



Research Article

ADOPTION DYNAMICS OF ENVIRONMENT FRIENDLY PRACTICES (EFP) IN VEGETABLE CULTIVATION IN MADHYA PRADESH

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Abstract- This study was conducted in Indore district of Madhya Pradesh with the sample size of 120 respondents. The findings revealed that use of pheromone trap (10.83%), use of light trap (12.5 %), Conservation and encouraging of predators (0.83 %), Use of NPV and concentration of spray (4.16 %), Introduction of bio-control agents (10.00 %), Preparation of seed kernel extract (5.83 %), Knowledge about neem seed kernel extract (16.83 %) vegetable growers adopt eco-friendly practices in vegetables cultivation. The area under vegetable crops in Indore district of Madhya Pradesh was about 33.77 thousand hectares in 2010-11, which increased to 6.23 thousand hectares in 2011-12. The production of vegetable crops in Indore district was about 599307 metric tonne in 2010-11 and further increased to 29753 metric ton in 2011-12. (Horti.Dept, M.P.).

Keywords- Eco-friendly farming, Vegetable growers, Adoption dynamics

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Introduction

Eco-friendly farming produces crops naturally. This method avoids the use of synthetic chemicals and pesticides, to influence the growth of crops. Basic concept behind eco-friendly farming is Zero impact on surrounded environment. It maintains the balance with nature rather than against it. This involves using techniques to achieve maximum crop yields without disturbing the natural environment and people who live and work in it.

Management of eco-friendly farming is paying attention on the whole farm system and its communicative relationship with climate, environment, social as well as economic conditions, rather than considering the farm as a point or group of individual enterprises. Careful attention to the impact of the farming system and its different aspects on the whole environment and the conservation of wildlife and natural habitats (Meena et.al, 2005)[1-2].

About 70 per cent of pesticides and chemicals have been used in developing countries and remaining 30 per cent in developed countries. More than 1000 of agro-chemicals synthetic fertilizers are being manufactured and used for agriculture as well as public health purposes. About 90 per cent of above quantity of agro-chemicals consists of insecticides and herbicides with about equal share each, out of which fungicides represent about 10 per cent of the total. Utilization of pesticides in India is increasing at the rate of two to five per cent per annum, which is actually three per cent of total pesticides used in the world. About 90,000 metric tonnes of technical grade pesticides have been produced out of which more than 67 per cent is used in agriculture sector alone (Meena et.al, 2005) [1-2]. Adoption dynamics express the rate of adoption correspondent with the system ability to cope with it. The increased production of vegetables by way of adoption of new

technologies necessitated modernization of industry, thereby, boosting the agriculture based economy.

Materials and Methods

The study was conducted in Indore district of Madhya Pradesh. Indore district comprises of four blocks namely, Depalpur, Saver, Indore, Mahow. An extensive survey was conducted in vegetables growing villages. A sample of 120 vegetable growers was drawn from 10 vegetable growing villages using proportionate random sampling technique. Based on the expert's opinion, recommended vegetable cultivation practices were selected for studying the extent of adoption. All the farmers who were personally interviewed by using a well-structured interview schedule. In this study for the analysis of collected data, descriptive statistics (i.e. frequency and percentage) and analytical statistics was used.

To study the socio-economical, personal, Psychological and communicational attributes of vegetable growers:

The variables selected and studied as independent variables were age, annual income, socio-economic status, economic motivation, attitude towards use of eco-friendly management practices, marketing orientation, mass media exposure, extension participation, information seeking behaviour, knowledge of eco-friendly management practices, and are presented here. In order to know the background and socio-economic status of the respondents, it is important to document these characteristics. So collectively, socio-economic variables were studied using appropriate tools. The analyze data showed that majority (59.17 %) of the respondents were from middle age group (36-50 years). This result reveals in the

line of work of Meena *et al.* (2005), Pyasi, R.D. (2009) and Natya, V.K. (2011)[1,3,5]. Higher percentage of respondents (60.83%) had low annual income (Up to Rs. 50,000/-), followed by 21.67 per cent growers had medium annual income (Rs. 50,001 to 1,00,000/-), and 17.50 per cent growers had high annual income group (above Rs. 1,00,000/-). This finding has conformity with Natya, V.K. (2011) & Patel; G.P. (2007)[3,4]. Majority (62.50%) growers had medium farmers (2.10 to 5.00 ha.) of cultivable land under vegetable crops. The highest proportions of the respondents (35.00 %) were Can read and write, whereas 21.66 per cent were middle & up to higher secondary, 15.86 per cent were up to 5th class, 5.00 per cent were illiterate and only 0.84 per cent were graduate. Majority (36.67%) of vegetable growers were solely engaged in vegetable production as their main occupation followed by 34.14 percent had done vegetable cultivation + shop keeping. The work of Pyasi, R.D. (2009) and Natya, V.K. (2011) [3,5] is in support this finding.

Table-1 Profile of the vegetables growers

S.N	Variables	Frequency	Percentage (%)
1.	Age		
	Young (21 to 35 years)	30	25.00
	Middle (36 to 50 years)	71	59.17
	Old (above 50 years)	19	15.83
2.	Annual income		
	Low income (Up to Rs. 50,000/-)	73	60.83
	Medium income (Rs. 50,001 to 1, 00,000/-)	26	21.67
	High income (Above Rs. 1, 00,000/-)	21	17.50
3.	Land Holding		
	Marginal (Up to 1.00 ha)	07	05.83
	Small (1.10 to 2 ha)	11	09.17
	Medium (2.1 to 5 ha)	75	62.50
	Large (above 5 ha)	27	22.50
4.	Education		
	Illiterate	06	05.00
	Can read and write	42	35.00
	Primary school	19	15.85
	Middle school	26	21.66
	Higher secondary	26	21.66
	College	01	0.83
5.	Occupation		
	Vegetable production + labours	05	04.17
	Vegetable production + Business (Caste occupation + Dairy)	25	20.83
	Vegetable production + Shop keeping	41	34.16
	Solely vegetable production	44	36.67
	Vegetable production + Services	05	04.17
6.	Socio-economic status		
	Low (24 to 36 score)	25	20.83
	Medium (37 to 49 score)	76	63.33
	High (above 49 score)	19	15.84
7.	Economic Motivation		
	Low (4 to 6 score)	33	27.50
	Medium (7 to 9 score)	70	58.33
	High (above 9 score)	17	14.17
8.	Knowledge Level		

Low (1 to 5 scores)	77	64.17
Medium (6 to 10 scores)	26	21.66
High (above 10 scores)	17	14.17

Out of total vegetable growers, 63.33 per cent were having medium socio-economic status, followed by 20.83 per cent low and 15.84 per cent had high socio-economic status. Majority 58.33 per cent had medium economic motivation, followed by 27.50 per cent had low and 14.17 per cent vegetable growers had high economic motivation. Majority of growers (85.83%) were having low to medium knowledge of vegetable production practices, while only 14.17 per cent were having high knowledge of practices.

Table-2 Participation of vegetables growers in Extension Activities

S.N	Variables	Frequency	Percentage (%)
1.	Social participation		
	Low (Up to 4 score)	26	21.67
	Medium (5 to 9 score)	67	55.83
	High (Above 9 score)	27	22.50
2.	Mass media exposure		
	Low (1 to 8 score)	75	62.50
	Medium (9 to 16 score)	26	21.67
	High (above 16 score)	19	15.83
3.	Extension Participation		
	Low (2 to 8 score)	40	33.33
	Medium (9 to 15 score)	63	52.50
	High (above 15 score)	17	14.17
4.	Information seeking behavior		
	Low (4 to 8 score)	25	20.83
	Medium (9 to 13 score)	73	60.83
	High (above 13 score)	22	18.34
5.	Market orientation		
	Low (1 to 5 score)	63	52.50
	Medium (6 to 10 score)	36	30.00
	High (above 10 score)	21	17.50

