Perspectives of Vegetable Growers Towards Eco-friendly Management Practices

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ABSTRACT

Green revolution technologies have more than doubled the yield potential of rice and wheat, especially in Asia. These high input production systems requiring massive qualities of fertilizers, pesticides, irrigation and machines, however, disregard the ecological integrity of land, forests and water resources, endanger the flora and fauna and cannot be sustained over generations. For the present study, an ex-post-facto research design was followed and research was carried out in Pune and Kolhapur districts of Western Maharashtra. The sample size encompassed with 180 vegetable growers. Variables which had direct relevance to the eco-friendly agriculture practices followed in vegetables are carefully chosen for the present research. Henceforth, fifteen independent and two dependent viz. knowledge and adoption were firm up for the current investigation. Precisely rare studies attempted to measure the level of knowledge, adoption and attitude of eco-friendly technologies therefore attempt is made to outing the knowledge test, adoption index and attitude scale towards eco-friendly management. Data composed were administered and categorized by using frequency, percentages, mean, standard deviation, range, coefficient of correlation, coefficient of multiple determination and path analysis. At overall, majority of the respondents have medium knowledge regarding environmental hazards and eco-friendly management practices. Furthermore, less than one third of the sample respondents have low adoption of eco-friendly management practices. Though research put exultant annotation about majority of the respondents have favorable and sensible attitude towards eco-friendly management in the interior of their nurtured vegetables. While majority of the designated independent variables have positive and significant relationship with dependent variables and nearly fifty per cent variation is found in assortment of variables for the existing research. Altogether every independent variable put notable effect on dependent variable directly, indirectly as well as substantially.

Keywords : Environment, Eco-friendly, Attitude.

INTRODUCTION

Green revolution technology as resulted in a phenomenal growth in agricultural productivity; however it treads heavily in the environment. Continuous use of chemical pesticides has severely affected the environment. Pesticide residues in food items and their bio accumulation in the body trigger several health hazards. These indiscriminately used chemical insecticides led to the contamination of water and food sources, poisoning of non-target beneficial insects and development of insect populations resistant to the insecticide. Due to the problems of resistance development in pests and withdrawal of some products for either regulatory or commercial reasons, only a fewer chemical pesticides are available in the market.

Eco-friendly and environmentally friendly are synonyms used to refer to goods and services considered to inflict minimum or no harm on the environment. To make consumers aware environmentally friendly goods and services often are marked with eco-labels. Eco-friendly farming is the process of producing food naturally. This method avoids the use of synthetic chemicals and generally modified organisms to influence the growth of crops. The main idea behind eco-friendly farming is zero impact on environment. It works in harmony with nature rather than against it. This involves musing techniques to achieve good crop yields without harming the natural environment or the people who live and work in it.

Hence, realizing the importance of eco-friendly practices of farming systems that are environmentally sound, profitable production and maintain the social fabric of the rural community, this study was undertaken to divulge the managing aspects of eco-friendly practices in vegetables,

designed with the following specific objectives.

1. To study the personal, socio-economic and psychological characteristics of vegetable growers from Western Maharashtra.

2. To study the extent of knowledge of vegetable growers about environmental hazards and eco-friendly management practices.

3. To find out the relationship between personal, socio-economic, psychological and communication variables of vegetable growers and knowledge level of environmental hazards and eco-friendly practices.

METHODOLOGY

Research study carried out in Pune and Kolhapur districts of Western Maharashtra during the year 2015-2016. An Ex-post-facto research design was followed for the existing study besides the sample size encompassed with 180 vegetable growers which were personally interviewed with a structured and questionnaire pre-tested was used to collect data from vegetable growers. Variables which has direct relevance to the eco-friendly agriculture practices followed in vegetables are carefully chosen for the present research. Henceforth, fifteen independent and two dependent viz., knowledge and adoption were firm up for the current investigation. Precisely rare studies attempted to measure the level of knowledge, adoption and attitude of eco-friendly technologies therefore attempt is made to outing the knowledge test, adoption index and attitude scale towards eco-friendly management. Data composed were administered and categorized by using frequency, percentages, mean, standard deviation, range, coefficient of correlation and coefficient of multiple determination and path analysis.

RESULTS AND DISCUSSION

The results pertaining to personal, socio-economic, psychological and communication characteristics of vegetable growers which are followed eco-friendly practices during last three years were depicted under precisely selected variables and presented in the following tables.

