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Adoption of Carbon Sequestration in Rice and Sugarcane Based Farming System in Southern Dry Zone of Karnataka

D. K. Suresh, N. T. Naresh and B. Divya
ICAR - Krishi Vignana Kendra, V.C. Farm, Mandya - 571 405
e-Mail : suri1775@gmail.com

Authors Contribution

D. K. Suresh : Conceptualization, conducting experiment; N. T. Naresh : Supervision and guidance; B. Divya : Data collection and assistance in data analysis

Corresponding Author :
D. K. Suresh
Krishi Vignana Kendra,
V. C. Farm, Mandya

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Abstract

The present investigation was carried out in Mandya, Mysore and Chamarajnagara districts of Karnataka state. One hundred eighty farmers who are practicing rice and sugarcane based farming system were included in the study. Totally 180 respondents were randomly selected from Maddur and Mandya taluks of Mandya district, Nanjanagudu and T. Narasipura taluks of Mysore district and Kollegala and Yelandur taluks of Chamarajanagar districts for the present investigation. Results revealed that nearly half (43.33%) of the respondents had not adopted carbon sequestration technologies in rice based farming system and 42.22 per cent of the respondents had moderately adopted carbon sequestration technologies in sugarcane based farming system. The study also indicated that among the fifteen technologies 'Green manuring and 'Application of FYM' have got higher mean adoption score of 2.00 and 1.98, on the other hand technologies like organic farming and 'Site Specific Nutrient Management in rice farming' were least adopted with mean adoption score of 1.13 and 1.0 in rice farming. Results of the study interpreted those technologies *viz.,* 'Vermicomposting', 'Application of FYM' and 'Green manuring' which were highly ranked with 1.96 and 1.94 mean adoption score respectively and contrary to this 'Site Specific Nutrient Management sugarcane farming', practicing 'Agro-Forestry' and 'Organic Farming' had got lower mean adoption score of 1.18, 1.27 and 1.34, respectively

Keywords : Adoption, Carbon sequestration, Mean attitude score, Rice & sugarcane farming, Farming

Climate change is a change in the statistical distribution of weather patterns when that change lasts for an extended period of time (*i.e.,* decades to millions of years). Climate change may refer to a change in average weather conditions, or in the time variation of weather around longer-term average conditions. Conservation agriculture (CA) is a holistic approach of crop production (Venkateswarlu *et al*., 2009) and a viable alternative to current crop production system which is sustainable, technically successful and economic (Derpsch and Friedrich, 2009). CA technique provides equal or more productivity, improves soil health and higher farm profitability in sustainable way in compared to conventional practice (Jat *et al.,* 2009). Former researchers in this reason (Regmi *et al.* 2003), (Ghimere *et al.,* 2012) suggested the further researches to conclude about Soil Organic Carbon (SOC) sequestration in rice-wheat system under conventional and conservation agriculture. Therefore, with the aforementioned situation, aspects and needs, research was conducted to find out the SOC sequestration in the rice-wheat system under conventional and conservation agriculture.

Carbon sequestration is considered as a leading technology for reducing carbon dioxide (CO_2) emissions from fossil-fuel based electricity generating

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power plants and could permit the continued use of coal and gas while meeting greenhouse gas targets. India is one of the world's largest emitters of CO_2. Considering the dependence on health of the Indian global economy, there is an imperative need to develop a global approach that could address the capturing and secure storing of carbon dioxide emitted from an array of energy. Therefore technology such as carbon sequestration will deliver significant CO_2 reductions in a timely fashion. Considerable energy is required for the capture, compression, transport and storage steps. With the availability of potential technical storage methods for carbon sequestration like forest, mineral and geological storage options with India, it would facilitate achieving stabilization goals in the near future.

Any production system will survive only when it is supplemented with basic quality critical inputs like seed/ breed or species and disease resistant varieties with low price. So, government schemes must reach the farmers to supplement the inputs at right time, at right place and right quantity. With this background, this study has been designed to understand the attitude of farmers towards carbon sequestration technologies in rice and sugarcane based farming systems. The study with the following specific objectives, was conducted

1. To analyze the profile of farmers in rice and sugarcane based farming system
2. To assess the adoption of carbon sequestration technologies in rice and sugarcane based farming system.

