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A study on relationship between profile characteristics and sustainability of onion cultivation

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Abstract

The present study was conducted in Vijayapura, Bagalkote and Gadag districts of northern dry zone of Karnataka during 2022-23 with *ex-post facto* research design. The sample size was 270 for the study comprising of 90 onion growers from each district. Sustainability considers how we might coexist peacefully with nature while preventing its deterioration and destruction. Sustainability is also affected by profile characteristics of onion growers. Hence, the present study was carried out to know the relationship between profile characteristics and sustainability of onion cultivation. Innovative proneness and extension participation had shown positive and significant relationship with the sustainability index of onion cultivation for Vijayapura district. In case of overall relationship, it was observed that annual income and extension participation had exhibited positive and significant relationship at one per cent level. The coefficient of determination revealed that nearly one third of the variation in the sustainability of onion cultivation had influenced the dependent variable with respect to Vijayapura district. Overall multiple regression analysis revealed that only 10.50 per cent had influenced the dependent variable.

Keywords: Profile characteristics, sustainability, innovative proneness, extension participation

Introduction

Onion is one of the important cash crops irrespective of state, region in India. Similarly, it is considered as an important commercial crop in northern dry zone of Karnataka also, which is mainly under rain fed condition. Sustainability of onion cultivation is the idea of creating the most positive results, while reducing negative impacts. Proper and timely care is crucial for onion cultivation with tillage practices, nutrient management, fertilization, water management, plant protection measures, harvesting and post harvest management today. Sustainability of onion cultivation is also influenced by farmers' profile characteristics. These qualities are part of one's personality, behaviour, socio-economic conditions that help others to understand who you are professionally, socially and economically. These influence all the activities including agriculture in general, particularly onion cultivation here. The understanding of these profile characteristics helps extension workers to make use of such onion growers in extension activities, programmes, to influence them to adopt economically viable, environmentally friendly, socially accepted, suitable, improved practices, technologies *etc.* in sustainable onion cultivation.

Hence, the present study was taken up to know the relationship between profile characteristics and sustainability of onion cultivation

Material and methods

The present study was conducted during the year 2022-23. *Ex-post facto* research design was used for the study purpose. Vijayapura, Bagalkote and Gadag districts of northern dry zone of Karnataka were selected based on the highest area under onion cultivation. Two taluks from each district were selected based on the same criteria. Three villages from each taluk and 15 farmers from each village were selected randomly. So, the sample size was 270 onion growers. Sustainable index (SI) for onion cultivation was developed for the study purpose. Sustainable index included thirteen sustainable indicators under production, economic and social dimensions. Sustainability of onion cultivation was the independent variable. Sixteen independent variables were selected for the study purpose. Structured, pre tested interview schedule was used to collect the data.

Results and discussion

The results presented in Table 1 revealed that out of 16 independent variables studied only innovative proneness was found to be positive and highly significant at one per cent level with the sustainability index of onion cultivation. While, extension participation had shown positive and significant relationship at five per cent level with the sustainability index of onion cultivation for Vijayapura

district.

These results might be due to the reason that majority of the farmers were between middle to old age. Because of their more experience in farming, they might have developed innovative character to sustain and continue in the

agriculture especially in onion cultivation. Further, the participation in extension activities provide firsthand information, hands on experience, direct contact with various stake holders including scientists, progressive and fellow farmers and also the

Table 1: Relationship between profile characteristics of onion growers with sustainability index of onion cultivation

Sl. No.	Variables	Correlation co-efficient (r)			
		Vijayapura n ₁ = 90	Bagalkote n ₂ = 90	Gadag n ₃ = 90	Overall N = 270
1.	Age	0.030	- 0.029	- 0.061	- 0.011
2.	Education	0.096	- 0.014	- 0.078	- 0.091
3.	Family size	0.037	0.118	0.039	0.105
4.	Land holding	- 0.131	0.000	- 0.031	- 0.044
5.	Occupation	- 0.198	0.201	- 0.164	- 0.032
6.	Experience in farming	- 0.045	0.047	- 0.092	- 0.006
7.	Experience in onion cultivation	0.038	- 0.066	- 0.067	- 0.028
8.	Annual income	0.030	0.191	0.100	0.170**
9.	Extension contact	0.181	0.110	-0.167	0.108
10.	Extension participation	0.234*	0.181	-0.070	0.164**
11.	Mass media participation	0.060	0.019	0.120	0.083
12.	Access to e-tools	- 0.013	- 0.020	0.160	0.008
13.	Innovative proneness	0.320**	0.089	0.027	0.084
14.	Scientific orientation	- 0.142	0.193	- 0.029	0.011
15.	Risk orientation	- 0.047	0.179	0.109	0.039
16.	Achievement motivation	0.206	0.174	0.011	0.041

