Profile Characteristics of the Farmers about Sustainable Practices of Redgram based Farming System

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Abstract— *The present study was conducted in Kalaburagi district of North Eastern Karnataka, during the year 2018-19. Kalaburagi district was purposively selected because the district is the pulse bowl of the state with highest area. The study was conducted in eight villages selected from four talukas of Kalaburagi district which included 30 farmers from each selected village thus making a sample of 240 farmers using random sampling method. Ex-post-facto research design was employed for conducting study. Data was collected by using a detailed interview schedule employing personal interview method and analyzed using mean, standard deviation, frequency and percentage. The analysis of profile characteristics of farmers indicated that little over half (52.50 %) of the farmers were in middle age group (31-50 years), had high school education (25.00 %), belonged to nuclear family (55.42 %), medium size of land holding (63.33 %), had more than 20 years of farming experience (55.83 %), medium annual income (42.08 %), low cropping intensity (41.25 %), medium material possession (46.67 %), low livestock possession (48.33 %), medium extension orientation (42.08 %), medium mass media utilization (42.08 %), medium level of innovativeness (52.92 %), medium level of achievement motivation (42.92 %), medium scientific orientation (47.92 %), medium risk orientation (55.42 %) and medium management orientation (41.67 %).*

Keywords— Profile characteristics, Redgram Based Farming System, Sustainable Practices.

I. INTRODUCTION

Legumes rank second in importance to cereals as human food sources because they contain protein almost comparable to what is derived from animal and fish meat. Legumes, regarded as poor man's meat, are the cheapest sources of protein among the underprivileged that cannot afford animal and fish proteins Mula and Saxena (2010). Redgram is a nutritious food being rich in protein and well-known for its usefulness in increasing soil fertility, preventing soil erosion and in suppressing weeds in upland farms. It has a wide adaptability to different climates and soils.

Redgram (*Cajanus cajan* (L) mill.sp.) is commonly known as arhar, pigeonpea, tur, togari, gango pea and no eye pea. It is an important and old crop of the country. It is the second most important pulse crop only after chickpea. Redgram is an important pulse crop grown in the tropics and subtropics. It finds important place in farming systems adopted by small holding peasants in large number of developing countries. Redgram is considered to be origin of peninsular India. It is a short annual crop in India and as a perennial in many other countries, where pods are harvested at regular interval. The crop has deep root system and hence highly drought tolerant. It is a protein rich staple food contains about 22.30 per cent protein, which is almost three times that of cereals. Redgram supplies a major share of protein, requirement of vegetarian population of the country. Redgram is mainly consumed in the form of split pulse as Dal, which is an essential supplement of cereal based diet (Nene and Sheila, 1990, Tuwafe *et al.*, 1993).

India is the largest producer, consumer and importer of redgram in the world. India occupies 79.00 per cent of world redgram area and accounts for 67.00 per cent of world production of redgram. In India, redgram occupies an area of 4.44 million hectares

and production of about 4.28 million tonnes, having a productivity of 967 kg/ha (INDIASTAT, 2017). It is mainly grown in Maharashtra, Karnataka, Madhya Pradesh, Telangana, Uttar Pradesh and Andhra Pradesh. Maharashtra (1.24 million hectares) is the leading producer of redgram followed by Madhya Pradesh (0.64 million hectares). In Karnataka, redgram is largely grown in northern parts, especially in Kalaburagi district and is called as pulse bowl of Karnataka. 'Kalaburagi Tur Dal' received Geographical Indication (GI) Tag (No. 593) from government of India during the year 2019. The state occupies an area of about 8.85 lakh hectares with the production of 7.62 lakh tonnes, having an average productivity of 861 kg/ha (INDIASTAT, 2017). Kalaburagi has an area of about 3.28 lakh hectares with production of 3.77 lakh tonnes and a productivity of 1209 kg/ha (Anonymous, 2017).