Methodology

The present investigation was carried out in Mandya, Mysore and Chamarajanagara districts of Karnataka state. One hundred Eighty Farmers who are practicing rice and sugarcane based farming system were included in the study. Included 180 respondents randomly selected from the Maddur and Mandya taluks of Mandya district, Nanjanagudu and T. Narasipurataluks of Mysore district and Kollegala and Yelandurtaluks of Chamarajanagar districts for the present investigation. Ex post facto research design was employed for conducting the study. Data was collected by using a detailed interview schedule and employed personal interview method. The responses were scored, quantified, categorized and tabulated using statistical methods like percentage, mean, standard deviation and multiple regression.

Operational Definition : Adoption is the extent of use of the recommended technologies of carbon sequestration by farmers in rice and sugarcane based farming system.

Results and Discussion

Profile of the Farmers Selected for the Study

The data presented in Table 1 projects the profile of farmers in rice and sugarcane based farming

Table 1

Profile of the farmers in rice-sugarcane farming system

(n=180)

Characters	Category	No.	(%)
Age	Young	10	5.56
	Middle	135	75.00
	Old	35	19.44
Education	Illiterate	08	04.44
	Can read and write only	10	05.56
	Primary school	35	19.44
	Higher primary school	55	30.56
	High school	46	25.56
	PUC	22	12.22
	Graduate	04	02.22
	Post Graduate	08	4.44
Occupation	Main	47	26.11
	Subsidiary	133	73.89
Type of family	Nuclear	97	53.89
	Joint	83	46.11
Family size	Small	69	38.33
	Medium	75	41.67
	Big	36	20.00

Table 1 Contd....

Characters	Category	No.	(%)
Land holding	Marginal	60	33.33
	Small	60	33.33
	Big	60	33.33
Annual income	Low	58	32.22
Mean = 2.97	Medium	70	38.89
SD = 1.76	High	52	28.89
Social participation	Low	49	27.22
Mean = 16.96	Medium	67	37.22
SD = 2.57	High	64	35.56
Mass media exposure	Low	44	24.44
Mean = 9.14	Medium	70	38.89
SD = 1.58	High	66	36.67
Extension contact	Low	44	24.44
Mean = 14.37	Medium	70	38.89
SD = 2.24	High	66	36.67
Scientific orientation	Low	61	33.89
Mean = 18.39	Medium	67	37.22
SD = 2.01	High	52	28.89
Achievement motivation	Low	50	27.78
Mean = 21.58	Medium	58	32.22
SD = 2.39	High	72	40.00
Risk Orientation	Low	65	36.11
Mean = 22.22	Medium	56	31.11
SD = 2.45	High	59	32.78
Management orientation	Low	44	24.44
Mean = 14.39	Medium	70	38.89
SD = 1.74	High	66	36.67
Cosmpoliteness	Low	47	26.11
Mean = 22.35	Medium	48	26.67
SD = 2.42	High	85	47.22
Farming Experience	Low	44	24.44
Mean = 3.27	Medium	65	36.11
SD = 1.06	High	71	39.44
Innovative Proneness	Low	61	33.89
Mean = 18.50	Medium	50	27.78
SD = 2.30	High	69	38.33
Material Possession	Low	51	28.33
Mean = 11.86	Medium	54	30.00
SD = 2.77	High	75	41.67
Deferred Gratification	Low	59	32.78
Mean = 23.98	Medium	67	37.22
SD = 3.91	High	54	30.00

system comprising of different personal and socio-psychological characteristics. This is an attempt to document the background of the selected respondents, which facilitate to understand and interpret the awareness, attitude and adoption of carbon sequestration technologies in rice and sugarcane based farming system. Also, a brief discussion on these aspects is dealt with in the following paragraphs.

