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ORIGINAL RESEARCH ARTICLE

Profitability and prospects of crop insurance of some selected crops in Kishoreganj district of Bangladesh

Nowshin Tabassom Prome[1], Mohammad Ataur Rahman[2*], Ratna Begum[3] and Md. Shishir Ahamed[4]

[1]Department of Agricultural Finance and Banking, Bangladesh Agricultural University, Mymensingh-2202, BANGLADESH
[2]Professor, Department of Agricultural Finance and Banking, Bangladesh Agricultural University, Mymensingh-2202, BANGLADESH
[3]Assistant Professor, Department of Agricultural Finance and Cooperatives, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Gazipur-1706, BANGLADESH
[4]Assistant Professor, Department of Agribusiness and Marketing, Bangladesh Agricultural University, Mymensingh-2202, BANGLADESH

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ABSTRACT

Crop insurance is an essential tool for managing risk in agriculture. The primary goal of this study was to investigate how farmers felt about crop insurance and their willingness to pay for it. . The study was conducted to profile the socioeconomic characteristics, measure the profitability of crops, assess farmer's willingness to pay crop insurance, and determine the factors that influence willingness to pay (WTP). A total of 107 farmers were chosen at random from Kishoreganj district in Bangladesh. The data were collected through a field survey using a semi-structured interview schedule. Karl Pearson's correlation coefficient method was used. The study found that the majority of farmers have only had primary education or less. About one-third of the respondents could make savings of ten to twenty thousand taka each year. The most profitable crops were vegetables, jute, and wheat. Rice's profitability, however, was hardly positive. Factors such as age, education, occupation, net income, and cultivable area have a positive correlation with the WTP for crop insurance for all crops except rice. However, the uptake of crop insurance is still relatively low in Bangladesh, and more efforts are needed to increase awareness and promote the benefits of crop insurance among farmers.

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INTRODUCTION

After independence, the agriculture sector was Bangladesh's main economic driver. Around 60% of the GDP was contributed by it. Agriculture in Bangladesh is vital for people's livelihoods, employment, and contribution to GDP. But its contribution has reduced over the last decade, going from 17 percent in 2010 to 12.6 percent in 2020 (BBS, 2022). This sector is crucial to our economy because it reduces poverty and ensures food security. The sector has, however, remained resilient in terms of profitability and productivity despite the population's constant growth, which will increase from 147.6 million in 2010 to 164.7 million in 2020 (BBS, 2022), as a result of the pandemic and climate change. Bangladesh is a country that is vulnerable to various natural hazards, and the agriculture sector is no exception to the damages caused by these hazards. The primary natural hazards like floods, cyclones, salinity intrusion, cold waves, etc. cause losses in crop production, livestock farming, fisheries, and forestry, affecting the country's food security and economy. The high propensity for natural disasters such as floods, droughts, torrential rains, and cyclones pushes the agricultural sector of this country into a vulnerable position. Bangladesh is the most vulnerable country to climate change, which causes river erosion, floods, flash floods, and the intrusion of salinity into the land. Thus, climate change is a major reason for the decline in agricultural production, which has made the country one of the

poorest and most flood-stricken developing countries in the world (Akter *et al*., 2008).

Moreover, agriculture has always been exposed to a variety of risks and uncertainties that are quite concerning for producers and, ultimately, consumers. Farmers are subject to a number of risks, including production risk, yield risk, market risk, pricing risk, institutional risk, financial risk, credit risk, and personal risk. The main risk for rural farmers in this country is crop failure due to unexpected variations in weather conditions (Rahman *et al*., 2014). Agricultural risk poses a significant danger to the income and overall price stability of such nations because it is the backbone of the majority of emerging economies worldwide. Inefficient agricultural policies in post-disaster situations that occur every year discourage farmers from continuing their businesses and migrating to other non-farm activities or even migration to other places, which ultimately will pose a threat to the country's food security (Islam *et al*., 2021). Crop insurance is particularly important as a risk management strategy, according to Colovic and Mrvic-Petrovic (2014), because of a variety of hazards and their effects. The use of insurance as a risk management tool in agriculture is particularly important to protect against farm income losses caused by unfavorable weather and other uncontrollable events. Moreover, the adoption of one risk management tool would encourage farmers to use another risk management tool simultaneously (Adnan *et al*., 2018).

