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“An Analysis of the Farmers’ Community Perception and Awareness About Crop Insurance as a Risk Coping Strategy”: A case from Pakistan

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Abstract

The purpose of this study was to assess the awareness and perception of farmers of Pakistan about the crop insurance. This study was conducted in two tehsils* of RajanPur district of Punjab province of Pakistan. Using various statistical tools like arithmetic mean, standard deviation, counting, percentage and analysis of variance, the collected data was analyzed using SPSS. A five-point Likert scale was also used to measure different variables. The findings revealed that majority of the respondents i.e. 64.17% respondents were aware with the term “crop insurance” while the understanding level with crop insurance varied among those who had general awareness about crop insurance i.e. only 29.87 % respondents among those who were aware claimed that they understand well about crop insurance. The major sources of awareness about crop insurance were found to be friends/coworkers and financial institutes. Climatic risk and crop diseases were declared as the most important risks faced by respondents in the study area. There were found considerable misperceptions about crop insurance among farmers i.e. majority of the farmers declared the crop insurance as a scheme which does not compensate their losses as it should be and as well as a kind of a tax which can reduce their income as well as they believed that it is only designed for a specific group of farmers i.e. large scale farmers. Farmers believed that a crop insurance plan with low premium and offering maximum compensation against losses can be acceptable to them. Using ANOVA and CHI SQUARE test, it was found that education and landholdings were significant with the level of awareness while age was not found to be significant with awareness. Before launching crop insurance plans in Pakistan and to make such scheme more

* In some countries of South Asia i.e. Pakistan and India, Tehsil is an administrative division. It is an area of land with a city or town that serves as its headquarters, with possible additional towns, and usually a number of villages.

successful, government institutes related to agriculture can create awareness among farmers about crop insurance and take steps to reduce the misunderstandings and misperception which exist among the farming community. Offering of maximum subsidy from Government of Pakistan can attract the farmers towards crop insurance.

Keywords: Pakistan; Crop Insurance; Risk coping strategy; Awareness; perception.

Introduction

In agriculture the farmers have to face several types of risks like production risk, financing risk and marketing risk of their produce. In order to tackle the risks associated with agriculture, the farmers take different types of measurements like choice of different varieties of plants and animal breeds, crop and animal husbandry and the use of precautionary prevention measures against the adverse weather events such as use of shelter belts & mulching and securing access to supplementary irrigation facilities [1]. Besides these basic tools of coping the risk, crop insurance is an effective tool to manage the risks associated with production of agricultural produce. The risk associated with farmer's production and income can be minimized through crop insurance. Crop insurance is a way through which farmers can protect their income in case of crop failure as it ensures social security, dignity and large investment to improve yield and production [2]. Insurance is an agreement between the insured (farmer) and insurer (any institute) which (fully or partially) transfers the risk from insured to insurer and this agreement causes a reduction in the loss otherwise it would only be faced by the farmers. Although insurance cannot reduce the risk and uncertainty related to agriculture but it can make the losses bearable. Crop insurance provided the farmers a protection against different unavoidable natural hazards and risks related to weather. Crop insurance is a risk coping instrument that is designed to even out agricultural risks. Agriculture is always considered as a risky in nature due to inconsistent weather conditions. Due to these vagaries of climate, farmers face variations in agriculture and still they are unable to deal with it. Since time, farmers have been using different mechanisms to limit these climatic risks like diversification, inter-cropping, crop rotation and other socio-cultural mechanisms i.e. distribution of risks within family business and informal financial arrangements. But these strategies are not helpful to fully mitigate risks. The co-variability of these uncertainties minimizes the adequacy of these traditional methods. In this situation insurance can be used as a management tactic which can stabilize farmer's income and security of agriculture [3]. For developing countries, crop insurance is not only working as a risk coping mechanism but it also facilitating farmers with easy access to more credit, encouraging them to produce high value crops and assures a stable agriculture production and income [4].