Three fourth (75.00%) of the respondents belonged to middle aged category. It was noticed that lesser than one-third (30.56%) of the respondents had completed higher primary schooling, majority (73.89%) of the respondents were involved in farming along with subsidiary enterprises, the study found that more than half (53.89%) of the respondents belonged to nuclear family and rest (46.11%) of the respondents belonged to joint family, A greater proportion (41.67%) of the respondents belonged to medium sized family with 3-6 members, regarding land holding, all three types of farmers such as marginal, small and big were equally distributed (33.33%) each, with respect to annual income, majority of the farmers belonged to medium level of (38.89%) annual income groups, it was noticed that more than one-third (37.22%) of the respondents belonged to medium level of social participation, as far as mass media exposure is concerned, more than one-third (38.89%) of the farmers belonged to medium mass media exposure, the study found that a larger number (38.89%) of the respondents belonged to medium extension contact category, with respect to scientific orientation greater proportion (37.22%) of respondents belonged to medium level of scientific orientation category, it was revealed that higher proportion (40.00%) of the respondents belonged to high level of achievement motivation category, more than one-third (36.11%) of respondents belonged to low level of risk orientation category, greater proportion (38.89%) of respondents belonged to medium level of management orientation category, nearly half (47.22%) of the respondents had high level of cosmopoliteness, nearly four-tenth (39.44%) of respondents belonged to high level of farming experience category, larger proportion (38.33%) of

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the respondents belonged to high innovative proneness category, more than four-tenth (41.67%) of the respondents possessed high level of materials possession, more than one third (37.22%) of the respondents belonged to medium level of deferred gratification category.

The possible results might be that the farmers of middle aged group were enthusiastic and had more work efficiency. Moreover, these people have more family responsibility and sensibility. They also work with a sense of commitment and involvement. Agriculture being the most predominant occupation in the study area, most of the farmers were following agriculture for more than 20 years. The growing urbanization might have influenced the farmer to prefer nuclear families which could satisfy the basic needs of the family for better harmony. A family with more members can easily adapt the carbon sequestration technologies in rice and sugarcane production. They have to plan, produce and market the output under different circumstances and they have to strive hard to get maximum profit from the farm and other enterprises. Farmers having good scientific orientation and innovative proneness always want to try new ideas new techniques/technologies in farming. So, when farmers were trying new technologies reflected the capacity to take high risks in farming by minimizing inputs cost and maximizing profits. This finding is in line with the findings of Swaroop (2005), Hiremath (2007), Shankara (2010), Ravindra Jamadar (2012), Mamathalakshmi (2013), Muttanna (2013), Sahana (2013), Chaithra (2014), Suresh (2014), Dutta Bibhu Prasad (2015), Sunitha (2015), Vinaykumar (2015) and Yashashwini (2016).

Over all Adoption of Carbon Sequestration Technologies by Farmers in Rice Farming

It is evident from the Table 2 that, nearly half (43.33%) of the respondents had not adopted carbon sequestration technologies in rice based farming system followed by respondents who moderately (35.56%) and fully adopted (21.11%) the carbon sequestration technologies, respectively.

TABLE 2

Over all adoption of carbon sequestration technologies by farmers in rice farming

(n=180)

Adoption category	Number	Per cent
Fully adopted	38	21.11
Moderately adopted	64	35.56
Not adopted	78	43.33
Total	180	100

Mean : 26.47; SD : 3.11

The probable reason for this kind of result may be that the majority of the farmers practicing rice and sugarcane based farming system weren't able to practice micro irrigation techniques, organic farming, agro forestry, cultivation of aerobic rice and practicing of System of Rice Intensification (SRI) in their field. The farmers belonging to the moderately adopted category were practicing integrated nutrient management, green manuring and green leaf manuring and application of vermicompost.

Adoption of Carbon Sequestration Technologies by Farmers in Rice Farming

The statement-wise adoption of carbon sequestration technologies by farmers in rice farming is presented in Table 3. The statements which are in top order were 'Green manuring' obtained a mean adoption score of 2.00 and was accorded the first rank by the farmers. The statement 'Application of FYM' received a score of 1.98 and was ranked second. The statement 'Use of microbial consortia' obtained a mean adoption score of 1.96 and was ranked third by the farmers. The statement 'Application of neem coated urea' was ranked fourth with a mean adoption score of 1.94 and the statement 'Vermicomposting' was ranked fifth with a mean adoption score of 1.88.