Traditionally, farmers have managed risks by using less risky technologies for lower but reliably yielding drought-resistant crops; by seeking diversification both in terms of production activities and on-farm and off-farm income-generating activities; and by devising informal and formal risk sharing arrangements (Friedberg, 2003). Farmers and ranchers can use crop insurance as a crucial risk management tool to help safeguard them against drops in crop production and income. Crop insurance is a type of insurance policy that is designed to protect farmers and other agricultural producers from financial losses due to crop failures or other natural disasters that can negatively impact their crops. Crop insurance policies typically provide coverage for losses resulting from a wide range of perils, including drought, flood, hail, wind, insects, and disease. Depending on the policy, farmers may be able to receive payments for lost yields, lost revenue, or both. Crop insurance is often subsidized by the government to make it more affordable for farmers. In France and Italy, the insurance system is heavily subsidized, shifting from public funds to private plans. They reported that insurance coverage has developed into more cost and less profit and indicated that farmers' attitudes will be more secured by overcoming the high costs (Enjolras *et al*., 2012). The government-owned insurance business Sadharan Bima Corporation (SBC) first offered agricultural crop insurance in Bangladesh as a pilot program in 1977. SBC offered individual-grower multiple-peril crop insurance (MPCI) products. Then, in 1981, SBC created animal fatality insurance, and in the middle of the 1990s, it offered aquaculture insurance. However, on account of poor underwriting results and a lack of demand, SBC had terminated these programs by the turn of the century. Prior to 2014, there was no history of the private sector offering commercial agriculture insurance. Beginning in 1977, SBC introduced a traditional individual-grower multiple-peril crop insurance (MPCI) yield-shortfall policy that offered protection against a variety of climatic perils, including the biological perils of pests and diseases as well as the potentially catastrophic climatic perils of floods, droughts, and winds. Rice (Aman, Boro, and Aus), wheat, sugar cane, and jute were among the insured crops. From 1977 to 1995, SBC was the sole insurer for the individual grower MPCI program. SBC accepted all losses without the benefit of any external reinsurance protection, and the government provided no premium subsidies or any financial assistance.

Crop insurance is still a relatively new concept in Bangladesh, but efforts are being made to develop and expand crop insurance programs in the country. Currently, the government of Bangladesh provides crop insurance coverage through the Agricultural Insurance Company Limited (AICL). The AICL offers insurance coverage for a variety of crops, including rice, wheat, maize, jute, sugarcane, and vegetables. The AICL's crop insurance policies cover losses due to natural disasters such as floods, droughts, and cyclones, as well as losses due to pest and disease outbreaks. The policies provide coverage for the cost of inputs (such as seeds and fertilizers), the cost of labour, and the cost of land preparation. However, the coverage provided by the AICL is limited, and many farmers in Bangladesh do not have access to crop insurance. This is partly due to the high cost of premiums, which can be prohibitively expensive for small-scale farmers. To address this issue, the government of Bangladesh is working to develop a more affordable crop insurance program that will be accessible to all farmers, regardless of their scale of operation. The government is also exploring the possibility of partnering with private insurers to expand the availability of crop insurance and make it more affordable for farmers. One of the most important initiatives in this regard is the Crop Insurance Program for Small and Marginal Farmers (CIPSMF), which was launched in 2013. This program provides subsidized crop insurance coverage to small and marginal farmers, who often have limited resources to cope with crop failures. Under the CIPSMF program, farmers can receive up to an 80% subsidy on the insurance premium, depending on the crop and the area under cultivation. The program covers a wide range of crops, including paddy, wheat, maize, pulses, oilseeds, and vegetables, among others. In addition to the CIPSMF, the government of Bangladesh has also launched other programs to promote crop insurance, such as the National Agriculture Insurance Program (NAIP) and the Weather Index-Based Crop Insurance (WIBCI) program. These programs are aimed at increasing awareness and uptake of crop insurance among farmers.

For rice farmers in three regions of Bangladesh, including the prone-to-drought Rajshahi, the ADB has conducted a pilot program for weather index-based crop insurance. The pilots feature three innovative components. Parametric weather indices use climate information generated by the Bangladesh Meteorological Department. These indices determine the payout trigger points, such as when precipitation rises above or declines below

predetermined amounts. Automatic Weather Stations (AWS) help activate timely claim settlements after the occurrence of a disaster. The Sadharan Bima Corporation insured around 9,500 small farmers. Mobile banking services' tie-up with bKash enabled efficient and transparent collection of insurance premiums and payment of claims. The premium contribution was shared in the ratio of 50:25:25 among the farmers, the government, and the project financier (The Financial Express, 2023).