Insurance sector in Pakistan:

In 1947, at the time of independence, Pakistan had only 5 domestic and 77 foreign insurance companies and now after 67 years of independence, including 5 Islamic insurance operators, there are 47 insurance companies working in Pakistan. One reinsurer (Government owned) is also operating in Pakistan. The life and non-life insurance business comprises the entire insurance sector. At the end of 2011, this sector stood at Rs.21.8 billion paid up capital and Rs. 434.7 billion in terms of assets. In the same year, this industry reported a premium of Rs. 130 billion. As a proportion to GDP, The insurance penetration in Pakistan is only 0.7% which is considered to be very low as compared to other South Asian countries i.e. India and Sri Lanka with a share of insurance premium to GDP by 5.1% and 1.5% respectively [5].

Agriculture in Pakistan and threats faced by it:

Agriculture occupies great importance in Pakistan's economy as this sector contributes 21% to GDP and employees 45% of total labor force of the country. This sector is also a major supplier of input for other industries/sector in the country. During 2012-13, a growth of 3.3% in agriculture sector was observed [6]. In Pakistan, Important crops which include maize, wheat, rice, cotton and sugarcane accounts for 25.2% of the value added in overall agriculture and 5.4% to GDP. Despite the importance of crop sector, this sector has seen a lot of fluctuation in past. The growth fluctuations can be seen in the table below

**Agriculture growth in agriculture Pakistan (shown in percentage)
(Considering 2005-06 as base years)**

Sector/sub sector	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Agriculture	3.40	1.80	3.50	0.20	2.00	3.50	3.30
Crops	4.40	-1.00	5.20	-4.20	1.00	2.90	3.20
important crops	6.50	-4.10	8.40	-3.70	1.50	7.40	2.30
other crops	2.10	6.00	0.50	-7.20	2.30	-7.70	6.70
cotton ginning	-0.80	-7.00	1.30	7.30	-8.50	13.80	-2.90

(Source: Government of Pakistan 2012-13)

One factor causing fluctuation in the growth rate of agriculture as over and particularly in crop sector is the occurrence of natural hazards like floods and droughts. The shortage of canal water is also a very serious issue in Pakistan agriculture. The performance of agriculture sector, especially the important crop sector is heavily dependent on in time availability of water. From the data provided by Indus river system authority Pakistan, it can be concluded that from 2004-2005 to 2012-2013, crops in Pakistan have faced a severe shortage of water. During 2004-05, the water shortage was recorded 20.6% while a considerable shortage of water was recorded during 2010-2013 as 15%, 13.2% and 13.4% respectively [6]. The worst floods of 2010 and onward destroyed a large area of crops in Pakistan.

Pakistan's vulnerability to natural and human induced disasters is characterized by earthquakes, floods, droughts, cyclones, landslides, sea hazards and a range of complex emergencies [7]. During the worst 2010 flood in Pakistan, 2.1 million hectares land was affected and total losses of Agriculture land & livestock were estimated as 5,045 million USD and irrigation Channels losses were estimated to be 278 million USD. During 2011 floods in Pakistan, 25090 Sq. km area was affected which included 881.03 thousand hectares cropped area. Overall losses of agriculture, livestock and fisheries were estimated to be 1,840 million US dollars [7].

An analysis of the natural disasters during 1987-2011 shows that the major natural disasters faced by Pakistan were floods, earthquake, drought, famine, wind storm and extreme temperature. Up to 2009, the total damages due to the major and minor disasters were recorded 8,016,385 thousand US dollars and only the floods in 2010 caused a loss of 10 billion US dollars total loss [7].

In a country like Pakistan where agricultural production is the major source of income for many poor farmers, the disasters of climatic variation cannot be ignored because in this case, farmers not only bear the crop loss but also become the defaulters of the lending banks. Since the formulation of country, number of committees constituted by government of Pakistan presented their reports on this subject. These reports included Agricultural development bank of Pakistan pilot project with the collaboration of a private insurer, Insurance Association of Pakistan Catastrophe Crop Insurance Scheme proposed to State bank of Pakistan in 1990, Insurance Association of Pakistan Crop Insurance Scheme for flood and Excessive Rain in 1996 and National insurance corporation Comprehensive Crop Insurance Scheme in 1996 [8].

Considering the agricultural situation in Pakistan and the risks and problems faced by the Pakistani farmers and based upon the above mentioned studies, it was concluded by the government of Pakistan that the introduction of crop insurance would be very useful in promoting and adoption of modern techniques in agriculture by small farmers in Pakistan [8]. Despite these conclusions the agricultural experts in Pakistan still remained unable to present a model crop insurance scheme in Pakistan for a long time.