** Significant at 1 per cent level * Significant at 5 per cent level NS non-significant

Table 2: Multiple linear regression analysis of profile characteristics of Vijayapura district onion growers with sustainability index of onion cultivation n = 90

Sl. No.	Variables	Regression coefficient (b)	Standard Error	t
1.	Age	0.140	0.161	0.869
2.	Education	0.451	0.631	0.714
3.	Family size	0.239	0.263	0.908
4.	Land holding	- 0.191	0.180	- 1.058
5.	Occupation	- 0.460	0.467	- 0.984
6.	Experience in farming	- 0.161	0.172	- 0.937
7.	Experience in onion cultivation	0.068	0.181	0.374
8.	Annual income	0.000	0.000	0.374
9.	Extension contact	0.298	0.371	0.803
10.	Extension participation	1.156	0.666	1.736
11.	Mass media participation	0.693	0.572	1.212
12.	Access to e-tools	- 0.196	0.173	- 1.129
13.	Innovative proneness	1.336	0.475	2.813**
14.	Scientific orientation	- 4.881	2.594	- 1.882
15.	Risk orientation	- 1.264	1.875	- 0.674
16.	Achievement motivation	0.834	0.775	1.076

$R^2 = 0.329$ $F = 2.240$ ** Significant at 1 per cent level of probability * Significant at 5 per cent level of probability

availability of many sources of inputs, sources of advanced and improved agricultural practices prevailing in their region or locality. The result was similar with the result of the study conducted by Shwetha (2016) [6].

In case of overall relationship, only annual income and extension participation had exhibited positive and significant relationship at one per cent level with the sustainability index of onion cultivation. As the annual income increases, farmers naturally tend to purchase quality inputs to get quality produce and better price for their produce.

The possible reasons for their extension participation could be that they might have eagerly participated to gain knowledge and to have firsthand information about sustainable onion cultivation. Their participation in extension activities like Krishi / Totagarika mela,

exhibitions and training programmes provide the onion growers direct information and contrived experience based on the extension principles namely “seeing is believing and learning by doing”, direct contact with extension personnel, other onion growers, different stake holders of onion farming and also their exposure to different input agencies. The results are in line with the findings of Venkataramulu (2003) [7].

Multiple linear regression analysis was carried out to determine the extent of contribution made by the independent variables towards the variation in sustainable onion cultivation. It could be clear from the results (Table 2) that F value (2.240), obtained from the multiple regression analysis was found to be statistically significant at one per cent level with respect to innovative proneness only. The coefficient of determination (R^2) was 0.329 revealed that

32.90 per cent of the variation in the sustainability of onion cultivation had influenced the dependent variable with respect to Vijayapura district.

The possible reasons could be sustainable onion cultivation is very important as onion is the major and very important cash crop particularly in northern dry zone area of

Karnataka. As majority of onion growers belonged to marginal to medium category of landholdings, who depend exclusively on agriculture, high per cent found in low income group might have compelled them to continue onion as major crop of cultivation and its sustainability is very vital to survive which

Table 3: Multiple linear regression analysis of profile characteristics of Bagalkote district onion growers with sustainability index of onion cultivation n = 90

Sl. No.	Variables	Regression coefficient (b)	Standard Error	t
1.	Age	0.004	0.165	0.024
2.	Education	- 0.476	0.853	- 0.558
3.	Family size	0.299	0.559	0.535
4.	Land holding	- 0.045	0.150	- 0.299
5.	Occupation	1.113	0.645	1.726
6.	Experience in farming	0.249	0.173	1.434
7.	Experience in onion cultivation	- 0.296	0.202	-1.465
8.	Annual income	0.000	0.000	1.387
9.	Extension contact	0.121	0.361	0.336
10.	Extension participation	0.662	0.759	0.872
11.	Mass media participation	- 0.106	0.373	- 0.285
12.	Access to e-tools	0.002	0.117	0.017
13.	Innovative proneness	- 0.266	0.576	- 0.461
14.	Scientific orientation	0.665	1.045	0.636
15.	Risk orientation	1.246	1.147	1.086
16.	Achievement motivation	- 0.044	0.520	- 0.084