Table 1
Distribution of sample respondents according to their age

Sr. No.	Age (years)	Sample respondents	
		Frequency	Per cent
1	Young age (Up to 35 years)	53	29.44
2	Middle age (36 to 55 years)	68	37.78
3	Old age (56 years and above)	59	32.78
	Total	**180**	**100**

It was found from Table 1 that nearly forty per cent of the respondents belonged to middle age group (37.78%), followed by old age (32.78%) and young age (29.44%) group. These findings are alike to the results of Gupta (2012) and Soni (2014).

Table 2
Distribution of the respondents according to their level of education.

Sr. No.	Education level	Sample respondents	
		Frequency	**Per cent**
1	Illiterate	08	04.44
2	(primary 1st – 4t Std.)	21	11.67
3	Primary education (5th -7th Std.)	46	25.56
4	High School (8th - 10th Std.)	38	21.11
5	Higher Secondary education (11th & 12th Std.)	49	27.22
6	Gradutes (Degree and above)	18	10.00
	Total	**180**	**100.00**

The results (Table 2) reveals that 27.22 per cent of respondents studied up to higher secondary; whereas 25.56 per cent of them were educated up to primary education level. About 21.11 per cent of them had education up to high school level, while 11.67 per cent studies up to pre-primary school level. A meager 10 and 4.44 per cent of them were graduates and illiterate, respectively. These remarks are similar with Manjunath (2014) and Rai (2015).

Table 3
Distribution of the respondents according to their size of land holding.

Sr. No.	Size of land holding (ha)	Sample respondents	
		Frequency	Per cent
1	Marginal (up to 1.00)	37	20.56
2	Small (1.01 to 2.00)	78	43.33
3	Semi-Medium (2.01 to 4.00)	31	17.22
4	Medium (4.01 to 10.00)	19	10.56
5	Big (10.01 and above)	15	8.33
	Total	180	100.00

More than forty per cent (43.33%) of respondents belonged to small farmers' category that possesses only one to two hectares of cultivable land (Table 3) followed by 20.56 per cent of them belonging to marginal farmer category. Moreover 17.22 per cent of them possess land two to four hectares. Merely, 10.56 and 8.33 per cent of them belonged to medium and big farmers' category respectively. These findings are similar with the findings of Chouan *et al.* (2013) and Abbasov (2015).

Table 4
Distribution of the respondents according to their annual income.

Sr. No.	Annual income (Rs.)	Sample respondents	
		Frequency	Per cent
1	Very low (up to 145000)	45	25.00
2	Low (Rs. 145001 to Rs. 204000)	51	28.33
3	Medium (Rs. 2,04,001 to Rs. 263000)	32	17.78
4	High (Rs. 263001 to Rs. 322000)	40	22.22
5	Very high (Rs. 322001 and above)	12	6.67
	Total	180	100.00

The results presented in Table 4 indicates that nearly thirty per cent (28.33%) of te defendants had low level of income between Rs. 1450001 to Rs. 204000, followed by very low (25%), hig (22.22%) and medium level income (17.78%). Only 6.67 per cent respondent possesses more than 3.22 lakhs annually. These findings are similar with the findings of Singh (2011) and Deepthi (2014).

Table 5
Distribution of the respondents according to their achievement motivation.

Sr. No.	Achievement motivation	Sample respondents	
		Frequency	Per cent
1	Very low (Up to 36)	34	18.89
2	Low (37 to 41)	40	22.22
3	Medium (42 to 45)	34	18.89
4	High (46 to 49)	46	25.56
5	Very high (50 and above)	26	14.44
	Total	180	100.00

The Table 5 reveals that 25.56 per cent of respondents had high level of achievement motivation, followed by low (22.22%), medium (18.89%), very low (18.89%) and very high (14.44%) achievement motivation categories, respectively. The findings is analogous to the results of Deepthi *et al.* (2014).

Table 6
Distribution of the respondents according to their innovative proneness.

Sr. No.	Innovative proneness	Sample respondents	
		Frequency	**Per cent**
1	Very low (Up to 28)	36	20.00
2	Low (29 to 34)	52	28.89
3	Medium (35 to 41)	36	20.00
4	High (42 to 47)	35	19.44
5	Very high (48 and above)	21	11.67
	Total	**180**	**100.00**

The data depicted in Table 6 revealed that near about thirty per cent (28.89%) of respondents had law level of innovative proneness, followed by very low and medium (20%) and high innovative proneness category (19.44%), respectively. Only 11.67 per cent respondents were found very highly innovative. This findings is alike with the findings of Gautam *et al.* (2014) and Hudak (2015)/

Table 7
Distribution of the respondents according to their scientific orientation.