Existing crop insurance schemes in Pakistan:

Currently in Pakistan, there are two crop insurance plans under practice namely State Bank of Pakistan Crop Loan Insurance Scheme and PPAF (Pakistan poverty alleviation fund crop and animal insurance scheme). The details are below:

1-State Bank of Pakistan Crop Loan Insurance Scheme

In Pakistan, Crop loan insurance scheme (CLIS) was launched by State Bank of Pakistan in 2008. The farmers who avail the agricultural loan, they are bound to get assured through this scheme. In Pakistan, currently 3900 agricultural designated branches of 27 commercial, Islamic and micro finance banks are extending agricultural credit to farmers. These institutes are providing loans for the production and development in the agriculture sector i.e. crops production, poultry, livestock, orchards, fisheries, nurseries, apiculture, forestry, etc. [6]. From 2007 to 2012, the total loan extended to farmers was 1249.5 billion Pakistan rupees which were disbursed through different commercial banks, domestic private banks, microfinance banks, Punjab Provincial Cooperative Bank Limited (PPCBL) and ZTBL (Zarai Taraqiati Bank Limited) [6].

All the banks in Pakistan which are extending agricultural credit to farmers are bound to follow the terms and conditions of this scheme while extending loan to farmers having up to 12.5 acres land holdings. Through this scheme the beneficiary of credit (farmers) up to 12.5 acres land holders are insured when they get credit from banks for any of the five important crops. It is a mandatory crop insurance scheme. This scheme of crop insurance is designed to protect the farmers against predefined hazards like excessive rain, frost, hail, flood and diseases of crops. The five pre defined crops on which this scheme is implementable are maize, sugarcane, rice, cotton and wheat. In case of any event of specified natural disaster, the farmers who are accessing the loan are compensated with an amount of three times of their paid premium. The maximum annual premium for this scheme is 2 percent of the loan granted and for small and subsistence farmers the government also provides subsidy. In Pakistan those farmers who don't avail loan from banks are not assured so in case of any natural hazards, as witnessed in recent years, they have to face a lot of financial problems. There is need of any universal crop insurance scheme which can be beneficial to all the farmers whether they avail the loan from financial institutes or not.

2- PPAF (Pakistan poverty alleviation fund crop and animal insurance scheme)

With the strategic partnership and collaboration of Securities and Exchange Commission of Pakistan, International Fund for Agricultural Development (IFAD) and Pakistan Poverty Alleviation Fund (PPAF) have designed and launched a crop and livestock insurance scheme. This insurance scheme is an index-based type of crop insurance which covers certain risks which are associated with weather fluctuations [9]. Swiss Re, an international name of re insurer has agreed to play the role of international reinsurer for this scheme. For the implementation of this scheme, two locations in the arid agricultural zone have been finalized in Punjab province of Pakistan namely Talagang and Soon valley. In these areas the crops are dependent on the rainfall and in case of shortage of rainfall the crops are badly affected so in order to provide the farmers a protection against the fluctuation in rainfall, this scheme is started in this area. The index-based crop insurance scheme is being introduced in Pakistan. For only one crop i.e. wheat was selected and One thousand farmers from both locations were the participants in this scheme [9].

This existing status of crop insurance in Pakistan clearly reveals that in Pakistan, farmers have to face a lot of risks related to their agricultural production while from the government and private sector side; they have been provided very limited options to cope these risks. Keeping this fact in mind, this research was conducted to know the status of awareness among farmers about crop insurance and assess the perception of farmers regarding the crop insurance in Pakistan keeping in mind the following objectives:

Research Objectives:

To identify the awareness level about crop insurance and sources of awareness among the farmers.

To evaluate the perception of farmers towards crop insurance.

To find out the traits of crop insurance which are considered most importance among farmers.