In contrast, the statements which are in bottom order were 'Organic Farming' was ranked eleven with a mean adoption score of 1.13 and the statements like 'Site Specific Nutrient Management (SSNM) in rice farming', 'Mulching of Rice straw' and 'Application

TABLE 3
Adoption of carbon sequestration technologies by farmers in rice farming

(n=180)

Carbon sequestration technologies	Mean adoption score	Rank
Green manuring	2.00	I
Application of FYM	1.98	II
Use of microbial consortia	1.96	III
Application of neem coated urea	1.94	IV
Vermicomposting	1.88	V
Integrated Nutrient Management	1.71	VI
Reduced tillage in rice farming	1.30	VII
Agro-Forestry	1.23	VIII
Aerobic rice cultivation	1.20	IX
Practicing of SRI (System of Rice Intensification)	1.18	X
Organic Farming	1.13	XI
Micro irrigation techniques in rice farming	1.00	XII
Site Specific Nutrient Management in rice farming	1.00	XII
Mulching of Rice straw	1.00	XII
Application of water soluble fertilizers	1.00	XII

of water soluble fertilizers' was shared a common rank twelve with a mean adoption score of 1.00 respectively.

The probable reasons for this type of result might be the farmers are not much aware of the technologies like SSNM, SRI method of paddy cultivation, aerobic rice cultivation, because of abundant availability of irrigation water in the cultivated area and also the availability of inputs in terms of seed material and also low technical know-how about these technologies. Green manuring is being adopted by the farmers because of the availability of green leaf manures. Majority of the farmers had subsidiary enterprises like dairy, sheep and goat rearing. So, they are using paddy straw as the feed for those enterprises. The farmers getting FYM as the output of subsidiary enterprises are very much aware about the use of vermicomposting in maintaining the soil fertility and getting higher quality yield and nowadays in the market urea is available with neem coated for slow release of nutrients and farmers have adopted this technology fully.

Over all Adoption of Carbon Sequestration Technologies by Farmers in Sugarcane Farming

An examination of Table 4 reveals that about 42.22 per cent of the respondents had moderately adopted carbon sequestration technologies in sugarcane based farming system followed by respondents who had not adopted (32.78%) and those who had fully adopted (25.00%) the carbon sequestration technologies respectively.

TABLE 4
Over all adoption of carbon sequestration technologies by farmers in sugarcane farming

(n=180)

Adoption category	Number	Per cent
Fully adopted	45	25.00
Moderately adopted	76	42.22
Not adopted	59	32.78
Total	100	100

Mean: 33.18; SD: 3.78

The reasons for this type of results might be due to that, because some of the farmers practicing rice and sugarcane based farming system are practicing micro irrigation techniques and organic farming moderately and many of them are practicing trash mulching in sugarcane field and application of neem coated urea. Further, the farmers who belonged to 'not aware' category faced the scarcity of agricultural laborers, resulting in some of the farmers not practicing trash mulching,chemical method of weed control and agro-forestry in their sugarcane fields. One-fourth of the farmers belonged to 'fully adopted' category of carbon sequestration technologies due to application of neem coated urea, vermicomposting and integrated nutrient management.

Adoption of Carbon Sequestration Technologies by Farmers in Sugarcane Farming

The statement-wise adoption of carbon sequestration technologies by farmers in sugarcane farming is

TABLE 5
Adoption of carbon sequestration technologies by farmers in sugarcane farming

(n=180)