Sustainable practice encompasses the elements of productivity, profitability, health safety and the environment. Thus, sustainable practice is the need of the hour because of the urgency to develop farming techniques, which are sustainable from environments, production and socio-economic point of view. There is now an urgent demand for creative and innovative conservation and production practices that would provide farmers with economically viable and environmentally sound alternatives in their agricultural production systems Desai and Pujari, (2007). Sustainable farming is gaining momentum in India because it is adoptable and eco-friendly. Growing awareness of consumers to use safe and healthy food and need to address less effect of chemicals in agriculture production, restoration of soil health and fertility has played a key role in the emergence of sustainable agriculture sector since last two decades. Hence, it is evident that redgram crop command greater importance for attaining a better position in the world market, which would inturn contribute to our national income. At the same time, there is a need to concentrate on certain specific sustainable practices which are eco-friendly and cost effective. Since, the issues of higher cost of cultivation due to increased use of fertilizers and pesticides, decreasing trends of yield and other environmental issues are gaining paramount importance, greater emphasis is thus being laid on sustainable practices in the recent past. With this brief background the present study was conducted to know the profile characteristics of farmers about sustainable practices of redgram based farming system.

II. MATERIALS AND METHODS

The present study was conducted in Kalaburagi district of Karnataka state during the year 2018-19. Kalaburagi district was purposively selected because the district is the pulse bowl of the state with highest area. Out of seven talukas from the Kalaburagi district four talukas were selected purposively based on highest area under redgram cultivation. The talukas selected for the study were Aland, Chittapur, Jewargi and Kalaburagi. A list of villages where redgram is grown as principal crop is prepared in consultation with the officials of Department of Agriculture. Two villages from each talukas were selected based on maximum area under redgram cultivation. The villages selected for the study were Madan Hipperga and Narona from Aland taluka, Kalgi and Dandothi from Chittapur taluka, Yedrami and Nelogi from Jewargi taluka and Kamalapur and Srinivas Saradagi from Kalaburgi taluka. Thus a total of eight villages were selected from four talukas. Considering all farmers in the selected villages, the criteria for selection of farmer as a respondent is that, he should successfully cultivate redgram crop. Along with redgram one or the other intercrops and enterprises like dairy (minimum two milch animals), sheep/goat farming (minimum of four sheep's/goat/unit), poultry rearing *etc*. From the each selected village, a separate list of redgram based farmers was prepared in consultation with officials of Department of Agriculture. From the list prepared, 30 farmers were selected randomly by using simple random sampling technique. Thus, the study sample comprised of 240 respondents. Ex-post-facto research design was employed for conducting study. Data was collected by using a detailed interview schedule employing personal interview method. The responses were scored, quantified, categorized and tabulated using percentage, mean and standard deviation.

III. RESULTS AND DISCUSSION

3.1 Profile characteristics of the farmers about sustainable practices of redgram based farming system

3.1.1 Age

Age is an important factor as it reveals the maturity of an individual to take decisions for achieving his needs. From the Table 1 it could be inferred that, little over half (52.50 %) of the farmers were in middle age group (31-50 years) followed by 29.59 per cent of the farmers were in old age group (above 50 years) and 17.91 per cent of the farmers were in young age group (up to 30 years). The probable reason for this could be that, the middle aged farmers were actively involved in the farm activities, are enthusiastic and had more work efficiency than older ones. Further individuals of middle age group have more physical vigour and share more family responsibility than the younger ones. They also have a strong desire to be an earning member and contribute their share to the income of their family. The findings are in line with the findings of Sunitha (2015).