It's important for the government and the insurance providers to know the actual factors that are driving the farmers' decisions to pay for the premium amount and in what range they are affecting it so that they can provide farmer-friendly premium offers to make it work for a greater impact. This study is a small attempt to help policymakers find out some more accurate and effective offers for the farmers so that they can adopt crop insurances spontaneously and make a good comeback after being cuffed by natural or even man-made disasters. The knowledge gathered from this study on farmers' influential factors for WTP of crop insurance may help government extension workers expand their awareness program in more vulnerable areas in a more organized manner. The main objectives of the study are as follows: (i) to analyze the socioeconomic characteristics of the sample farmers; (ii) to determine the profitability of selected crops; (iii) to estimate the premium amount that sample farmers are willing to pay; and (iv) to assess the factors that influence the farmers' decision on premium payment.

MATERIALS AND METHODS

A sample of 107 farmers was selected randomly from Kishoreganj Sadar, Karimganj, and Tarail upazilas under Kishoreganj district. The data were collected from January to March 2023 using a semi-structured interview schedule. Focus group discussions (FGDs) and observation techniques were also used to get relevant information.

To determine the profitability of different crop productions (rice, jute, wheat, and vegetables: potatoes and tomatoes), the current investigation employed the following equation:

$$\pi = P_y Y - \sum_{i=1}^{n} (P_{xi} X) - TFC$$

π = net return (Tk./ha);
Py= per unit price of the product (Tk./Kg)
Y= quantity of the production per hectare (Kg)
Pxi= per unit price of ith inputs (Tk.)
Xi = quantity of the ith inputs per hectare (Kg)
TFC= total fixed cost (Tk.);
i=1,2,3……,n (number of inputs).

For determining the correlation between WTP and the other factors, we take WTP as the dependent variable. As the WTP data was taken in two ways (amount of premium per decimal and amount of premium as a percentage of the compensation amount), we determined the correlation twice, taking each type of WTP.

A statistical measure known as correlation shows both the strength and the direction of a relationship between two variables. It is a measure of the degree to which two variables are linearly related to each other. Correlation is typically expressed as a correlation coefficient, which can range from -1 to +1. A correlation coefficient of +1 indicates a perfect positive correlation, which means that as one variable increases, the other variable also increases. A perfect negative correlation, or correlation coefficient of 1, means that when one variable rises, the other variable falls. A correlation coefficient of 0 indicates no correlation between the two variables.

To what extent the variables are correlated can be determined. For this, we use Karl-Pearson analysis. The covariance of the two variables is divided by the sum of their standard deviations to obtain the Pearson correlation coefficient. The resulting value can range from -1 to +1, with a value of 0 indicating no correlation, a value of +1 indicating a perfect positive correlation, and a value of -1 indicating a perfect negative correlation. It is particularly useful when researchers want to know whether there is a statistically significant relationship between two variables and how strong that relationship is. However, it is important to note that the Pearson correlation coefficient only measures linear relationships and may not capture more complex relationships.

This method is also known as the Product Moment Correlation Coefficient and was developed by Karl Pearson. It is one of the three most potent and extensively used methods to measure the level of correlation, besides the scatter diagram and Spearman's rank correlation. The Karl Pearson correlation coefficient method is quantitative and offers a numerical value to establish the intensity of the linear relationship between X and Y. Such a coefficient of correlation is represented as r. The following is the formula for the Karl Pearson coefficient of correlation.

$$: r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2}}$$

In this formula,

$$x = X - \bar{X}$$

$$y = Y - \bar{Y}$$

Where,
$\bar{X}$ = Mean of x variables
$\bar{Y}$ = Mean of y variables.