Sr. No.	Scientific orientation	Sample respondents	
		Frequency	**Per cent**
1	Very low (Up to 11)	19	10.56
2	Low (12 to 16)	42	23.33
3	Medium (17 to 21)	57	31.67
4	High (22 to 25)	44	24.44
5	Very high (26 and above)	18	10.00
	Total	**180**	**100.00**

From Table 7 it was found that more than thirty (31.67%) of respondents had medium scientific orientation. Besides, 24.44 and 23.33 per cent of them belonged to high and low scientific orientation category, respectively. Further, merely 10 per cent respondents categorized under very low and very high orientation separately. These findings are similar with the findings of Bacchav (2013) and Tey (2015).

Table 8
Distribution of the respondents according to their risk orientation.

Sr. No.	Risk orientation	Sample respondents	
		Frequency	**Per cent**
1	Very low (Up to 12)	27	15.00
2	Low (13 to 16)	31	17.22
3	Medium (17 to 20)	34	18.89
4	High (21 to 25)	51	28.33
5	Very high (26 and above)	37	20.56
	Total	**180**	**100.00**

From the Table 8, it is observed that majority of the respondents (28.33%) belonged to high risk orientation, whereas, 20.56 per cent and 18.89 per cent of them belonged to very high and medium risk orientation category, respectively. Risk orientation of the respondents was set up jeopardy in adopting eco-friendly performs is found moderately influenced and this might be because of the respondents also having equal willingness to avail risk towards other means of vegetable cultivation. These findings are analogous with the discoveries of Sudheer (2011) and Riungu (2015).

Table 9
Distribution of the respondents according to their cosmopoliteness.

Sr. No.	Cosmopoliteness	Sample respondents	
		Frequency	Per cent
1	Very low (Up to 4)	16	08.89
2	Low (5)	34	18.89
3	Medium (6)	50	27.78
4	High (7)	48	26.67
5	Very high (8)	32	17.78
	Total	180	100.00

From the Table 9, the results revealed that 27.78% of respondents belonged to medium category of cosmopoliteness. Whereas, 26.67 and 18.89 per cent of them belonged to high and low cosmopoliteness followed by 17.78 per cent and 8.89 per cent respondents placed in very high and very low category. These findings are similar with the findings of Probst (2011) and Borua *et al*. (2015).

Table 10
Distribution of the respondents according to their economic motivation.

Sr. No.	Economic motivation	Sample respondents	
		Frequency	Per cent
1	Very low (Up to 12)	22	12.22
2	Low (13 to 16)	33	18.33
3	Medium (17 to 21)	39	21.67
4	High (22 to 25)	57	31.67
5	Very high (26 and above)	29	16.11
	Total	180	100.00

From Table 10, it was found that 31.67 per cent of respondents belonged to high economic motivation, while 21.67 and 18.33 per cent of tem belonged to medium and low economic motivation category, respectively. However, 16.11 and 12.22 per cent respondents independently placed in very high and very low categorization of economic motivation. These findings are similar with the findings of Adjrah *et al*. (2013) and Holmer (2013).

Table 11
Distribution of the respondents according to their hazard knowledge.

Sr. No.	Knowledge category	Sample respondents	
		Frequency	Per cent
1	Very low (Up to 10)	20	11.11
2	Low (11 to 14)	38	21.11
3	Medium (15 to 17)	63	35.00
4	High (18 to 21)	43	23.89
5	Very high (22 and above)	16	8.89
	Total	180	100.00
	Mean – 14.32	**Standard deviation – 3.14**	

The data in the Table 11 reveals that, the medium knowledge of environmental hazards was noticed among 35 per cent of the respondents, whereas high knowledge was exhibited by 23.89 per cent of them, followed by low knowledge among 21.11 per cent of the vegetable growers. Only 8.89 per cent of knowledge is possessed by very high level vegetable regarding environmental hazards.

Table 12
Distribution of the respondents according to eco-friendly knowledge.