TABLE 1

DISTRIBUTION OF FARMERS BASED ON THEIR PROFILE CHARACTERISTICS

Sl. No.	Characteristics	Categories	Frequency	Percentage
1.	Age	Young (up to 30 years)	43	17.91
		Middle (31-50 years)	126	52.50
		Old age (>50 years)	71	29.59
2.	Education	Illiterate (Can't read and write)	58	24.17
		Primary school (1 to 4th Std)	27	11.25
		Middle school (5th to 7th Std)	29	12.08
		High school (8th to10th Std)	60	25.00
		Pre-University (11th to12th Std)	30	12.50
		Graduate and above	36	15.00
3.	Type of family	Nuclear (Single couple and unmarried children)	133	55.42
		Joint (More than one couple and married children living together)	107	44.58
4.	Land holding	Marginal farmer (Up to 2.50 acres)	0	0.00
		Small Farmers (2.51 to 5.00 acres)	71	29.59
		Medium Farmers (5.01 to 25.00 acres)	152	63.33
		Big Farmers (Above 25.00 acres)	17	7.08
5.	Farming experience	Less than 10 years	30	12.50
		10 to 20 years	76	31.67
		More than 20 years	134	55.83
6.	Annual income	Low (< 46858.11)	91	37.92
		Medium (46858.11 – 124051.89)	101	42.08
		High (> 124051.89)	48	20.00
		Mean = 85455.00	**SD = 90816.20**	
7.	Cropping intensity	Low (< 6.44)	99	41.25
		Medium (6.44 – 11.92)	73	30.42
		High (> 11.92)	68	28.33
		Mean = 9.18	**SD = 6.11**	
8.	Material possession	Low (< 4.75)	77	32.08
		Medium (4.75 – 6.35)	112	46.67
		High (> 6.35)	51	21.25
		Mean = 5.55	**SD = 1.88**	
9.	Livestock possession	Low (< 3.50)	116	48.33
		Medium (3.50 – 9.03)	80	33.33
		High (> 9.03)	44	18.33
		Mean = 6.27	**SD = 6.51**	
10.	Extension orientation	Low (< 5.72)	74	30.84
		Medium (5.72 – 8.26)	101	42.08
		High (> 8.26)	65	27.08
		Mean = 6.99	**SD = 2.99**	
11.	Mass media utilization	Low (< 7.41)	88	36.67
		Medium (7.41 – 10.08)	101	42.08
		High (> 10.08)	51	21.25
		Mean = 8.75	**SD = 3.15**	
12.	Innovativeness	Low (< 10.29)	62	25.83
		Medium (10.29 – 12.30)	127	52.92
		High (> 12.30)	51	21.25
		Mean = 11.30	**SD = 2.36**	
13.	Achievement motivation	Low (< 9.49)	76	31.67
		Medium (9.49 – 11.07)	103	42.92
		High (> 11.07)	61	25.42
		Mean = 10.28	**SD = 1.85**	
14.	Scientific orientation	Low (< 7.77)	48	20.00
		Medium (7.77 – 9.23)	115	47.92
		High (> 9.23)	77	32.08
		Mean = 8.50	**SD = 1.72**	
15.	Risk orientation	Low (< 2.98)	51	21.25
		Medium (2.98 – 4.01)	133	55.42
		High (> 4.01)	56	23.33
		Mean = 3.50	**SD = 1.21**	
16.	Management orientation	Low (< 11.11)	84	35.00
		Medium (11.11 – 12.96)	100	41.67
		High (> 12.96)	56	23.33
		Mean = 12.04	**SD = 2.17**	

3.1.2 Education

Education is one of the important factors that influence the knowledge of individuals. It is clear from the Table 1 that one fourth (25.00 %) of the farmers were educated up to high school level followed by illiterates (24.17 %), studied degree and above (15.00 %), pre-university (12.50 %), middle school (12.08 %) and primary school education (11.25 %), respectively. The probable reason for this could be attributed to the availability of free basic education and the educational infrastructure in the study area. Few of them opted higher education reflecting on their affordability and interest to learn more and gain good knowledge. Similar findings were reported by Suresh Kumar (2009).

3.1.3 Type of family

From the Table 1 it is observed that over half (55.42 %) of the farmers belonged to nuclear family followed by 44.58 per cent of the farmers belonged to joint family. This might be due to changing values of family system. The results were in consonance with the findings of Sidram (2015) who reported that majority of farmers belonged to nuclear family.