The data of [Table-2] indicate that out of total vegetable growers, 55.83 per cent had medium social participation, followed by 22.50 and 21.67 per cent of respondents had high and low social participation in the activities of different social organizations respectively. The works of Natya, V.K. (2011)[3] also supports the present. Majority (62.50 %) were in the category of low mass media exposure, followed by 21.67 per cent had medium and only 15.83 per cent vegetable growers had high mass media exposure. Higher percentage of vegetable growers (52.50%) had medium exposure with extension participation and 33.33 per cent had low extension participation. This finding has conformity with Pyasi, R.D. (2009) and Patel (1989)[5,4]. Majority of vegetable growers (60.83%) had medium Information seeking behaviour and 20.83 per cent had low Information seeking behaviour. Thus, it may be concluded that higher percentage of vegetable growers (52.50%) had low marketing orientation and 30.00 per cent had medium marketing orientation.

Adoption dynamics of Environment-friendly technologies in vegetable cultivation by vegetables growers

The table indicated that per cent of the respondents had adoption about summer deep ploughing (Ranked I), growing mustard/ marigold/ rapeseed as trap crop at ranked XII (25.00%), crop rotation with vegetable crops at ranked VI (58.33%), inter cropping in vegetable at ranked XI (29.16%). A great majority of the

vegetable growers possessed the knowledge of seed treatments with chemicals as a control measure of pest at ranked VII (54.16%), disease resistance varieties/hybrids in vegetables at ranked IX (41.66% of respondents), hand picking of larvae at ranked XVII (8.33%), monitoring of pest at ranked X (33.33%), uprooting alternate host plant at ranked VIII (43.33%), use of pheromone trap at ranked XIX (6.66%), use of light trap at ranked XVIII (7.50%), conservation and encouraging of predators at ranked XXIV (0.83%), conservation and encouraging of parasitic wasps at ranked XXIII (1.66%), use of NPV and concentration of spray at ranked

XXII (4.16%), introduction of bio-control agents at ranked XVI (10.00%), knowledge about neem seed kernel extract at ranked XV (16.66%), preparation of neem seed kernel extract at ranked XX (5.83%), concentration of neem seed kernel extract at ranked XXI (5.00%), frequency of spraying neem seed kernel extract at ranked XIV (17.50%), farmyard manure/ green manure/ vermin compost at ranked III (91.66%), press mud/seed cake at ranked XIII (20.83%), application of recommended dose at ranked V (66.66%), time of application at ranked IV (75.00%) and method of application at ranked II (94.16%).

Table-3 Distribution of respondents according to their adoption of technology

S. No	Practices	Frequency	Percentage	Rank
1	Cultural control:			
a.	Summer deep ploughing	120	100.00	I
b.	Growing mustard/marigold/rape seed as trap crop	30	25.00	XII
c.	Crop rotation with vegetable crops	70	58.33	VI
d.	Inter crops in vegetable	35	29.16	XI
e.	Seed treatment with chemicals	65	54.16	VII
f.	Disease resistant varieties/hybrid in vegetable	50	41.66	IX
2	Mechanical control:			
a.	Hand picking of larvae	10	8.33	XVII
b.	Monitoring of pest	40	33.33	X
c.	Uprooting alternate host plant	52	43.33	VIII
d.	Use of pheromone traps	08	6.66	XIX
e.	Use of light traps	09	7.50	XVIII
3	Biological pest control:			
a.	Conservation and encouraging of predators	01	0.83	XXIV
b.	Conservation and encouraging of parasitic wasps	02	1.66	XXIII
c.	Use of NPV (NucleoPolyhydroxi Virus) and concentration of spray	05	4.16	XXII
d.	Introduction of bio-control agents	12	10.00	XVI
4.	Use of bio-pesticides:			
a.	Knowledge about neem seed kernel extract	20	16.66	XV
b.	Preparation of seed kernel extract	07	5.83	XX
c.	Concentration seed kernel extract	06	5.00	XXI
d.	Frequency of spraying neem seed kernel extract	21	17.50	XIV
5	Application of organic manures:			
a.	Farmyard manure	110	91.66	III
b.	Press mud/seed cake	25	20.83	XIII
6	Use of inorganic fertilizer:			
a.	Application of recommended dose	80	66.66	V
b.	Time of application	90	75.00	IV
c.	Method of application	113	94.16	II