The Karl Pearson coefficient can be obtained using various methods, which are mentioned below:

$$r = \frac{\sum(X - \bar{X})(Y - \bar{Y})}{\sqrt{\sum(X - \bar{X})^2}\sqrt{(Y - \bar{Y})^2}}$$

Assumed Mean Method Which is expressed as:

$$dx = X - A$$

$$dy = Y - A$$

$$r = \frac{N\sum dx\,dy - (\sum dx)(\sum dy)}{\sqrt{N\sum dx^2 - (\sum dx)^2} - \sqrt{N\sum dy^2 - (\sum dy)^2}}$$

In this Karl Pearson Correlation formula,
dx = x-series' deviation from assumed mean, wherein (X - A)
dy = Y-series' deviation from assumed mean = (Y - A)
Σdx.dy implies summation of multiple dx and dy
Σdx^2 is the summation of the square of dx
Σdy^2 is the summation of the square of dy.
Σdx is the summation of X-series' deviation
Σdy is a summation of the Y-series
N is the number of observations.
Step Deviation Method which is expressed as:

$$r = \frac{dX'dY' - \frac{\sum dX'\sum dY'}{N}}{\sqrt{\sum dX'^2 - \frac{(\sum dX')^2}{N}.\sum dY'^2 - \frac{(\sum dY')^2}{N}}}$$

In this particular Karl Pearson Method,
dx′= dxC1dx′= dxC1
dy′= dyC2dy′= dyC2
C1 = Common factor for series x
C2 = Common factor for series y
dx is x-series' deviation from the assumed mean, where (X - A)
dy is Y-series' deviation from the assumed mean, where (Y - A)
Σdx.dy implies summation of multiple dx and dy
Σdx^2 is the summation of the square of dx
Σdy^2 is the summation of the square of dy
Σdx is the summation of X-series' deviation
Σdy is the summation of the Y-series
N is the number of observations in pairs.

RESULTS AND DISCUSSION

Socioeconomic characteristics

The socioeconomic characteristics of the respondents help to improve their public presentation and encourage them to adopt practices for pointing out hazards. They help increase the entrepreneurial abilities of farmers in their decision-making processes for managing risk, especially those relating to the agricultural enterprise system (Sani and Haruna, 2010). Based on this rationale, the relevant socioeconomic characteristics of the respondents were investigated to determine how they affect the willingness of the farmers to participate in crop insurance programs to adapt to natural disasters. Table 1 shows the socioeconomic characteristics of the respondents.

Table 1. Respondents' socioeconomic characteristics.

Variables	Frequency	
	Range	Percentage
Age	18-25	5.6
	26-35	19.6
	36-45	28
	46-55	21.5
	56-65	13.3
	Above 65	12
Gender	Male	98.1
	Female	1.9
Education	Primary	62.6
	Secondary	32.3
	Higher Secondary	5.1
	Above	0
Occupation	Agriculture	75.7
	Business	16.8
	Other	7.5
Family Size	Small (1 to 4)	34.58
	Medium (5 to 6)	46.73
	Large (> 6)	18.69
Net Income	Deficit spending (More than Tk. 10000 ($93.46)	2.8
	Deficit spending (Tk. 2000-10000 ($18.69-$93.46)	5.6
	Saving (Tk. 2000-10000) ($18.69-$93.46)	18.7
	Saving (Tk.10000-20000) ($ 93.46-$186.92)	30.8
	Saving (Tk. 20000-50000) ($ 186.92-$ 467.29)	19.6
	Saving (Tk. 50000-100000) ($ 467.29- $ 934.58)	22.5
Cultivable Area	Less than 1 Hectare	72.9
	1-2 Hectare	26.2
	2-4 Hectare	0.9
Marital Status	Married	91.9
	Unmarried	6.2
	Widowed	1.9

Source: Field Survey, 2023 (US$ 1= Tk.107.00).