3.1.4 Land holding

It could be noticed from the Table 1 that majority (63.33 %) of the farmers belonged to medium size of land holding followed by 29.59 per cent of the farmers belonged to small size of land holding and least 7.08 per cent of the farmers belonged to big size of land holding. This could be due to the transfer of ancestral land holding from generation to generation, interest of farmers to continue in the farming occupation as the source of income. Similar findings were observed with Sharma e*t al.* (2017) and Vidhi Motiwale (2018).

3.1.5 Farming experience

It is evident from the Table 1 that over half (55.83 %) of the farmers had more than 20 years of farming experience followed by 31.67 per cent of the farmers had 10 to 20 years of farming experience and only 12.50 per cent of the farmers had less than 10 years of farming experience. The probable reason for this could be that, the farmers who had farming experience of more number of years were interested and knowledgeable in sustainable cultivation practices of redgram based farming system. The findings were in accordance to the findings as reported by Biradar (2012).

3.1.6 Annual income

The economic position of the farmers as presented in the Table 1 revealed that one third (42.08 %) of the farmers belonged to medium annual income category followed by low (37.92 %) and high income group (20.00 %) categories. The possible reason might be that majority of farmers 5 to 25 acres of land holding indicating better economic conditions of the redgram based farmers their dependency mainly on agriculture production and adoption of different enterprises. The findings were in accordance to the findings as reported by Sharma *et al.* (2017).

3.1.7 Cropping intensity

It was evident from the Table 1 that one third (41.25 %) of the farmers belonged to low cropping intensity followed by medium (30.42 %) and high (28.33 %) cropping intensity categories. The incidence of low cropping intensity might be due to more dependence on rainfed water by the farmers. Similar results regarding cropping intensity were observed in the findings of Krishnamurthy (2015).

3.1.8 Material possession

The data in the Table 1 revealed that nearly half (46.67 %) of the farmers had medium material possession, followed by low (32.08 %) and high (21.25 %) material possession. Nowadays mobile phones are common medium of mass media owned by the people. Probable reason for above findings is due to the changing needs of the family members and also for the comfort of transportation, they possess two wheelers. Pertaining to farm implements, sprayers and wooden plough are the implements used by the redgram based farmers to carry out different agricultural operations in their fields. Findings are in accordance with findings of Tanweer Ahmed (2015)

3.1.9 Livestock possession

It was observed from the Table 1 that nearly half (48.33 %) of the farmers had low level of livestock possession followed by (33.33 %) medium and high (18.34 %) of livestock possession, respectively. It is due to the fact that cattle waste like cow dung and urine are the main inputs in farm yard manure and vermicompost, which are used in sustainable farming. Further, dairy

being the subsidiary occupation for the redgram based farmers had contributed to above trend of findings. The results are in line with the results of Ningareddy (2005).

3.1.10 Extension orientation

The results showed from the Table 1 that over one third (42.08 %) of the farmers had medium level of extension orientation followed by low 30.84 per cent and high 27.08 per cent of the farmers belonged to extension orientation, respectively. As per the study some of the farmers are opinion leaders and innovators in their respective village which leads them to keeping good extension contact with the experts in regular interval. Since they were opinion farmers they attended different extension programmes and trainings regularly and promoting the sustainable agriculture practices to fellow farmers also. The results are in conformity with findings of Sunilkumar (2004) and Sajeev and Saroj (2014).

3.1.11 Mass media utilization

The finding from the Table 1 showed that, over one third (42.08 %) of the farmers had medium mass media utilization followed by low 36.67 per cent and high 21.25 per cent of the farmers belonged to mass media utilization respectively. Mass media utilization enhances the ability of farmers to get more information about current affairs as well as information on recent agricultural technology or innovation and in turn widens the mental horizon of the farmers to accept and adopt the practices. The results are in conformity with the findings of Nagesh (2006).