Materials and Methods

For the current study, the population consisted of all the farmers involved in growing food and cash crops in the RajanPur district of Punjab province of Pakistan. According to 1998 census (The latest available census) of Pakistan, this district has a population of 1103618 persons and occupies an area of 12318SqKms. For the administrative purpose, this district has been divided into 3 tehsils and has total 47 union councils [10]. This district was purposely selected because of its exposure to floods and climatic risks in the past. During recent floods, this district was severely affected and crops on an area of 355,984 acres were affected [11]. Among the four tehsils of this district, two tehsils¹ namely Jampur and Rojhan were randomly selected and from each tehsil, 60 respondents were randomly selected for the purpose of collection of the data. A well-structured questionnaire was employed to carry out a comprehensive survey and the information from the respondents was collected about different variables i.e. age, education level, land holdings, awareness with crop insurance, understanding level with the concept of crop insurance, sources of awareness with crop insurance, perception of farmers regarding crop insurance, perceived risks associated with agriculture and traits of crop insurance. Using various statistical tools like arithmetic mean, standard deviation, counting, percentage and analysis of variance, the collected data was analyzed using SPSS for windows 8 to get an inside picture of the collected data. A five-point Likert scale where “5” was declared as the “most important” and “1” as the “least important” was used to measure different variables.

Results and discussion

(1) Demographic profile of the farmers (respondents)

The profile of the respondent farmers containing their demographics like age, education and land holding size has been described in table 1.

The data shows that most of the respondents were young and having less experience of farming. The farmers were having little education and most of the farmers were having less than 4 acres land holdings.

Table 1: Demographic profile of the respondents:

<i>Characteristics</i>	<i>Respondents</i>	<i>Percentage</i>
<i>Age (years)</i>		
20-35	33	27.5%
36-50	32	26.7%
51-75	31	25.8%
Above	24	20%
<i>Education level</i>		
Primary	73	60.8%
Middle	32	26.7%
High	11	9.17%
Above	04	3.33%
<i>Landholdings (acres)</i>		
Less than 5	75	62.5%
5-12	31	25.8%
More than 12	14	11.7%

(2) Awareness level among farmers:

The respondents of the survey were asked whether they were aware with the concept of crop insurance or not. Among the respondents, 77 farmers (64.17% of the total) mentioned that they had awareness about the crop insurance and remaining 43 farmers (35.83% of the total) mentioned that they had no idea about this term. The results shows that majority of the farmers in the study area had awareness about the crop insurance. Findings are shown below in table 2.

Table 2: Awareness of farmers about crop insurance:

Characteristics	No of farmers(counted)	Percentage
Aware	77	64.17
Not aware	43	35.83

Source: survey data, 2013

n=120

(2.1) Understanding level of crop insurance:

Since 77 farmers were of the view that they had awareness about crop insurance so in order to find out their understanding level with crop insurance and its functions, they were given three choices namely “I know a little”, “I understand well”, “I don’t know well” and they were asked to choose the one which best suit over them. According to the results, 27.27 percent farmers ranked them self as having awareness about crop insurance with a little knowledge, 29.87% farmers ranked themselves as having awareness with crop insurance with well understanding of how it works and the remaining 42.86 percent farmers ranked themselves as having awareness with crop insurance but with a view that they don’t know well about how it works. Results show that majority of farmers have not much understanding with crop insurance and its functions. The results are also shown in the table 3.

Table 3: Understanding of farmers towards crop insurance:

Characteristics	No of farmers(counted)	Percentage
I know a little	21	27.27
I understand well	23	29.87
I don’t know well	33	42.86

Source: survey data, 2013

n=77

(2.2) Sources of awareness:

Respondents of the survey were asked about various sources of information regarding crop insurance and were asked to rate those sources on an important scale as “5” the most important and “1” as the least important. According to the results, the sources of awareness for crop insurance perceived by farmers were E-media, print media, friends/ coworkers, financial institutes, insurance agents and extension staff. The five point Likert scale shows that friends/coworkers and financial institutes were the two most important sources of awareness for the farmers (with mean value of 4.30 and 3.74 respectively) while extension staff was the least important source of awareness declared by the farmers with a mean value of 1.86. The detailed findings are also shown in table 4.