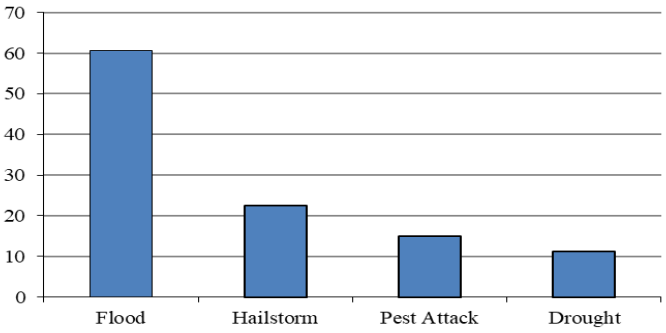

Figure 1. *Severity of risk faced by the farmers.*

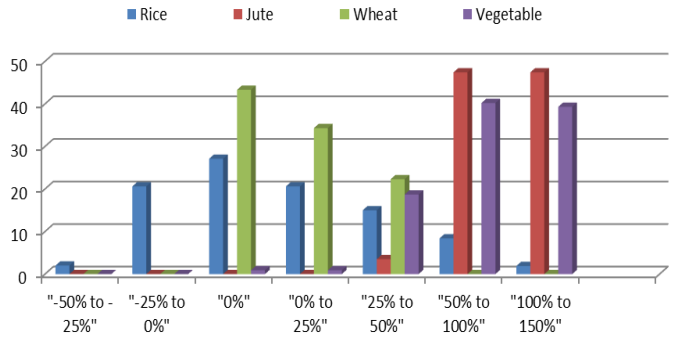

Figure 2. *Profitability of different crops.*

The majority of the respondents were middle-aged. The maximum of 28% was from 36 to 45 years old, whereas 21.5% were 46 to 55 years old. The youngest age range had the minimum percentage of 5.6%, which indicates younger people are not really involved in agriculture as their main business, but 19.6% of people aged 26–35 is engaged in agriculture.

For obvious reasons, the majority of the respondents were male (98.15%), whereas 91.9% of the respondents were married. Only 6 (5.6%) were unmarried, and 2 (1.9%) of them were widowed. The majority of respondents (62.6%) only had primary education, 32.3% had secondary education, and only 5.1% had studied until higher secondary. No one among the respondents had an education above high school. Uddin *et al.* (2018) found in Kishoreganj district that most of the respondents were illiterate (43.3%), whereas 35.9% completed primary education.

People who are directly or indirectly engaged in agriculture were primarily chosen for this study. Out of those participants, 75.7% have agriculture as their primary occupation, 16.8% have business, and 7.5% have others as their primary and agriculture as their secondary source of income. Uddin *et al.* (2018) found that, in terms of occupation, 65.2% and 34.8% of respondents were involved with agriculture only and agriculture and other income-generating activities, respectively, in Kishoreganj district. Out of 107 participants, 34.58% were small families (1 to 4), the total number of family members was 143, 46.73% were medium families (5 to 6), the total number of family members was 273 and 18.69% were large families (> 6), the total number of family members was 134. The average family size was 5.14. Uddin *et al.* (2018) found that the average family size of the respondents was 6.0 in Kishoreganj district, which was higher than the national average of 4.1 (HIES, 2016). The majority of farmers among the respondents (72.9%) were marginal farmers with less than 1 hectare of land. 26.2% had 1-2 hectares of land. Only 1 farmer (0.9%) said he had more than 4 hectares of land.

The respondents were not very easygoing about sharing their income and expenditures with the interviewer, as they have a little timid psychology about exposing their personal affairs to strangers. After much persuasion, they consented to provide the interviewer with this information. The respondents were asked about their yearly income and expenditures separately. The author calculated the net income and then ranged it for convenience. 2.8% of the respondents had a deficit in yearly spending of more than Tk 10,000 ($93.46). A few (5.6%) had deficit spending of Tk. 2000–10000 ($18.69–$93.46). 18.7% could make a little saving of Tk. 2000–10,000 ($18.69–$93.46) a year. The majority (30.8%) had yearly savings around Tk. 10000–20000 ($93.46–$186.92). 19.6% of the participants could make a yearly saving of Tk. 20000–50000 ($ 186.92–$ 467.29). A good number of farmers (22.5) claimed that they make more than Tk 100,000 ($934.58) as their yearly savings. Farmers' incomes fluctuate primarily because of weather-induced risks, and small and marginal farmers, who have a poor resource base and who are dependent on natural resource endowments, are more vulnerable to such income shocks (Aditya *et al.*, 2020).

Risks faced by the farmers

According to the majority of respondents, floods were the worst natural disaster (60.7%), followed by hailstorms (22.5%), insect assaults (15%), and drought (11.2%), as shown in Figure 1.

