

# Functional analysis of cotton growers' attitude towards integrated weed management practices

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## ABSTRACT

This study was carried out in Vadodara district of Gujarat state with the specific objective to study the attitude of cotton growers regarding integrated weed management practices, which revealed that majority (90.82 %) of the cotton growers had favourable to most favourable attitude towards integrated weed management practice, independent variables likes extension participation, mass media exposure, scientific orientation, risk preference, and economic motivation exerted positive and significant influenced on attitude of cotton growers in relation to integrated weed management practices. Extension participation had exerted maximum positive indirect effect on attitude of cotton growers and the first order substantial positive indirect effect on attitude was put forth by scientific orientation followed by land holding and economic motivation. Whereas the second order substantial positive indirect effect on attitude was put forth by scientific orientation, risk preference and mass media exposure. However, economic motivation + scientific orientation accounted for 46.90 per cent change in dependent variable.

## INTRODUCTION

Integrated weed management (IWM) is the latest concept in India and it is viewed as an entirely safe technique to the environment. In recent years, concerns have been raised over the effect of overuse of weedicides on environment and human health. Integrated weed management can be used as an alternative to chemicals. This will obviously reduce exposure of the legal, environmental and public hazards of weedicides. There are wide scopes of the Indian farmers to adopt IWM approach of weed control for sustainable agriculture. On other hand, farmers might be facing the problems in adoption of integrated weed management (IWM) practices. Therefore, there is a need to analyze the situation and factors those responsible for not obtaining the desired rate of adoption pertaining to IWM approach. For the adoption of recommended IWM practices, there must be positive attitude of cotton growers towards integrated weed management practices of weed

management. Hence, greater emphasis should be laid on educating the farmers particularly on sustainable agricultural productivity with judicious use of integrated weed management practices. One way by which extension scientist can contribute to this task, is to find out better ways and means of promoting IWM approach among the group of cotton growers. Since, change in knowledge and attitude preceded adoption of an innovation, it is therefore, always important to find out the factor responsible for changing attitude of cotton growers towards integrated weed management practices. Keeping this view in mind, the present study was carried out with the following objectives.

- To study the attitude of cotton growers towards integrated weed management practices.
- To find out the relationship between profile of cotton growers and their attitude towards integrated weed management practices.
- To study the extent of variation explained by different

characteristics of the cotton growers on their attitude towards integrated weed management practices.

- To study the direct and indirect effect of characteristic of the cotton growers on their attitude towards integrated weed management practices in cotton.

## MATERIAL AND METHODS

The present study was conducted in Vadodara district of Gujarat state. Twelve villages from two talukas of Vadodara district with higher potentiality of cotton cultivation were selected for the study. Ten respondents from each selected villages were selected randomly and thus total 120 farmers were taken as respondents.

Suitable and appropriate scales developed by past researchers were used for the measurement independent variables and dependent variable in light of the derived objectives. The data were collected through personal interview and then were compiled, tabulated and analyzed to get proper answer for the specific objectives of the study with the help of various appropriate statistical tools to test the hypotheses under study.

## OBSERVATIONS AND ANALYSIS

The data presented in Table 1 revealed that a great

majority (74.16%) of the cotton growers had favourable attitude towards integrated weed management, followed by 16.68 per cent and 09.16 per cent of them had most favourable and neutral towards integrated weed management practices, respectively. None of the cotton growers falls under the categories of most unfavourable attitude and unfavourable attitudes.

From Table 2 it can be said that among independent variables, extension participation, mass media exposure, scientific orientation, risk preference, and economic motivation exerted positive and significant influence on attitude of cotton growers in relation to integrated weed management practices whereas age and social participation had negative but significant correlation with their attitude. But in case of education and knowledge of the cotton growers, they failed to show any significant influence on their attitude towards integrated weed management practices whereas land holding and annual income of the cotton growers had negative and non-significant correlation.