Carbon sequestration technologies	Mean score	Rank
Vermicomposting	1.96	I
Application of FYM	1.94	II
Green manuring	1.94	II
Application of neem coated urea	1.93	III
Trash incorporation (sugarcane)	1.89	IV
Integrated Nutrient Management	1.86	V
Stubble incorporation in sugarcane	1.83	VI
Use of microbial consortia	1.78	VII
Crop rotation with pulses in sugarcane	1.67	VIII
Micro irrigation techniques in sugarcane cultivation	1.61	IX
Reduced tillage in sugarcane farming	1.47	X
Weed management through cover crops in sugarcane	1.39	XI
Application of water soluble fertilizers	1.36	XII
Organic Farming	1.34	XIII
Agro-Forestry	1.27	XIV
Site Specific Nutrient Management sugarcane farming	1.18	XV

presented in Table 5. It is seen from Table 5 that, among the sixteen statements, the statements which are in top order were 'Vermicomposting' that obtained a mean adoption score of 1.96 and was accorded the first rank by the farmers. The statements 'Application of FYM' and 'Green manuring' received an equal score of 1.94 and were ranked second. The statement 'Application of neem coated urea' obtained a mean adoption score of 1.93 and was ranked third by the farmers. The statement 'Trash incorporation' was ranked fourth with a mean adoption score of 1.89 and the statement 'Integrated Nutrient Management' was ranked fifth with a mean adoption score of 1.86.

In contrast, the statements which are in bottom order were 'Organic Farming', which was ranked thirteen with a mean adoption score of 1.34 and the statements like 'Agro-Forestry' was ranked fourteen with a mean adoption score of 1.27 and 'Site Specific Nutrient Management in sugarcane farming' was ranked fifteen with a mean adoption score of 1.18.

The farmers practicing sugarcane farming system are not practicing many of the carbon sequestration technologies because the technologies like SSNM need technical competence and knowledge about SSNM. Due to fragmented land holdings, they weren't able to practice agro-forestry and due to lack of marketing facilities and lower production in organic farming, majority of them were not adopting the carbon sequestration technologies. Their farming experience and availability of farm inputs and FYM guided them for adoption of FYM application, vermicomposting and integrated nutrient management in farming. They are aware about the advantages of practicing of trash incorporation and thus, they are adopting the trash mulching in their field.

Relationship between Independent Variables and Adoption towards Carbon Sequestration Technologies in Rice and Sugarcane based Farming System

The relationship between independent variables with adoption towards carbon sequestration technologies is described in the Table 6.

It could be observed from the results that 16 out of 19 variables were found to have significant relationship with adoption. The independent variables such as age, education, occupation, land holdings, annual income, mass media exposure, Scientific orientation, Risk orientation, Management orientation, Cosmo-politeness, farming experience, innovative proneness and Material possession had positive and significant relationship with adoption at one per cent level. Similarly, Social participation, Extension contact and Achievement motivation had positive and significant relationship with adoption at five per cent level. The remaining variables *viz.,* type of family, family size, Material possession and Deferred gratification

TABLE 6

Relationship between independent variables of farmers and adoption towards carbon sequestration technologies in rice and sugarcane based farming system

(n=180)

Profile of farmers	Correlation coefficient 'r' values
Age	0.258 **
Education	0.269 **
Occupation	0.392 **
Type of family	0.128 NS
Family size	0.081 NS
Land holding	0.368 **
Annual income	0.268 **
Social participation	0.081 *
Mass media exposure	0.312 **
Extension contact	0.369 *
Scientific orientation	0.412 **
Achievement motivation	0.192 *
Risk orientation	0.255 **
Management orientation	0.261 **
Cosmopoliteness	0.268 **
Farming experience	0.269 **
Innovative proneness	0.368 **
Material possession	0.278 **
Deferred gratification	0.092 NS

*Significant at 5 per cent level; **Significant at 1per cent level; NS= Non significant

non-significant relationship with adoption. The possible reasons for the independent variables having a significant relationship with adoption are given in following paragraphs.

Age and Adoption

Based on the results, one can predict that farmers, who are middle aged, are enthusiastic to try and know the changes in their surroundings. Also, as the age of farmers increases their mental makeup ability makes them to adopt the technologies of carbon sequest ration in their farming. The maturity of mind might have made the adoption of carbon sequestration technologies a possibility.

Education and Adoption

Education is a basic element for human development. The education level of farmers was found to be positively and significantly related with their adoption level of carbon sequestration technologies in rice and sugarcane based farming system. Education plays a vital role in getting knowledge and understanding of the information on carbon sequestration.