Profitability of the cultivated crops

Different farmers had preferences for cultivating different crops. Again, different crops have different profitability. For calculative purposes, the author tried to range the profit margin and input the data in accordance with it. A cumulative representation of the data is presented in Figure 2 in a bar diagram. In the x axis, the profitability margins were shown, and in the y axis, the valid percentage of that range was shown. Different crops are shown in bar form in different colors. From the diagram, it is clear that rice is not proven to be a profitable crop, as it showed a higher percentage of lower profit margins. Even when the profit margin percentage increased, the bar consistently displayed a lower value. This means farmers are not getting a satisfactory level of profit from cultivating rice. Wheat can be claimed as an average profitable crop as it showed a higher bar at average profit margins (0%, 0%–25%, and 25%–50%). On the contrary, jute has proven to be a very profitable crop, as it showed over 45% of the valid percentage in the highest profit margins (50% to 100% and 100% to 150%). Vegetables have also shown an impressive performance (almost 40%) in acquiring profit at the highest margins (50%–100% and 100%–150%). According to Kim *et al.* (2019), farms that take crop insurance have a 70% lower chance of closing down and live an average of 7 years longer than farms that do not. These results show that crop insurance reduces farm survival and business risk, mostly through increasing liquidity.

Willingness to Pay (WTP) for crop insurance

To have a more accurate result, the author tried to gather information on the WTP of the farmers in two ways. One is the amount that the farmer wants to pay per decimal of the land that he owns or works on. Another one is the percentage of the compensation amount that the farmer wants to pay as the premium amount that he is going to get paid. For different crops, the farmers were asked to calculate the amount of premium per decimal separately, which is WTP. The options given to them were: not interested; Tk. 10–15 ($0.09–$0.14); Tk. 16–20 ($0.15–$0.19); Tk. 21–25 ($0.20-$0.23); and Tk. 26–30 ($0.24–$0.28). A study in Malaysia uncovered the fact that farmers are willing to participate in crop insurance schemes at affordable rates (Abdullah *et al*., 2014).

In Ghana, the land tenure system practiced by the farmer, educational level, and age of the farmer are the significant determinants of farmers' willingness to adopt crop insurance (Aidoo *et al*., 2014). Similarly, age, household size, and cropped area significantly and positively influenced whether premium cocoa farmers were willing to pay, while marital status and cocoa income negatively influenced whether premium cocoa farmers were willing to pay (Okoffo *et al*., 2016). Farmers with higher income levels have a greater tendency to insure their crops. Whereas older farmers were found to be exceptionally willing to be insured, farming experience was not found to affect the demand for insurance (Sargazi *et al*., 2013). Boyd *et al*. (2011) demonstrated that a number of factors account for Chinese farmers' decisions to obtain crop insurance. They used eight factors, including knowledge of crop insurance, prior crop insurance purchases, trust in the crop insurance provider, amount of risk taken on by the farmer, importance of low crop insurance premiums, government as the primary source of crop insurance information, role of village chief, and number of family members working in the city, to explain crop insurance purchase decisions. They discovered that all variables are statistically significant, with the exception of the variable representing the government as the primary information source for crop insurance. Khan and Hasan (2022) found that variables including education, opportunity for extension education, awareness of crop insurance, perception of risk, risk experience, and monthly income positively influence farmers' adoption of crop insurance. Whereas, variables such as farming experience, cooperative farming, and the application of alternative risk management strategies have a negative influence.

Amount of premium (percentage of the compensation amount)

For different crops, respondents were asked about the amount of premium they were willing to pay as a percentage of the compensation amount separately. The options given to them were: not interested, 2%, 5%, 8%, and 10%.

Correlation between WTP and Age

Age is negatively correlated in terms of the WTP of rice, whereas in the case of jute, wheat, and vegetables, it is positively correlated. The strongest positive relationship with the WTP seems to be with wheat (.577) (Table 2).

Correlation between WTP and Education

There is a positive correlation between education and WTP for different crops. WTP for wheat has the strongest correlation (.563), and WTP for jute showed the weakest correlation (.06) with education (Table 2).

Correlation between WTP and Occupation

As we see, WTP for jute is negatively correlated. WTP for other crops has a positive correlation with the occupation of the farmers (Table 2).

Correlation between WTP and Net Income

As the table shows, net income is positively correlated with WTP for all crops. The highest correlation (.923) is with the WTP for wheat. The Pearson Correlation Coefficient is highly significant for rice, wheat, and vegetables, as its p-value are the lowest (.000) Table 2.