$R^2 = 0.170$ $F = 0.931$ ** Significant at 1 per cent level * Significant at 5 per cent level

Table 4: Multiple linear regression analysis of profile characteristics of Gadag district onion growers with sustainability index of onion cultivation n = 90

Sl. No.	Variables	Regression coefficient (b)	Standard Error	t
1.	Age	0.036	0.104	0.350
2.	Education	- 0.462	0.482	- 0.958
3.	Family size	- 0.002	0.261	- 0.008
4.	Land holding	- 0.148	0.137	-1.082
5.	Occupation	- 0.589	0.346	-1.704
6.	Experience in farming	- 0.079	0.131	- 0.602
7.	Experience in onion cultivation	- 0.017	0.128	- 0.136
8.	Annual income	0.000	0.000	1.101
9.	Extension contact	- 0.294	0.213	- .382
10.	Extension participation	- 0.095	0.345	- 0.275
11.	Mass media participation	0.000	0.141	- 0.003
12.	Access to e-tools	0.049	0.042	1.165
13.	Innovative proneness	0.045	0.742	0.061
14.	Scientific orientation	- 1.242	1.246	- 0.997
15.	Risk orientation	1.569	0.853	1.839
16.	Achievement motivation	0.434	0.907	0.479

$R^2 = 0.158$ $F = 0.856$ ** Significant at 1 per cent level * Significant at 5 per cent level

Table 5: Overall multiple linear regression analysis of profile characteristics onion growers with sustainability index of onion cultivation n = 270

Sl. No.	Variables	Regression coefficient (b)	Standard Error	t
1.	Age	0.032	0.093	0.342
2.	Education	- 0.586	0.406	- 1.442
3.	Family size	0.237	0.220	1.076
4.	Land holding	- 0.143	0.096	- 1.491
5.	Occupation	- 0.170	0.306	- 0.555
6.	Experience in farming	0.003	0.103	0.030
7.	Experience in onion cultivation	- 0.109	0.110	- 0.985
8.	Annual income	1.806	0.000	3.081**
9.	Extension contact	0.254	0.193	1.319
10.	Extension participation	0.665	0.374	1.776
11.	Mass media	0.286	0.177	1.621
12.	Access to e-tools	- 0.058	0.054	- 1.068
13.	Innovativeness	0.352	0.347	1.015
14.	Scientific orientation	- 0.868	0.742	- 1.170
15.	Risk orientation	0.075	0.736	0.102
16.	Achievement motivation	- 0.055	0.353	- 0.156

$R^2 = 0.105$ $F = 1.855$ ** Significant at 1 per cent level * Significant at 5 per cent level

is the main source of their livelihood? Other attributes like exposure to mass media, extension contact and participation might have also contributed to their innovative proneness.

Results had shown non-significant relationship between profile characteristics of Bagalkote as well as Gadag (Table 3 and 4) district onion growers with sustainability index of onion cultivation. Age, education, risk orientation had shown non-significant relationship in the study conducted by Namitha and Seema (2017) ^[5].

Overall multiple regression analysis was carried out to determine the extent of contribution made by the independent variables towards the variation in sustainable onion cultivation. The results of Table 5 revealed that 'F' value (1.855), obtained from the multiple regression analysis was found to be statistically significant at one per cent level with respect to annual income only. The coefficient of determinative (R^2) was 0.105 revealed that only 10.50 per cent of the variation in the sustainability of onion cultivation had influenced the dependent variable. This might be due to factors that more the income more use of improved and advanced technology which might had contributed towards sustainability of onion cultivation. As the increase in the income, their extension contact and participation might have also increased to update the improved technology of onion cultivation. The results of study conducted by Gelaneh and Assefa (2014) ^[4] had shown similar results.

Conclusion

Innovative proneness was found to be positive and highly significant at one per cent level, while extension participation had shown positive and significant relationship at five per cent level with the sustainability index of onion cultivation for Vijayapura district. In case of overall relationship of all the three districts with the sustainability index of onion cultivation had revealed only annual income and extension participation exhibited positive and significant relationship at one per cent level. The coefficient of determination revealed that 32.90 per cent of the variation in the sustainability of onion cultivation had influenced the dependent variable with respect to Vijayapura district. Overall multiple regression analysis revealed that only 10.50 per cent of the variation in the sustainability of onion cultivation had influenced the dependent variable. Extension workers can make use of these characters of onion growers in any extension programmes/ activities related to sustainable onion cultivation to bring about desirable changes in them.

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