Occupation and Adoption

The results revealed that occupation had significant relationship with the adoption level of farmers. Occupation is the factor which can support the farmers in terms of providing needful inputs to adoption of the carbon sequestration technologies. Because of support received from the subsidiary occupations, farmers can effectively adopt the new carbon sequestration technologies.

Land Holding and Adoption

Higher land holdings provide farmers with an opportunity to think of many alternative courses of action and also higher resource possession attached to higher holdings aid farmers to take appropriate actions at right time. Further, the economic statuses of farmers are generally linked with higher operational holdings. Thereby, a farmer with higher holdings can try the new carbon sequestration technologies in rice and sugarcane based farming system.

Annual Income and Adoption

The possible reason for the significant relationship of annual income with adoption may be due to the higher income level of the farmers which aid them to start the application of carbon sequestration technologies in rice and sugarcane based farming system. Many of the carbon sequestration technologies are cost oriented. Hence, the higher level of income supported the farmers to adopt the carbon sequestration technologies.

Social Participation and Adoption

The possible reason for the significant relationship between social participation and adoption is due to

opportunity of exposure and discussion with others who motivate them to adopt the useful and eco-friendly carbon sequestration technologies in their farming.

Mass Media Exposure and Adoption

Mass media makes available the necessary information, thus influencing their adoption level. Further, therefore, in view of this functional role of mass media the farmer's exposure to mass media would help them to acquire information regarding carbon sequestration technologies in their farming. The success stories broadcasted on the use of carbon sequestration technologies in the media were also a reason for the adoption of carbon sequestration technologies in the farming.

Extension Contact and Adoption

A positive and significant relationship was noticed between extension contact and the adoption of carbon sequestration technologies by farmers. The possible reasons might be that farmers who have frequent extension agency contacts happen to be guided by the ideas on carbon sequestration in agriculture. Education and income along with their existing farming experience gained through increased extension agency contact that helped them to adopt the carbon sequestration technologies in rice and sugarcane based farming system.

Scientific Orientation and Adoption

The possible reasons for the significant relation between scientific orientation and adoption level of carbon sequestration technologies by farmers are the issues like need for more scientific thinking of the farmers for carbon sequestration. Greater scientific orientation made the farmers to adopt carbon sequestration technologies in rice and sugarcane based farming system.

Achievement Motivation and Adoption

The reasons pertained to the significant relation between achievement motivation and adoption level. Motivation contributes positively for performance. Thus, the psychologists have proved the significance of achievement in individual performance. Motivation built up in an individual also influences other variables which lead to higher adoption level of carbon sequestration in rice and sugarcane based farming system.

Risk Orientation and Adoption

The results depicted the significant relationship of risk orientation with adoption level of farmers. The farmers who had a higher level of risk orientation can have a better chance to adopt the scientific and new technologies like carbon sequestration in rice and sugarcane based farming. Therefore, in farming those who take at least a calculated risk perform better than others and are in line with the statement that those who are moderate risk takers are high achievers.

Management Orientation and Adoption

The results explained the significant relationship of management orientation with the adoption level of farmers. The farmers with a positive orientation towards production and market orientation have better adoption of carbon sequestration technologies in rice and sugarcane based farming system.

Cosmopoliteness and Adoption

It is well accepted that cosmpoliteness of farmer increases his contact with outside world where an individual will be exposed to new ideas and experiences of a variety of people. This interaction provides him a benefit of vicarious experience and thereby application of new ideas by the individuals would lead to higher level adoption of carbon sequestration technologies in rice and sugarcane based farming system.

Farming Experience and Adoption

It was found that farming experience had a significant relationship with adoption of carbon sequestration technologies. Higher the experience of farmers in farming, it is quite natural that the farmers might have tried all the available carbon sequestration technologies over a period of time and that leads

them towards adoption of carbon sequestration technologies.