From Table 3 it can be observed that out of 11 independent variables only 2 (economic motivation and scientific orientation) were acquainting influence on the attitude of cotton growers towards integrated weed management practices in cotton. Both of the two variables together were contributing 46.90 per cent variation as indicated by ( $R^2$ ) value for the extent of adoption pertaining to integrated weed management

Sr. No.	Category of attitude	Respondents	
		Frequency	Per cent
1.	Most unfavourable (14 to 25.20)	00.00	00.00
2.	Unfavourable (25.21 to 34.40 score)	00.00	00.00
3.	Neutral (34.4 to 47.60 score)	11.00	09.16
4.	Favourable (47.61 to 58.80 score)	89.00	74.16
5.	Most favourable (58.80 to 70.00 score)	20.00	16.68
	Total	80	100.00

Sr. No.	Independent variables	Correlation co-efficient ('r' value)
1.	Age	-0.27**
2.	Education	0.11NS
3.	Social participation	-0.242**
4.	Extension participation	0.266**
5.	Mass media exposure	0.198*
6.	Land holding	-0.016NS
7.	Annual income	-0.109NS
8.	Scientific orientation	0.623**
9.	Risk preference	0.423**
10.	Economic motivation	0.472**
11.	Knowledge	0.173NS

\* and \*\* indicate significance of values at P=0.05 and P=0.01, respectively

NS=Non-significant

practices in cotton.

It can be inferred that 38.80 per cent variation in the attitude of cotton growers towards integrated weed management practices contributed by economic motivation. However, economic motivation + scientific orientation accounted for 46.90 per cent change in dependent variable. The R<sup>2</sup> values at each stage of step up regression were found to be significant at 0.01 level of probability.

The partial 'b' values of these two variables were converted in to standard partial 'b' values which were 0.457 for economic motivation and 0.333 for scientific orientation. The 't' value or partial 'b' values were significant in case of both the independent variables.

According to the highest to lowest standard partial 'b' values, the rank orders were given first to economic motivation and second to scientific orientation.

It can be inferred from the above results that, the independent variables such as economic motivation and scientific orientation contributed 46.90 per cent variation in the attitude of cotton growers towards integrated weed management practices in cotton. The findings are suggestive of the fact that for changing the extent of attitude of cotton growers towards integrated weed management practices in cotton, such variables should be reckoned.

**Total indirect effect :**

So far, total indirect effect is concerned extension participation (0.3433) had exerted maximum positive indirect

effect followed by risk preference (0.2346) and scientific orientation (0.1852). Whereas, age (-0.2152) was the only single trait that exerted negative and indirect effect on the attitude of cotton growers (Table 4).

**Substantial indirect effect :**

With regards to first order substantial indirect effect, two of each routed through mass media exposure, extension participation and risk preference. The first order substantial positive indirect effect on attitude was put forth by scientific orientation (0.1759) followed by land holding (0.1374) and economic motivation (0.1044) (Table 4).

With regards to second order substantial indirect effect, two of each routed through mass media exposure, social participation and economic motivation. The second order substantial positive indirect effect on attitude was put forth by scientific orientation (0.1426), risk preference (0.0793) and mass media exposure (0.0672).

It could be concluded that out of 22 substantial indirect effects, four routed through mass media exposure, three of each from them routed through risk preference and economic motivation (Table 4).

Further extension participation, risk preference and scientific orientation were the key variables in exerting considerable direct and substantial effect on attitude of cotton growers towards integrated weed management practices. Age was the major trait in determination of attitude level through negative indirect and direct effect whereas extension

**Table 3: Step-wise multiple regression analysis of attitude of cotton growers towards integrated weed management practices**

Sr. No.	Independent variable	Multiple co-relation co-efficient (R)	Co-efficient of determination (R <sup>2</sup> )	'F' values	Partial regression co-efficient (b)	't' value	Standard partial regression co-efficient (SPRC)	Rank
1.	Economic motivation	0.623	0.388** (38.80)	74.85	0.457	3.050	0.248	I
2.	Scientific orientation	0.685	0.469** (46.90)	51.73	0.333	5.735	0.438	II

