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Information sources utilization for sustainable king Chilli production - An analysis

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Abstract

Sustainable king chilli production demands keeping soil alive with natural organic matter, adoption of integrated insect pest management, reduced or no use of insecticides or pesticides along with maintaining biodiversity, ensuring the quality and adequate production so that it does not harm the environment and ecology and meet the demands of coming generation also. King chilli is one of the most successfully grown spice crops in Peren district of Nagaland. Therefore, Peren district was purposively selected for the present study. The basic objective of undertaking research was to analyze the information sources utilization pattern for sustainable king chilli production among the farmers and examine how the socio-economic variable influences the information retrieval and utilization for sustainable production of king chilli production. Sample included a total number of 120 king chilli farmers selected based on proportionate random sampling. The major findings of the study revealed that majority (79.17 %) of the respondents had medium level of overall utilization of information sources for sustainable king chilli production with utilization of informal information sources identified as the most preferred source for utilization of agriculture related information by the king chilli farmers. It was also found that variables viz; education, training exposure, social participation, attitude and knowledge had positive and significant association with the information sources utilization by the respondents.

Keywords: King chilli production, information sources, sustainability, Nagaland

Introduction

Sustainable crop production refers to agricultural production in such a way that doesn't impose any harm to environment, biodiversity and quality of agricultural crops. Producing crops sustainably increases the ability of the system to maintain stable levels of food production and quality for long term without increasing the demand and requirements of agricultural chemical inputs to control the system (Imadi *et al.* 2016) [8]. Information is a key factor and vital resource for any development. It is regarded as a basic necessity in daily life, including farming activities (Badiru *et al.* 2016; Hassen *et al.* 2012) [2, 7]. The proper identification and use of information sources are prerequisites for objective decision making (Adio *et al.* 2016) [1]. Information sources play an important role in communicating innovative technologies to the ultimate users making them not only aware of the useful information but also create interest, promote understanding, assist in mental evaluation and ultimately motivate them for adoption (Gupta and De, 2011) [6]. Effective communication from different sources and channels are the essence of extension, which provides knowledge and information for rural people to modify their behaviour in the ways that provide sustainable benefits to them and to the society (Gunawardana *et al.* 2005) [5]. Agricultural information is not only essential for agricultural development but also to enhance the living standard of rural farmers (Uwandu *et al.* 2018) [22]. So it is evident that for sustainable agricultural development proper dissemination of information is highly necessary. World leaders have realized the importance of sustainable agricultural development that various official discussion forums have been held. Concrete programs to introduce this matter by international agencies in various countries indicate the importance of sustainable agricultural development (Ustriyana and Dewi, 2017) [21]. King chilli is one of the most cultivated spice crops in the state of Nagaland. It is usually grown in the hilly terrain of *jhum* fields with multiple crops like paddy, maize, beans,

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cucumber, local garlic, summer squash, ginger, etc. King chilli production starts with sowing in the early spring of March and harvested with the arrival of autumn till the month of November. King chilli is a traditional food item of Nagaland and believed to be the original home. The State Government of Nagaland has also obtained the patent rights of Naga king chilli and got Geographical Indication (GI) tag in 2008. Sustainable king chilli cultivation in Nagaland had a steady progress from 600 ha in 2012-2013 to 1385 ha in 2015-2016 with a total production of 2500 MT and 7739 MT respectively (Statistical Handbook of Nagaland, 2015) [18]. King chilli is a crop of economic importance in Peren district of Nagaland with a total area of 230 ha and production of 1564 MT (Statistical Handbook of Nagaland, 2017) [19] making it the highest in king chilli production in the region.

Majority of the king chilli farmers of the region depend on indigenous or local knowledge for sustainable farming systems. Such knowledge (indigenous or local knowledge) refers to skills and experiences gained through oral tradition and practice over many generations but the use of such primitive skills by the farmers, has not substantially helped to improve yield. There is a wide gap between available knowledge of sustainable improved technology and actual practice and this has had a considerable effect on the attempt at increasing sustainable king chilli production (Adio *et al.* 2016) [1]. Thus, the present research was planned with an objective to identify the information sources utilization pattern by king chilli farmers for sustainable king chilli production in the region.

Methodology

The study was conducted in Peren district of Nagaland. Further, two Rural Development (RD) blocks *viz.*, Peren and Tening were randomly selected and three villages from each of these selected RD blocks were included for study based on random sampling. A total of 120 king chilli farmers were selected based on proportionate random sampling. Primary data were collected based on personal interview with the help of a pre-tested structured schedule. The information source utilization pattern of sustainable king chilli production was studied under the dimensions of mass media sources information, formal information sources and informal information sources.