Innovative Proneness and Adoption

There was a significant relationship between innovative proneness and the adoption of carbon sequestration technologies. This may be explained by the fact that the farmers who are prone to innovation will naturally try to adopt new carbon sequestration technologies. Thus, innovative proneness has established positive and significant relationship with the adoption level of carbon sequestration technologies by farmers.

Material Possession and Adoption

The results depicted the significant relationship with the material possession and adoption level of carbon sequestration technologies by the farmers. Eventually, the carbon sequestration technologies are dependent on the material and farm resources possessed by the farmers in their farming system.

These results were in lined with the Mcclelland (1958), Dwarkanath (1987), Satish (1990), Yogananda (1992), Vekaria *et. al.* (1993), Saxena and singh (2000) and Ranganath *et al.* (2001).

Extent of Contribution of Independent Variables to Adoption

The multiple linear regression analysis was carried out to know the extent of contribution of independent variables to their dependent variables.

The contribution of independent variables towards adoption of farmers towards carbon sequestration technologies was assessed and illustrated in the Table 7. The findings conveyed that 12 out of 19 independent variables such as education, occupation, land holding, annual income, mass media exposure, extension contact, scientific orientation, Achievement motivation, Risk orientation, Management orientation, farming experience and innovative proneness had contributed significantly towards adoption of farmers

TABLE 7

Multiple regression analysis of independent variables with Adoption towards carbon sequestration technologies in rice and sugarcane based farming system

(n=180)

Profile of farmers	Regression Coefficient	Standard error of regression co-efficient	't' values
Age	0.30	0.29	0.933 ^{NS}
Education	0.33	0.72	2.18 *
Occupation	0.26	0.68	2.61 **
Type of family	0.29	0.18	0.62 ^{NS}
Family size	0.19	0.09	0.47 ^{NS}
Land holding	0.39	0.86	2.20*
Annual income	0.28	0.56	2.00 *
Social participation	0.41	0.38	0.92 ^{NS}
Mass media exposure	0.38	0.92	2.42 *
Extension contact	0.36	0.86	2.38 *
Scientific orientation	0.28	0.81	2.89 **
Achievement motivation	0.42	0.89	2.11 *
Risk orientation	0.31	0.78	2.51 *
Management orientation	0.11	0.36	3.27 **
Cosmopoliteness	0.62	0.52	0.83 ^{NS}
Farming experience	0.16	0.36	2.25 *
Innovative proneness	0.36	0.82	2.27 *
Material possession	0.51	0.39	0.76 ^{NS}
Deferred gratification	0.42	0.20	0.47 ^{NS}

R^2 Value =0.731; *Significant at 5 per cent level; **Significant at 1per cent level; NS= Non significant

towards carbon sequestration technologies. The remaining variables had not contributed significantly towards variability in adoption. The R^2 value indicated that all the 19 independent variables had contributed to the tune of 73.10 per cent of variation in adoption of carbon sequestration technologies.

The possible reasons might be that selected profile characteristics of farmers were the deciding factors of adoption level of farmers. Similarly, both significant and non-significant contribution of independent variables had an impact on the adoption level of carbon sequestration technologies by the farmers. Hence, the null hypothesis that there is no significant relationship between independent variables and adoption was rejected.

The carbon sequestration technologies are eco-friendly and also helps the farmers to sustain the farming by adopting few organic farming techniques. farm youth and middle aged farmers were interested to adopt the carbon sequestration technologies with their higher level innovative proneness, risk orientation and scientific orientation. The farmers who are practicing rice and sugarcane based farming are not adopting the carbon sequestration technologies with evident phase due to the fragmented land holding. Adoption of carbon sequestration technologies requires greater scientific orientation. Government has to contribute for farmers to overcome the problems in adoption of carbon sequestration technologies such as: RSK's should ensure supplying of production inputs at appropriate time in the villages, followed by increasing subsidies on micro irrigation structures and support price must be given to all the crop produce based on cost of cultivation. These suggestions must be considered seriously by the departments involved in agriculture to include in the development programs and policy issues to create awareness about carbon sequestration technologies. Hence, the extension functionaries should conduct awareness programmes on carbon sequestration technologies in rice and sugarcane based farming system.

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