheme. Farmers who possess high scientific orientation always think about the available scientific recommendations to implement them in their own prevailing conditions. Hence, farmers in view of reducing the expenditure on fertilizers they think for following the recommendations as prescribed in SHC. Thereby, they increase the perception levels towards SHC scheme by gathering the pertinent information related to soil health card scheme.

Economic motivation exerted positive and significant interaction with level of perception towards SHC scheme. Farmers who are economically motivated set high goals and strive to reach the set goals to become economically sound and stable are always eager to use modern technologies and reduce the input costs. SHC scheme farmers with high risk bearing capacity, high educational qualification, extension participation and more profit seeking behavior always gain pertinent knowledge and ultimately possess higher perception regarding SHC scheme, which made the association positive and significant.

Innovativeness exerted positive association with level of perception towards SHC scheme. Generally farmers with more innovativeness would be looking for new ideas and gain more knowledge pertaining to those new ideas where as SHC scheme farmers with good level of innovativeness had perceived the usefulness of information given in soil health card for better soil health.

Risk orientation, Management orientation and Achievement motivation exerted positive and significant interaction with level of perception towards SHC scheme. In the present study majority of SHC scheme farmers had good achievement motivation and they are well motivated in trying out new ideas. In order to take risk they always try to obtain as much information as possible and increase their perception levels. Majority of SHC scheme farmers perceived the usefulness of SHC which does not involve any risk or adverse effect in adoption of the prescribed recommendations given in SHC.

### 3.1 MLR

Multiple Linear Regression (MLR) was carried out to determine the combined effect of all the selected profile characteristics of soil health card scheme farmers in explaining perception of farmers towards soil health card scheme. Regression was run on SPSS 20.0. The model given below was arrived with the step wise regression equation as follows.

Y = 33.207+ 0.086X1+0.833** X2 -0.270 X3-0.099 X4 +0.752* X5- 0.018 X6 + 0.006X7 +0.212 X8+0.148* X9+0.357X10+0.012 X11+0.377* X12+0.158 X13+0.403 X14-0.062 X15+0.0465* X16

The 'R2' value of 0.627 depicted that all the selected sixteen profile characteristics collectively explained about (62.70%) variation in perception of farmers towards SHC scheme. From Table 2 it can be revealed that, variables namely education, land holding, social participation, economic motivation and achievement motivation alone were the important variables in influencing the perception of farmers towards SHC scheme. Farmers with good

**Table 2. Step wise regression analysis of the selected independent variables with Perception about SHC scheme (n=240)**

| S.No. | Variable number | Independent variables | (b) | Beta coefficient | Computed 't' values |
|---|---|---|---|---|---|
| 1 | $X_1$ | Age | 0.086 | 0.111 | 1.312 |
| 2 | $X_2$ | Education | 0.833 | 0.161 | 2.775** |
| 3 | $X_3$ | Family type | -0.270 | -0.015 | -.274 |
| 4 | $X_4$ | Farming experience | -0.099 | -0.089 | -1.066 |
| 5 | $X_5$ | Land holding | 0.752 | 0.198 | 3.383* |
| 6 | $X_6$ | Annual income | -0.018 | -0.028 | -.457 |
| 7 | $X_7$ | Cropping intensity | 0.006 | 0.036 | .641 |
| 8 | $X_8$ | Mass media exposure | 0.212 | 0.070 | 1.158 |
| 9 | $X_9$ | Social participation | 0.148 | 0.118 | 2.017* |
| 10 | $X_{10}$ | Extension contact | 0.357 | 0.140 | 2.248 |
| 11 | $X_{11}$ | Scientific orientation | 0.012 | 0.005 | .071 |
| 12 | $X_{12}$ | Economic motivation | 0.377 | 0.162 | 2.248* |
| 13 | $X_{13}$ | Innovativeness | 0.158 | 0.060 | .991 |
| 14 | $X_{14}$ | Risk orientation | 0.403 | 0.154 | 2.114 |
| 15 | $X_{15}$ | Management orientation | -0.062 | -0.046 | -.672 |
| 16 | $X_{16}$ | Achievement motivation | 0.465 | 0.155 | 2.565* |

**: Significant at 0.05 level of probability **: Significant at 0.01 level of probability NS: Non Significant*

education level will always perceive the information prescribed in soil health card easily. Larger the land holding more is the interest in technologies which reduces the input cost. Hence farmers with larger land holding are very keen in testing their soils prior to application of fertilizers and follow the recommendations prescribed in soil health card. Higher the social participation, achievement motivation and economic motivation higher the interest in utilizing the modern scientific technologies to become sustained with regards to production, productivity and income obtained from farming activities.

## 4. CONCLUSION

The study of socio-economic factors influencing farmers' perceptions of the Soil Health Card (SHC) Scheme in Andhra Pradesh's Rayalaseema region revealed that there was a positive and significant relationship between perceptions of the SHC scheme and education, land holding, mass media exposure, social participation, extension contact, scientific orientation, economic motivation, risk orientation, innovativeness, management orientation, and achievement motivation. Farming experience and family type had a negative and non-significant link with farmers' perceptions of the SHC scheme, whereas age and yearly income had a positive and non-significant relationship. The results of MLR revealed that all the selected sixteen profile characteristics collectively explained about (62.70%) variation in perception of farmers towards SHC scheme. Hence the variables which shown the positive association should be mainly concentrated to increase the awareness and perception of the farmers regarding the Soil Health Card scheme and the benefits of Recommendation based application of the fertilizers.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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