Correlation between WTP and cultivable area

WTP for rice, wheat, and vegetables is positively correlated with the cultivable area of the farmers, whereas WTP for jute is negatively correlated with the cultivable area. The strongest correlation is between cultivable area and WTP for wheat (.867), and the weakest one is with WTP for rice (.312) (Table 2).

The correlation between WTP and the profitability of crops

The relationship between WTP and profitability for rice is positive and ranges from 0.230 to 0.213 (Table 3). Jute profitability and WTP for jute have positive correlations of 0.395 and 0.453, respectively (Table 3). WTP and wheat profitability have a high positive link ($r = 0.711$ for premium amount per decimal and $r = 0.745$ for premium amount in percentage of compensation amount, respectively) (Table 3). WTP is positively connected with vegetable profitability, which ranges from 0.212 to 0.338 (Table 3).

Conclusion

The study discovered that the respondents' WTP was not positively linked with variables like age and family size. The other variables and the WTP for rice have a positive correlation. Once more, there is a bad correlation between the WTP for jute and the cultivable area. The other variables and the WTP for jute were positively correlated. This indicates that the WTP for

Table 2. Correlation of Willingness to Pay (WTP) of different crops and age, education, occupation, net income and cultivable area of the respondents.

		Age, Education, Occupation, Net income and Cultivable Area	Premium amount per decimal for rice	Premium amount per decimal for jute	Premium amount per decimal for wheat	Premium amount per decimal for vegetables
Age	Pearson Correlation	1	-.117	.540**	.577	.289**
	Sig. (2-tailed)		.246	.000	.103	.003
	N	107	100	57	9	107
Education	Pearson Correlation	1	.353**	.060	.563	.184
	Sig. (2-tailed)		.000	.656	.115	.058
	N	107	100	57	9	107
Occupation	Pearson Correlation	1	.033	-.225	.750*	.038
	Sig. (2-tailed)		.745	.092	.020	.697
	N	107	100	57	9	107
Net Income	Pearson Correlation	1	.492**	.076	.923**	.440**
	Sig. (2-tailed)		.000	.575	.000	.000
	N	107	100	57	9	107
Cultivable Area	Pearson Correlation	1	.312**	-.128	.867**	.071
	Sig. (2-tailed)		.002	.341	.002	.466
	N	107	100	57	9	107

*At a 2-tailed significance threshold of 0.05, correlation is significant; ** The significance level for correlation is 0.01 (2-tailed).

Table 3. Correlation of WTP for rice, jute, wheat and vegetables and the profitability of rice, jute, wheat and vegetables

		Profitability of rice, jute, wheat and vegetables	Premium amount per decimal for rice, jute, wheat and vegetables	Premium amount in percentage of the compensation amount for rice, jute, wheat and vegetables
Profitability of Rice	Pearson Correlation	1	.230*	.213*
	Sig. (2-tailed)		.021	.033
	N	102	100	100
Profitability of Jute	Pearson Correlation	1	.395**	.453**
	Sig. (2-tailed)		.002	.000
	N	57	57	57
Profitability Wheat	Pearson Correlation	1	.711*	.745*
	Sig. (2-tailed)		.032	.021
	N	9	9	9
Profitability of Vegetables	Pearson Correlation	1	.338**	.212*
	Sig. (2-tailed)		.000	.028
	N	107	107	107

**Correlation is significant at the 0.01 level (2-tailed); *Correlation is significant at the 0.05 level (2-tailed).

both wheat and vegetables is positively correlated with variables such as age, gender, education, marital status, occupation, family size, net income, and cultivable area. Most notably, the data show that a crop's profitability has a significant impact on the choice of WTP for that crop. The study's conclusions may be used to help insurance companies and legislators create insurance plans that are beneficial to farmers. It was disconcerting to witness how clueless people were regarding the insurance issue. The farmers must be educated about insurance and its advantages through necessary and expeditious action. People sometimes exhibited little interest or even no interest in paying the premium because they believed it would be a waste of money if no natural disaster or other unpredictable event reduced the number of crops they could harvest. Since most farmers lack education, they steer clear of official financial organizations since they are unable to understand their procedures and other criteria. Policymakers may focus on developing some enticing plans to entice farmers to purchase crop insurance. In order to deploy various types of crop insurance, such as index-based crop insurance, across the country, the government needs to develop a variety of sophisticated technologies and the infrastructure to support them.

Conflict of interest

No conflicts of interest exist, according to the authors, with the publishing of this paper.

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