3.1.12 Innovativeness

The findings presented in the Table 1 revealed that little over half (52.92 %) of the farmers had medium level of innovativeness followed by 25.83 per cent were low and 21.25 per cent of them had high level of innovativeness. Innovativeness plays a greater role in the individual's personality. The person with higher innovativeness can do things rapidly and more precisely than others. This also may be attributed to the fact that majority of the farmers had education up to high school and pre university/diploma. Generally, higher the formal education level, more the innovations. In such conditions, respondents try to seek more information and try out new ideas and technologies within their budget and limits and also farmers who are prone to innovations will try to gather information regarding the new technology from various aspects, they wanted to learn new ways of farming, improved cultivation practices and adopt those technologies at faster rate with maximum accuracy. Similar findings were reported by Maraddi (2006) and Sidramayya (2013).

3.1.13 Achievement motivation

Data pertaining to achievement motivation in the Table 1 revealed that one third (42.92 %) of the farmers had medium level of achievement motivation followed by 31.67 per cent and 25.42 per cent of the farmers belonged to low and high level of achievement motivation categories, respectively. The probable reason could be that achievement motivation is basic character which motivates and helps an individual to do anything. It is a psychologically internalized condition which drives an individual to aspire for higher level of earning and living. The findings are in line with the findings of Maraddi (2006) and Sidram (2008).

3.1.14 Scientific orientation

The results presented in the Table 1 indicated that nearly half (47.92 %) of the farmers possessed medium level of scientific orientation followed by high 32.08 per cent and low 20.00 per cent scientific orientation category. The probable reason could be that, scientific orientation is the orientation of farmer to adopt new technologies in a scientific way. Redgram being a traditional crop, farmers were found to be equally adopting traditional and conventional methods been observed in major redgram growing areas due to unscientific usage of irrigation. The problem of soil salinity is severe in black soil, which is the major soil profile in the study area. This fact has prompted the farmers to adopt sustainable practices to reduce the problem of soil salinity. Similar observation was made by Sidram (2008).

3.1.15 Risk orientation

Findings of risk orientation depicted in the Table 1 that over half (55.42 %) of the farmers were having medium level of risk orientation followed by 23.33 per cent had high and 21.25 per cent belonged to low level of risk orientation. The probable reason could be that farmers in these categories might have made up their mind to take risk and have put efforts to adopt new agricultural technology for sustainability of their farming systems. It could be due to the fact that risk taking is a must for farmers to earn money to lead a better life. The results were supported by the findings of Sharma *et al.* (2017).

3.1.16 Management orientation

It could be noticed from the Table 1 that one third (41.67 %) of the farmers belonged to medium management orientation followed by 35.00 per cent had low and 23.33 per cent belonged to high level of management orientation respectively. The probable reason could be that, this might be due to the fact that the NGO's and field extension personnel of private companies were working with many prospective farmers in different areas and those interactions might have helped the farmers to reorient their management orientation. Then personal explosive of the farmers to various professional situations like group discussion meeting, exhibitions, field days, krishimela *etc.*, might have also contributed to development of medium level of management orientation. The findings are in accordance with the studies conducted by Maraddi (2006) and Sidramayya (2013).

3.2 Individual component wise material possession

The data in the Table 2 revealed that with regard to household material large majority (97.91 %) of the farmers possessed mobile phone. The probable reason could be that, majority of the farmers possessed mobile phones, scooter, ceiling fan, mixer/grinder, refrigerator and bicycle. The least number of farmers had possessed was four wheeler. The reason for low possession of four wheeler was most of the farmers belonged to medium land holding and medium annual income category and the four wheeler cost of material is high (> 4 lakh). So there is a low possession regarding four wheelers. These results are in line with the results of Krishnamurthy (2015). With regard to farm implements large majority (90.00 %) of the farmers possessed sprayer. The probable reason could be that, majority of the farmers possessed sprayer, wooden plough, MB plough, harrow, tractor, seed cum fertilizer drill and thresher. The reason for none or low possession of seed cum fertilizer drill and thresher may be attributed to the fact that special skill is required for operation and cost of equipment is high (> 5 lakh) and non availability of equipment in local area. These results are in line with the results of Nagaraj (2012).