Result and Discussion

Socio economic attributes of the respondents

Table 1 revealed that majority (71.67 %) of the respondents were found between the age group of 30 to 56 years while, 79.17 per cent of them had medium family size with 4 to 9 members. Half (50.83%) of the respondents had education from primary till graduate level. Majority (61.67%) of the king chilli growers had 2.47 acre to 4.94 acre of land under sustainable farming practices while all (36.67 %) of the growers (marginal farmers) had less than 2.47 acre of land under sustainable king chilli production. Majority (91.67%) of the respondents had an annual income ranging ₹.11901 to ₹.245158 while, 82.50 per cent of them had income range of ₹.23844 to ₹.169230 from sustainable king chilli production. The result showed that 30.00 per cent of the respondents had attended training on sustainable king chilli production during the last five years and 70.00 per cent of them had medium level of experience in traditional method of king chilli cultivation. Majority (99.17 %) of the respondents had medium level of market orientation with medium level (90.83 %) of economic motivation. Most (98.00%) of the

respondents had medium level of social participation with favourable level of attitude towards sustainable king chilli production as evidenced by 61.67 per cent of the farmers, while, 84.16 per cent and 92.50 per cent of them had medium level of overall knowledge and adoption of sustainable king chilli cultivation practices. These findings are in line with the findings of Jha (2012) [11] and Singhal and Vatta (2017) [15].

Information source utilization pattern of the respondents and factors affecting it

Table 2 revealed that 26.66 per cent of the respondents received information from extension publications followed by 18.33 per cent who received information from newspaper while five per cent and two per cent of the respondent received information from radio and exhibitions respectively. None of the respondents received information from television. This might be because of the fact that farm families didn't have proper access of television programmes. It was also observed that mass-media source of information was the least preferred means of utilization of agricultural information by the sustainable king chilli growers with a mean information utilization score of 0.52.

Formal information sources

It was evident from Table 2 that 62.50 per cent and 60.83 per cent of the respondents had received information from agri/horti department staff like AFA and AO/SDAO/HO respectively. Further 36.66 per cent, 18.33 per cent and 1.66 per cent of the respondents received information from ATMA, NGOs and KVK respectively. This might be due to the fact that these personnel are appointed by government to assist farmers who also provide agricultural inputs to the farmers (Yadav and Khan, 2005) [23]. So king chilli farmers resorted to them mostly as a preferred source of agriculture information. These findings are in line with the findings of Singh and Pandey (2016) [16] and Reddy *et al.* (2018) [14]. It was also observed that formal source of information was the second most preferred source of agricultural information by the sustainable king chilli growers with mean information utilization score of 2.32.

Informal information sources

It was revealed from table 2 that all (100.00 %) of the respondents received information from progressive farmers. Further 95 per cent, 94.16 per cent and 92.50 per cent of them received information from friends, neighbours and relatives respectively. The findings revealed that the 'progressive farmers' were most contacted and utilized source of agriculture information and ranked at first place in order of preference by the king chilli growers. This might be due to the reason that progressive farmers used and adopted sustainable farming methods and technologies in their field, and the positive impact of the inputs and methods were observed by the king chilli growers with their own eyes with full belief which could be easily implemented in the same situation in their field. Similar findings have been observed by Yadav *et al.* (2011) [24] and Obeng-Koranteng *et al.* (2017) [12]. According to ranking order, informal sources of information were the most preferred means of utilization of agricultural information by the farmers growing king chilli sustainably with mean information utilization score of 6.80.

Overall utilization of information sources

Table 3 revealed that majority (79.17 %) of the respondents had medium level of overall utilization of information sources

for sustainable king chilli production, while 17.50 per cent had high level and only 3.33 per cent had low level of overall utilization of information sources. These findings are in accordance with the findings of Rahman *et al.* (2016)^[13] and Reddy *et al.* (2018)^[14].

Association of independent variables with information source utilization pattern of the respondents

It was evident from Table 4 that independent variables 'education', 'training exposure', 'attitude' and 'knowledge level' had positive and significant association with the information source utilization pattern of the respondents at 1% level of probability. This reveals that the respondents having high education, training exposure, attitude and knowledge level will exhibit higher level of utilization of information sources. It was also observed that independent variables 'social participation' had positive and significant association with of the information source utilization pattern of the respondents at 5% level of probability. This signifies that respondents with active social participation exhibit higher level of utilization of information sources.