Sr. No.	Practices	Sample respondents	
		Frequency	Per cent
1	**Cultural control**		
a	Summer deep ploughing	180	100.00
b	Growing mustard / Marigold/ Rape seed as trap crop	151	83.89
c	Crop rotation with leguminous crops	132	73.33
d	Inter crops in vegetables	79	43.89
e	Seed treatment chemicals	180	100.00
f	Identification of pests	142	78.89
2	**Mechanical control**		
a	Hand picking of larvae	159	88.33
b	Monitoring of pest	180	100.00
c	Uprooting alternate host plants	73	40.56
d	Use of pheromone traps	83	46.11
e	Use of light traps	76	42.22
3	**Biological pest control**		
a	Conservation and encouraging of predators	28	15.56
b	Conservation and encouraging of parasitic wasps	17	9.44
c	Use of NPV and concentration of spray	68	37.78
d	Introduction of bio-control agents	26	14.44
4	**Use of bio-pesticides**		
a	Knowledge about neem seed kernel extract	102	56.67
b	Preparation of neem seed kernel extract	99	55.00
c	Concentration of neem seed kernel extract	89	49.44
d	Frequency of spraying neem seed kernel extract	91	50.56
5	**Application of organic manures**		
a	Farm yard manure/green manure/vermicompost	180	100.00
b	Press mud/seed cake	112	6.22
6	**Use of inorganic fertilizers**		
a	Application of recommended dose	144	80.00
b	Time of application	157	87.22
c	Method of application	169	93.89

The results in Table 12 revealed that cent per cent of the farmers had knowledge about summer deep ploughing and seed treatment with chemical as a control measure of pests. A great majority of the vegetable growers possessed the knowledge of growing mustard/marigold/rape seed as trap (83.39%) and identification of pests (78.89%). More than two-third (73.33%) of the respondents had knowledge about crop rotation with leguminous crops. Whereas, 43.89 per cent of respondents and knowledge about growing intercrops in vegetables.

With regard to mechanical control measures, cent per cent of the respondents know about monitoring of pests and majority of the farmers (88.33%) did know about te and picking of larvae from vegetables. More than forty per cent of the respondents had known about pheromone traps (46.11%), use of light traps (42.22%) and uprooting alternate host plants (40.56%).

In case of biological control measures more than thirty per cent (37.78%) of the farmers know about the use of NPV and concentration of spray. A fewer quantity of farmers discern about conservation and encouraging of predators (15.56%), introduction of bio-control agents (14.44%) and conservation and encouraging of parasitic wasps (9.44%).

Table 13
Contribution of independent variables with environmental hazard knowledge

Code No.	Characteristics	Regression coefficient	Standard error	't' value
X_1	Age	-0.0048	0.0069	-0.5648
X_2	Education	0.1389*	0.64	2.1654
X_3	Land holding	-0.0048	0.0469	-0.065
X_4	Annual income	0.0348	0.0756	0.6234
X_5	Achievement motivation	0.0054	0.057	0.5641
X_6	Innovative proneness	0.0645**	0.064	1.9867
X_7	Scientific orientation	0.0436	0.062	1.0689
X_8	Risk orientation	0.015	0.0341	0.256
X_9	Deferred gratification	0.016	0.0231	0.6998
X_{10}	Cosmopoliteness	-0.0259	0.065	-0.6545
X_{11}	Economic motivation	0.025	0.0321	0.1689
X_{12}	Attitude towards chemical fertilizers	0.019	0.0236	1.2358
X_{13}	Extension participation	0.125	0.076	2.0014
X_{14}	Institutional participation	0.0215	0.0023	0.0235
X_{15}	Mass media use	0.0569	0.0256	1.0256

R2 = 0.4782   *F value = 2.594***   *DF = (15, 145)*
* Significant at 5 level.   *** Significant at 1 level.*

The results presented in Table 13 revealed that, two independent variables namely education and innovative proneness were significant at 5 per cent and 1 per cent level of probability, respectively in influencing the level of knowledge of environmental hazards. Hence, these two variables could be termed as good predictors concerning to the knowledge of environmental hazards possessed by the vegetable growers.

The "F" value was significant and co-efficient of determination was "0.4782", which revealed that 47.82 per cent of variation in the knowledge level of environmental hazards was explained by the variables selected for the study.

This indicated that the selected variables could explain nearly fifty per cent of the variation in the knowledge and remaining variation could be attributed to some other variables which were not indicated in the study. Even there was significant change in the knowledge of farmers towards environmental hazards by vegetable growers can be brought about by bringing positive changes in these two variables.

This leads to the conclusion that innovative proneness and education had significantly contributed to increase in knowledge of environmental hazards of the vegetable growers.

CONCLUSION

From the results and findings of personal profile of the vegetable growers it can be concluded that average adopters were auxiliary energetic, knowledgeable, dynamic and having more interest in adopting modern vegetable technologies. As majority of vegetable growers were middle aged, this group should be imparted training, so that they can act as catalyst in motivating other growers through communication networks with reference to adoption as well as dissemination of eco-friendly management.

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