TABLE 2
DISTRIBUTION OF FARMERS ACCORDING TO THEIR INDIVIDUAL COMPONENT WISE MATERIAL POSSESSION

Sl. No.	Household materials	F*	%	Farm implements	F*	%
1.	Bicycle	48	20.00	Wooden plough	182	75.83
2.	Scooter	188	78.33	MB plough	41	17.08
3.	Four wheeler	4	1.67	Harrow	34	14.17
4.	Refrigerator	48	20.00	Seed cum fertilizer drill	25	10.41
5.	Mixer/Grinder	97	40.41	Sprayer/Duster	216	90.00
6.	Ceiling fan	174	72.50	Tractor	29	12.08
7.	Mobile	235	97.91	Thresher	10	4.17

F= Frequency, %= Per cent *= Multiple responses

3.3 Individual component wise livestock possession

The data presented in the Table 3 revealed that the possession of the livestock by the farmers. Majority (78.75 %) of farmers were having two to three bullocks, while 6.67 per cent were having more than three and only 2.08 per cent of farmers had less than two bullocks. While 10.41 per cent of the farmers were having two to three buffaloes, while 7.08 per cent and 1.25 per cent of farmers were having more than three and less than two buffaloes respectively. About (16.67 %) of farmers possessed two to three cows, whereas only 10.83 per cent and 8.33 per cent of farmers were having more than three and less than two cows, respectively. While 17.91 per cent of the farmers were having more than three sheep/goats, while, only 1.25 per cent of farmers were having two to three sheep/goat respectively. Whereas, only 8.75 per cent of the farmers were having more than three poultry birds, while 2.08 per cent of the farmers were having two to three poultry birds, respectively. This might be due to the fact that, bullocks are utilized to carry out farm operations like ploughing, harrowing, intercultivation operations, carrying cart *etc*. Cows and buffaloes like income generation by selling milk, selling of sheep and poultry birds in slaughter market, and the wastage of these animals utilized in FYM or vermicompost pit increase the farm income. The reason for non or low possession of sheep and poultry birds might be that farmers expressed they have problems in maintenance of sheep and poultry birds and they have only back yard poultry that too with local poultry breed. These results were in line with the results of Nagaraj (2012).

TABLE 3

DISTRIBUTION OF FARMERS ACCORDING TO THEIR INDIVIDUAL COMPONENT WISE LIVESTOCK POSSESSION

Sl. No.	Livestock possession	Less than two		Two to three		More than three	
		F	%	F	%	F	%
1.	Bullock	5	2.08	189	78.75	16	6.67
2.	Buffaloes	3	1.25	25	10.41	17	7.08
3.	Cow	20	8.33	40	16.67	26	10.83
4.	Sheep/goat	0	0.00	3	1.25	43	17.91
5.	Poultry birds	0	0.00	5	2.08	21	8.75

F= Frequency, %= Percent

3.4 Individual component wise extension orientation

It is noticed from the Table 4 that with respect to extension contact over half (56.25 %) of the farmers contacted Assistant Agricultural Officer whenever problem arise followed by 24.58 per cent of them never contacted, 15.00 per cent of them contacted once in 15 days and 4.17 per cent of them contacted once in a week to Assistant Agricultural Officer. About majority (62.08 %) of the farmers never contacted Agricultural Officer followed by 32.50 per cent of them contacted whenever problem arises. While (88.75 %) of the farmers never contacted Assistant Director of Agriculture followed by 11.25 per cent of them contacted Assistant Director of Agriculture whenever problem arise. The percentage of the farmers who never contacted KVK SMS Scientist was (64.58 %) followed by 27.92 per cent of them contacted whenever problem arise. It is found that (73.75 %) of them never contacted NGO's followed by 24.17 per cent of them contacted whenever problem arise. It is noticed that (72.92 %) of the farmers contacted private input agencies whenever problem arise, followed by 17.50 per cent of them contacted once in 15 days. The possible reasons for whenever problem arise contact with farm facilitators, Assistant Agriculture Officers and Agriculture Office could be their availability at village and hobli level, respectively. When problem arises contact was observed with Scientists of KVKs and University as they are providing technical know-how of management practices of redgram crop. Whereas, Private agency field staff were consulted as farmer required continuous supervision regarding maintenance. The results are in conformity with findings of Sunilkumar (2004).