It was also observed that independent variables *viz.*, age, family size, total area under agriculture, area under king chilli production, total annual income, annual income from king chilli, experience in sustainable king chilli production, marketing orientation, economic motivation, and adoption

level had non- significant association with the utilization of information sources. These findings are in accordance with the findings of Somvanshi *et al.*, (2016)^[17].

Multiple regression analysis of the predictor variables with information source utilization pattern of the respondents

Regression analysis was employed to determine the combined effect of independent variables on the dependent variable. Further analysis of 't' value (Table 5) of regression coefficients (b) indicated that independent variables age, education and social participation had significant contribution in information source utilization pattern of the respondents for sustainable king chilli production. It was revealed for table 4 that only one variable 'education' showed positive and highly significant association with the information source utilization pattern of the respondents at 1% level of probability and variable 'age' and 'social participation' had positive and significant association with the information source utilization pattern of the respondents at 5% level of probability. The variable 'annual income' had non significant association with the information source utilization pattern of the respondents. The R² value (0.129) signifies that four independent variables taken together could explain 12.9 per cent of the total variations in utilization of information source by the respondents for sustainable king chilli production.

Table 1: Socio-economic profile and selected characteristics of respondents

Sl. No.	Characteristics	Categories	Frequency (%)
1.	Age (Years) Mean = 43.08; SD = 12.88	Young age (<30) Middle age (30-56) Old age (>56)	15 (12.50) 86 (71.67) 19 (15.83)
2.	Family size Mean = 6.67; SD = 2.33	Small (<4 members) Medium (4 - 9 members) Large (>9 members)	08 (6.67) 95 (79.17) 17 (14.16)
3.	Education level Mean = 1.05; SD = 1.29	Illiterate Primary Middle school High school PU Graduate	59 (49.17) 23 (19.17) 20 (16.67) 10 (8.33) 07 (5.83) 01 (0.83)
4.	Total land holding size Mean = 2.82; SD = 0.77	Marginal (<2.47 acre) Small (2.47 - 4.94 acre) Medium (4.95 - 9.88 acre) Large (>9.88 acre)	44 (36.67) 74 (61.67) 02 (1.66) 0 (0.00)
5.	Area under king chilli Mean = 0.81; SD = 0.42	Marginal (<2.47 acre) Small (2.47 - 4.94 acre) Medium (4.95 - 9.88 acre) Large (>9.88 acre)	120 (100.00) 0 (0.00) 0 (0.00) 0 (0.00)
6.	Annual income Mean = 128530.00; SD = 116628.42	Less than ₹. 11901 ₹. 11901 - ₹. 245158 More than ₹. 245158	0 (0.00) 110 (91.67) 10 (8.33)
7.	Net Income from king chilli Mean = 96537.50; SD = 72693.30	Less than ₹. 23844 ₹. 23844 - ₹. 169230 More than ₹. 169230	05 (4.17) 99 (82.50) 16 (13.33)
8.	Training exposure Mean = 0.30; SD = 0.46	Respondents who attended training Respondents who did not attend training	36 (30.00) 84 (70.00)
9.	Experience in king chilli cultivation (years) Mean = 23.18; SD = 12.74	Low (<10 years) Medium (10 - 36 years) High (>36 years)	17 (14.17) 84 (70.00) 19 (15.83)
10.	Marketing orientation Mean = 1.98; SD = 0.18	Low (<1.80) Medium (1.80 - 2.16) High (>2.16)	01 (0.83) 119 (99.17) 0 (0.00)
11.	Economic motivation Mean = 14.28; SD = 0.83	Low (<13.45) Medium (13.45 - 15.11) High (>15.11)	02 (1.67) 109 (90.83) 09 (7.50)
12.	Social participation Mean = 1.65; SD = 0.53	Low (<1.12) Medium (1.12 - 2.17) High (>2.17)	0 (0.00) 118 (98.33) 02 (1.67)

13.	Attitude Mean = 37.17; SD = 2.14	Less favorable (<35.02) Favourable (35.02 - 39.30) Highly favourable (>39.30)	22 (18.33) 74 (61.67) 24 (20.00)
14.	Knowledge level Mean = 48.44; SD = 4.79	Low (<43.65) Medium (43.65 - 53.23) High (>53.23)	02 (1.67) 101 (84.16) 17 (14.17)
15.	Adoption level Mean = 34.67; SD = 2.09	Low (<32.57) Medium (32.57 - 36.75) High (>36.75)	0 (0.00) 111 (92.50) 09 (7.50)