Table 4: Perception of farmers towards importance of various sources of awareness:

	E-media	Print-media	friends/co-workers	financial institutes	insurance agents	extension staff
Mean	2.31	2.08	4.30	3.74	2.02	1.86
Standard deviation	1.38	1.19	0.88	1.24	1.17	1.35

Source: survey data, 2013

n=77

(5=most important and 1=least important)

(3) Perception about crop insurance:

The respondents were asked to describe what they perceive about crop insurance. The respondents were recorded and the respondents were asked to rate them on a five point importance scale. According to the results “kind of a tax”, “subsidy from government”, “designed for a specific group”, “given compensation not satisfactory” and “valuable in terms of time and money” were the important points raised by the farmers. The five point Likert scale shows that

majority of the farmers perceived that the crop insurance schemes were not very useful as the given compensation is not satisfactory and it was declared as the most important perception by the farmers while a considerable number of farmers perceived that the crop insurance was designed for a specific group of farmers i.e. designed only for large scale farmers. The findings are also shown in table 5

Table 5: Perception of farmers towards crop insurance:

	kind of tax	Subsidy from Government	Designed for a specific group	Given compensation is not satisfactory	Valuable in terms of time n money
Mean	4.12	2.03	4.16	4.32	1.94
Standard deviation	1.18	1.38	1.27	1.02	1.31

Source: survey data, 2013

5=most important, 1=least important

(4) Traits perceived by farmers:

The respondents of the survey were asked to describe the traits/feature which must be possessed by any future crop insurance scheme in the study area. They were asked to rate the relative importance on a five point Likert scale. The results show that the farmers perceived low premium and maximum compensation as the two most important traits which should be possessed by any future launched crop insurance scheme in the area. The mean values assigned to both of the features were 4.69 and 4.14 respectively. The detailed results are also shown in table 6.

Table 6: Perception of farmers towards importance of various traits of crop insurance:

	Low premium	Easy procedure/ Documentation	Maximum compensation	Easy access to insurance providers
Mean	4.69	3.32	4.14	2.38
Standard deviation	0.59	1.44	1.14	1.42

Source: survey data, 2013

n=77

(5) Perceived risks by the farmers:

The respondents were asked to state the risks faced by their crops in the study area and also were asked to rate perceived risks on a 3 point importance scale with respect to severity of the perceived risk. Climatic risk and crop disease was given most importance by the farmers with a mean value of 2.73 and 2.39 respectively.

Table 7: Perception of farmers towards importance of various risks faced by their crops:

	Climatic risk	Failure of crop	Crop disease
Mean	2.73	1.9	2.39
Standard deviation	0.52	0.88	0.71

Source: survey data, 2013

3=most important, 1= least important

n= 120

(6) Impact of socio economic factors on the level of awareness:

In order to find out the socio economic factors which affect the awareness level of farmers regarding crop insurance, three hypothesis were developed based on the demographic variables which are below

H1: demographic factor of age has a significant impact on the awareness level of the farmers regarding the crop insurance.

H2: demographic factor of education has a significant impact on the awareness level of the farmers regarding the crop insurance.

H3: demographic factor of land holdings has a significant impact on the awareness level of the farmers regarding the crop insurance.

A comparison of farmers' responses about the awareness with crop insurance with respect to demographic factors such as age, education and land holdings was made with the help of analysis of variance to find out any significant differences in the awareness level. ANOVA test was used to analyze the differences between group means and the variation among and between groups using the below equation. The results are shown in table 8.

$$F = MST/MSE$$

MST = mean square of treatment

MSE = mean square of error

Chi- square or χ^2 -distribution with k degrees of freedom which is the distribution of a sum of the squares of k independent standard normal random variables was used for goodness of fit of an observed distribution to a theoretical one. The below equation was used for this purpose.

$$\chi^2 = \sum_{i=1}^n \left(\frac{n \text{Observed}_i - \text{expected}_j}{\text{expected}_i} \right)$$

Observed I = observed frequency in cell i

Expected j = expected frequency in cell i

N = number of cells

Table 8: Results of the analysis of variance:

Variables	ANOVA		Chi Square	
	F value.	Sig.	Chi square value.	Sig.
Awareness level with respect to Age	1.485	.222	4.437	.218
Awareness level with respect to education	2.203	.091**	6.467	.091**
Awareness level with respect to landholding	3.388	.037*	6.6569	.037*

* Significant at 0.05 level

** Significant at 0.10 level

(6.1) Awareness level with respect to Age:

The insignificant results using ANOVA show that there is no difference of awareness among different age groups. Chi square is also insignificant so the results show that there is no difference of awareness among different age groups. It shows that the age of farmers does not affect the awareness level of the farmers in the study area.