TABLE 4

DISTRIBUTION OF FARMERS ACCORDING TO THEIR INDIVIDUAL COMPONENT WISE EXTENSION ORIENTATION

A. Extension contact:

(n=240)

Sl. No.	Extension personnel	Frequency of contact							
		Once in a week		Once in 15 days		Whenever problem arise		Never	
		F	%	F	%	F	%	F	%
1.	Assistant Agriculture Officer (AAO)	10	4.17	36	15.00	135	56.25	59	24.58
2.	Agriculture Officer (AO)	0	0.00	13	5.42	78	32.50	149	62.08
3.	Assistant Director of Agriculture (ADA)	0	0.00	0	0.00	27	11.25	213	88.75
4.	KVK SMS Scientist	0	0.00	18	7.50	67	27.92	155	64.58
5.	Representatives of NGO's	0	0.00	5	2.08	58	24.17	177	73.75
6.	Representatives of private input agencies	23	9.58	42	17.50	175	72.92	0	0.00

F= Frequency, %= Per cent

B. Extension participation

(n=240)

Sl. No.	Extension activities	Participated		Extent of participation					
				Regular		Occasional		Never	
		F	%	F	%	F	%	F	%
1.	Demonstrations	64	26.67	8	3.33	56	23.33	176	73.33
2.	Group meetings	139	57.92	13	5.42	126	52.50	101	42.08
3.	Field days	43	17.92	8	3.33	35	14.58	197	82.08
4.	Educational tours	18	7.50	5	2.08	13	5.42	222	92.50
5.	Field visits	40	16.67	7	2.92	33	13.75	200	83.33
6.	Training programmes	112	46.67	26	10.83	86	35.83	128	53.33
7.	Agriculture exhibitions	87	36.25	9	3.75	78	32.50	153	63.75
8.	Krishi mela	203	84.58	29	12.08	174	72.50	37	15.42

F= Frequency, %= Percent

With respect to extension participation majority (84.58 %) of the farmers participated in krishimela followed by group meetings (57.92 %), training programmes (46.67 %), agriculture exhibitions (36.25 %), demonstrations (26.67 %), field days (17.92 %) and field visits (16.67 %). Only 7.50 per cent of them participated in educational tours. Krishimela, demonstrations, field visits and field days help in developing confidence among the sustainable redgram based farmers. Krishimela organized by state agricultural university or agriculture department, is important extension activity to exchange ideas, problems and solutions related to sustainable farming. Krishimela is conducted every year at fixed month that enables the farmer's field and many of them might have participated in it. Similar could be reason for field visits. Also the eagerness of farmers in solving their problems and better exposure with officials working in extension organization and also their interest, faith and belief in the extension services provided by the Karnataka State Department of Agriculture and State Agriculture Universities. The results also implied that the regular participation in various extension activities was low, the reason might be the inconvenient timings of extension activities to farmers, they might have been busy in agricultural operations and allied activities, and might not known about the programme due to improper communication. The above findings were in accordance with the findings of study conducted by Sajeev and Saroj (2014).

3.5 Individual component wise mass media utilization

The results pertaining to mass media utilization presented in the Table 5 revealed that, only 11.67 per cent of farmers possessed radio, where in 3.33 per cent of them regularly listened agriculture programmes followed by 8.75 per cent of them who listened occasionally the agriculture programmes through radio and 7.92 per cent of the farmers listened general programmes regularly followed by 12.08 per cent listened occasionally general programmes through radio. This showed that less per cent of them listened to radio occasionally. Radios have become less popular obviously for the reasons that it has only the audio effect and the televisions with audio and visual effects have become affordable to all. The other reason may be that the listening behaviour of radio depends on individuals interests.