\*\* indicate significance of value at P=0.01, respectively

**Table 4 : Direct and indirect effect of personal, socio-economic, communicational and psychological characteristic of the cotton growers on attitude towards integrated weed management practices**

Sr. No.	Variables	Direct effect	Total indirect effect	Substantial indirect effect through	
				1	2
1.	Age (X <sub>1</sub> )	-0.0558	-0.2152	0.0355 (X <sub>2</sub> )	0.0230 (X <sub>5</sub> )
2.	Education (X <sub>2</sub> )	0.0668	0.0482	-0.0425 (X <sub>1</sub> )	0.0314 (X <sub>5</sub> )
3.	Land holding (X <sub>3</sub> )	0.1764	0.1604	0.1374 (X <sub>11</sub> )	0.0412 (X <sub>4</sub> )
4.	Annual income (X <sub>11</sub> )	-0.1162	0.0072	-0.0905 (X <sub>3</sub> )	-0.0306 (X <sub>4</sub> )
5.	Social participation (X <sub>4</sub> )	-0.1284	0.1136	0.0424 (X <sub>8</sub> )	-0.0339 (X <sub>11</sub> )
6.	Mass media exposure (X <sub>5</sub> )	0.1430	0.0550	0.0730 (X <sub>6</sub> )	0.0672 (X <sub>2</sub> )
7.	Extension participation(X <sub>6</sub> )	-0.0773	0.3433	-0.0395 (X <sub>5</sub> )	-0.0330 (X <sub>7</sub> )
8.	Risk preference (X <sub>7</sub> )	0.1884	0.2346	0.0804 (X <sub>6</sub> )	0.0793 (X <sub>8</sub> )
9.	Economic motivation (X <sub>8</sub> )	0.2480	0.224	0.1044 (X <sub>7</sub> )	-0.0819 (X <sub>4</sub> )
10.	Scientific orientation (X <sub>10</sub> )	0.4378	0.1852	0.1759 (X <sub>7</sub> )	0.1426 (X <sub>8</sub> )
11.	Knowledge (X <sub>11</sub> )	0.0243	0.1487	0.0083 (X <sub>5</sub> )	0.0055 (X <sub>3</sub> )

participation and scientific orientation of the cotton growers were the key variables which influenced their attitude positively and indirectly. Rajesh (2011) and Raut *et al.* (2012) have also supplied some useful information related to the present investigation.

### Conclusion :

To epitomize the results it can be said that majority of the cotton growers had favourable to most favourable attitudes towards integrated weed management practices. Among the independent variables, extension participation, mass media exposure, scientific orientation, risk preference, and economic motivation exerted positive and significant influence on attitudes of cotton growers in relation to integrated weed management practices whereas age and social participation had negative but significant correlation with their attitude. But in case of education and knowledge of the cotton growers, they failed to show any significant influence on their attitude towards integrated weed management practices whereas land holding and annual income of the cotton growers had negative and non-significant correlation. Out of 11 independent variables only 2 variables (economic motivation + scientific orientation) were acquainting influence on the attitude of cotton growers towards integrated weed management practices in cotton. Both of the two variables together were contributing 46.90 per cent variation as indicated by ( $R^2$ ) value for the extent of adoption pertaining to integrated weed management practices in cotton. So far, total indirect effect is concern, extension participation (0.3433) had exerted maximum positive

indirect effect followed by risk preference (0.2346) and scientific orientation (0.1852). Whereas, age (-0.2152) was the only single trait that exerted negative and indirect effect on the attitude of cotton growers. With regards to first order substantial indirect effect, two of each routed through mass media exposure, extension participation and risk preference. The first order substantial positive indirect effect on attitude was put forth by scientific orientation (0.1759) followed by land holding (0.1374) and economic motivation (0.1044). With regards to second order substantial indirect effect, two of each routed through mass media exposure, social participation and economic motivation. The second order substantial positive indirect effect on attitude was put forth by scientific orientation (0.1426), risk preference (0.0793) and mass media exposure (0.0672).

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