(6.2) Awareness level with respect to education:

While finding the impact of education on awareness, the ANOVA test and Chi square tests were used. The ANOVA results showed a significance relationship between education and awareness that means there exist differences in awareness among different education levels. Chi square Result was also significant that mean there is difference in awareness among different education levels. Farmers with less education had less awareness about crop insurance and farmers with higher education had greater awareness with crop insurance. It shows that education plays an important role in awareness among farmers. From here we can conclude that educated farmers can

understand the information provided to them through different sources of communication in a better way. Keeping in mind this finding, the concerned authorities can disseminate the relevant information in such a manner that farmers with less education may understand well. For this purpose, the local or regional language can be used for this purpose rather than the national language.

(6.3) Awareness level with respect to landholdings:

Using ANOVA, The results were significant at 0.05 level of significance which shows that awareness level varies among different land holdings. Chi square results were also significant at 0.05 level of significance which shows that awareness level varies among different land holdings. The counting method using the primary data collected shows that 70% of farmers having less than 5 acres landholdings were aware about the crop insurance and 45% having 5-12 acres landholdings were also aware with the crop insurance while 71% farmers with landholdings of greater than 12 acres were aware with the crop insurance. Hence the awareness level among >12 acres and less than 5 acres was found greater as compare to 5-12 acres of land holdings.

Result of defined hypothesis in a glance.

The results of the test rejected the 1st hypothesis, accepted the 2nd hypothesis and partially accepted the 3rd hypothesis i.e. the demographic factors of age had no impact on the awareness level, the demographic factor of education had impact on the level of awareness while the demographic factor of land holding had a mix impact on the level of awareness; the awareness level among >12 acres and less than 5 acres was found greater as compare to 5-12 acres of land holdings.

Conclusion

The concept of crop insurance is relatively new in Pakistan. The crop loan insurance is under practice in Pakistan since 2008 but it only provides a cover to farmers against any damage of a proportion of the premium paid by the farmers while getting the loan. This type of insurance is being provided for food crops like wheat, rice, sugarcane, cotton and maize in Pakistan. Index based crop insurance is recently implemented by PPAF in rain fed areas of Pakistan in the Punjab province. Keeping in mind all these factors, the present research work was conducted to assess the awareness level of crop insurance in Pakistan. The study revealed that among a total of 120 farmers, 35.83 % farmers were not aware about the crop insurance while remaining 64.17 % farmers were aware with the term crop insurance. The respondents who were aware with the concept of crop insurance i.e. 77 farmers (64.17% of total sample taken), only 29.87 percent declared that they understand well about the concept of crop insurance and how it works. This shows that most of the farmers in the study area don't know the benefits which they can enjoy by utilizing the crop insurance. This lack of awareness can be overcome by joint efforts of government institutes and insurance companies. The farmers who were aware with the crop insurance, they rated friends/coworkers and financial institutes as two most sources of information regarding crop insurance. This shows that the insurance companies are not properly marketing their crop insurance plans using e-media and other sources of communication. The extension agents can be an important source of disseminating information regarding the benefits of crop insurance and government authorities should direct the extension agents to provide information to farmers. The question regarding the general perception of crop insurance revealed that majority of the farmers consider the crop insurance as it has been designed for specific group of farmers i.e. for land lords as well as farmers also consider it a type of a tax which can reduce their disposable income by causing an additional expense. These concepts can be updated by provision of right information about the crop insurance using various communication tools i.e. proper use of e media because the education level of farmers is low so they can utilize print media properly. The FM radio services can also be used for conveying message to farmers.

The farmers also revealed that any proposed scheme of crop insurance must possess the features of low premium, maximum compensation and easy procedure of documentation. The government and private insurance companies can start crop insurance scheme based on micro finance philosophy and the subsidy from government on premium can attract the farmers towards

crop insurance plans in the study area. The one window operation can be used in order to reduce the long documentation fatigue issues. Major risks perceived by the farmers in the study area were climatic risk and crop diseases so keeping in mind the past data about the disasters faced by farmers, the solution provider crop insurance scheme can be introduced by the private or government sector. The analysis of variance revealed that the education and land holdings had significant impact on the awareness level of the farmers while the age of farmers had no significant impact on the awareness level of the farmers in the study area. The awareness level was found to be increasing with respect to an increase in the education level and greater landholders and small landholders had awareness as compare to medium landholders in the study area.

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