As close examination of the [Table-4] revealed that majority of the respondent adopted deep summer ploughing, application of farmyard manure. Whereas, majority of the farmers adoption of seed treatments with chemicals as a control measure of pest, time of application and recommended dose of inorganic fertilizers, crop rotation with vegetable crops and disease resistance varieties/hybrids in vegetables.

The practice of components which are technically skill orientated are very low adoption namely pheromone traps, light traps, biological pest control measures, which consists of conservation and encouraging predators and parasitic wasps and introduction of bio-control agents.

Association between attributes of vegetable growers with their adoption of

eco-friendly management practices

From the data depicted in [Table-4], it is clear that correlation coefficient of variables viz., age, Annual income, Economic motivation, Extension participation were significant at 0.05 level of probability with adoption of eco-friendly technology in vegetables and Socio-economic status, mass media exposure, Information seeking behavior and knowledge level were significant at 0.01 level of probability with adoption of eco-friendly technology in vegetables. The findings reveals that age, annual income, economic motivation, mass media exposure, extension participation, information-seeking behavior, knowledge level had significant. Marketing orientation was non-significant at 0.05 level of probability with adoption of eco-friendly technology in vegetables.

Table-4 Association between attributes of vegetable growers with their adoption of eco-friendly management practices:

S.No	Variables	χ^2 Value	Association with adoption	Degree of freedom	Level of probability
1.	Age	$\chi^2 = 11.783$	Significant	4 d.f	0.05
2.	Annual income	$\chi^2 = 10.93$	Significant	4 d.f	0.05
3.	Socio-economic status	$\chi^2 = 14.29$	Significant	4 d.f	0.01
4.	Economic motivation	$\chi^2 = 12.28$	Significant	4 d.f	0.05
5.	Marketing orientation	$\chi^2 = 7.268$	Non-significant	4 d.f	0.05
6.	Knowledge about eco-friendly management practices	$\chi^2 = 16.28$	Significant	4 d.f	0.01
7.	Mass media exposure	$\chi^2 = 13.39$	Significant	4 d.f	0.01
8.	Extension participation	$\chi^2 = 10.42$	Significant	4 d.f	0.05
9.	Information seeking behaviour	$\chi^2 = 13.78$	Significant	4 d.f	0.01

Conclusion:-

On the basis of above-said discussion, it is concluded that majority of the respondents were practicing cultural practices like deep ploughing in summer, crop rotation, use of pest and disease resistant varieties/hybrids and maximum were followed the weed management practices. Whereas, some of the farmers were practicing mechanical management, biological pest control and use of bio-pesticides during integrated pest management practices in vegetable cultivation. With respect to adoption of integrated nutrient management, maximum numbers of the respondents have not adopted the practices such as applying organic manures, inter cropping, inter cultivation practices, application of bio-fertilizers to soil and use of limited inorganic fertilizers. The findings of this investigation will help the extension system to redesign the activities for the transfer of technologies in vegetable cultivation, productivity, marketing and socio-economic status of vegetable growers and outcome of above findings will help the policy makers, administrators and planners to suit the existing situation in eco-friendly cultivation practices

Conflict of Interest: None declared

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