Large majority (96.67 %) of the farmers owned television as a most important form of media. When viewing behaviour analyzed it was noted that 14.17 per cent of them regularly viewed agricultural programmes followed by 32.50 per cent who viewed occasionally and 75.83 per cent of the farmers viewed general programmes regularly followed by 24.17 per cent viewed occasionally. So majority of the farmers used it for watching the general programme rather than the agricultural programmes. The reason could be that most of the agricultural programmes are being telecasted in the morning hours and the farmers could not spend time to watch television in the morning hours because usually the farmers go to their fields early in the morning and

after completing all the field works in the evening hours. Also the people could prefer to watch general programme that are more entertaining than the agriculture programmes.

TABLE 5
DISTRIBUTION OF FARMERS ACCORDING TO THEIR INDIVIDUAL COMPONENT WISE MASS MEDIA UTILIZATION

(n=240)

Sl. No.	Mass Media	Subscriber/ Possessed		Programmes	Frequency of use					
					Regular		Occasional		Never	
		F	%		F	%	F	%	F	%
1.	Radio	28	11.67	Agriculture information	8	3.33	21	8.75	211	87.92
				General information	19	7.92	29	12.08	192	80.00
2.	Television	232	96.67	Agriculture information	34	14.17	78	32.50	128	53.33
				General information	182	75.83	58	24.17	0	0.00
3.	Newspaper	39	16.25	Agriculture information	11	4.58	33	13.75	196	81.67
				General information	66	27.50	48	20.00	126	52.50
4.	Farm Magazines	21	8.75	Agriculture information	2	0.83	22	9.17	216	90.00
				General information	0	0.00	0	0.00	0	0.00
5.	Mobile SMS	209	87.08	Agriculture information	28	11.67	95	39.58	117	48.75
				General information	183	76.25	57	23.75	0	0.00
6.	Kissan Call Centre	27	11.25	Agriculture information	0	0.00	37	15.42	203	84.58
				General information	0	0.00	0	0.00	0	0.00

Further the result also revealed that, only 16.25 per cent of the farmers subscribed for newspaper, while 4.58 and 27.50 per cent of the farmers were regular reader of agriculture and general programmes. About 13.75 and 20.00 per cent of the farmers were occasional reader of agriculture and general programmes respectively. Majority of them are not subscribed newspaper, as majority could get all the news from the television sets they possess.

In case of farm magazine, 8.75 per cent of the farmers subscribed of whom 0.83 per cent of farmers were regular readers; while 9.17 per cent of them were occasional readers of agriculture programmes. The possible reason for this might be lack of time and interest. Whenever they are in need of it they would barrow it from the other subscriber farmers.

Majority (87.08 %) of farmers possessed mobile SMS. In which 11.67 and 76.25 per cent of them regularly viewed; and 39.58 and 23.75 per cent of farmers occasionally viewed agricultural and general programmes, respectively. Most of the farmers are registered farmers to APMC, KVK and NGOs, they will be receiving the messages based on the seasons of the crop or market rate of the crop.

In case of kissan call center only 11.25 per cent of farmers were subscribed of whom 15.42 per cent of the farmers were occasional callers to the kissan call center. The farmers were asking the information about soil health card scheme, different varieties of crops to be grown in that area, spraying of insecticides to the crop and disease affected crops spraying the solutions would be asked in kissan call center.

The findings of the result are similar to the findings of Sharma *et al.* (2017).

IV. CONCLUSION

From the above discussion it could be concluded that majority of the farmers were in middle age group, had high school education, belonged to nuclear family, medium size of land holding, had more than 20 years of farming experience, medium annual income, low cropping intensity, medium material possession, low livestock possession, medium extension orientation, medium mass media utilization, medium level of innovativeness, medium level of achievement motivation, medium scientific orientation, medium risk orientation, and medium management orientation. Hence, the government and private organization should emphasis for up scaling these variables for their advantage in order to improve knowledge level of sustainable practices in redgram based farming system and also intensive training programs needs to be conducted by government and non-government agencies to improve the profile characteristics of redgram based farmers.

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