Table 2: Distribution of the respondents based on information source utilization pattern for sustainable king chilli production

Sl. No.	Mass- media sources of information	Frequency of use	Percentage of use (%)	Mean score	Rank
1.	Radio	06	05.00	0.52	III
2.	Television	00	00.00		
3.	Exhibition	03	2.50		
4.	Extension publications (posters, folders, leaflet, etc)	32	26.66		
5.	Newspaper	22	18.33		
Sl. No.	Formal sources of information	Frequency of use	Percentage of use (%)	Mean score	Rank
1.	AFA	75	62.50	2.32	II
2.	AO/SDAO/HO	73	60.83		
3.	KVK	02	1.66		
4.	ATMA	44	36.66		
5.	NGOs	22	18.33		
Sl. No.	Informal sources of information	Frequency of use	Percentage of use (%)	Mean score	Rank
1.	Friends	114	95.00	6.80	I
2.	Relatives	111	92.50		
3.	Neighbours	113	94.16		
4.	Progressive farmers	120	100		

Table 3: Overall utilization of information sources for sustainable king chilli production N= 120

Sl. No.	Category	Frequency	Percentage (%)
1.	Low (less than 6.91)	04	3.33
2.	Medium (6.91 - 12.41)	95	79.17
3.	High(More than 12.41)	21	17.50
	Total	120	100

Mean score = 9.65, SD = 2.74

Table 4: Association of independent variables with information source utilization pattern of the respondents

Sl. No.	Variables	Pearson's correlation coefficient
1.	Age	0.040 ^{NS}
2.	Family size	-0.087 ^{NS}
3.	Education	0.259**
4.	Total area under agriculture (acre)	0.019 ^{NS}
5.	Area under king chilli production (acre)	0.060 ^{NS}
6.	Total annual income	0.111 ^{NS}
7.	Annual income from king chilli	-0.068 ^{NS}
8.	Training exposure	0.620**
9.	Experience in king chilli production (years)	0.031 ^{NS}
10.	Marketing orientation	-0.145 ^{NS}
11.	Economic motivation	0.035 ^{NS}
12.	Social participation	0.183*
13.	Attitude	0.536**
14.	Knowledge level	0.242**
15.	Adoption level	-0.096 ^{NS}

Note: df = (120-2) = 118 r0.05 = 0.179 r0.01 = 0.234

* = Significant at 5% level of significance

** = Significant at 1% level of significance

NS = Non Significant at 5% level of significance

Table 5: Multiple linear regression of predictor variables with information sources utilization pattern of the respondents

Sl. No.	Variables	b	SE(b)	t value	Pr > t
1.	Intercept	5.546	1.353	4.100	0.000
2.	Age	0.044	0.021	2.127*	0.036 (<0.05)
3.	Education	0.668	0.205	3.251**	0.002 (<0.01)
4.	Annual income	0.000	0.000	-0.531	0.596
5.	Social participation	1.033	0.463	2.232*	0.028 (<0.05)

Note: R² = 0.129, F Value = 4.25, **= significant level at 1% α, *=significant at 5% α

Conclusion

Information is an indispensable factor in the development of king chilli farmers in Nagaland. From the above findings it may be concluded that there is enough scope to improve the information source utilization pattern for technology adoption of sustainable king chilli production. The king chilli growers still prefer local source of information which sounds more faith on tested practices including indigenous knowledge with organic inputs but exhibit lack of interest in scientific or modern approaches. The yield and production gap needs to be reduced by strengthening an efficient transfer of technology programme among the farmers. Therefore, the government and the policy makers should invest in further development of these information sources and timely organize field visit, exhibitions, Kisan mela, trainings, exposure trips, demonstration activities, etc. for effective dissemination of sustainable farming practices to the farmers of this region. There is a dire need to educate farmers on the importance of improved farming practices, adaptation of proven and tested production technologies, and better utilization of land holdings through well-coordinated efforts of agricultural research and extension with allied developmental organizations (Boubaker *et al.* 2020) [3]. With the advancement of technology, the farmers should also be educated and made aware of the ICT tools and other available information sources so that farmers can get maximum benefit as and when they need for their sustainable farming operations.

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