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# FUZZY-LIKERT SCALE BASED ASSESSMENT OF MARKETING RISK FACED BY THE HYBRID RICE GROWERS OF BANGLADESH

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## ABSTRACT

The primary concentration of this study was to assess the marketing risks faced by hybrid rice growers and explore the trajectories. With this notion, data were collected from randomly selected 300 hybrid rice growers in purposively chosen areas with the application of a structured interview schedule and conducting five focus group discussions with the farmers. The study identified seven key risks responsible for the poor marketing of hybrid rice in Bangladesh. Perceived marketing risks were assessed by farmer's opinion on likelihood and severity of each risk source through using a fuzzy-Likert scale. According to the finding 'high fluctuation of hybrid rice price' was the most serious risk in hybrid rice marketing in Bangladesh. The regression result found several socio-demographic factors of the farmers are significantly related with perceived risk. This study, therefore, suggests government taking propolicies for hybrid rice growers organized around farmers' those socio-demographic characteristics for minimizing marketing risk.

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## Introduction

Bangladesh is one of the peak densely inhabited nations in the world, where around 1,237.51 people reside per square kilometer (EC, 2015). Despite very low per capita land holding (approximately 0.048 hectares, WB, 2015), the cultivable land is declining at 1 per cent per year. FAO (1993) estimated, about 0.07 hectares of arable land per person is required for a year-round vegetarian diet and excluding various land degradations, with sufficient availability of water. Therefore, it is challenging to meet future food security needs. Also, the high population growth rate makes the country vulnerable to future food security. It is assumed in 2050, the population of the country will be 1.5 times than the present population (UN, 2010). Currently, 35% of the people are living under the food consumption poverty line (Kashem & Faroque, 2011). Bangladesh is the fifth most vulnerable nation to climate change (the Daily Star, 2011) and affecting the crop production in Bangladesh. Usually, a disastrous cyclone attacks the country once every three years (GoB, 2008). Bangladesh has been experiencing around 6-20 mm sea level rise in every year (Siddique, 2015) and around 40% of productive land in the southern region will be lost in a 65 cm sea level rise by the 2080s (WB, 2013).

To face the present challenges, the country has initiated some horizontal and vertical programs for increasing food crop production, e.g., mixed farming, relay cropping, multi-storied cropping together with high yielding hybrid varieties. Hybrid rice production was initiated in Bangladesh in 1998 to increase the total rice production due to excessive demand for rice for a growing population to meet the food security. As, rice is the staple food, supplying 76% calorie intake 66 % protein (Bhuiyan et al., 2002) and 43.6% of labor force (BBS, 2010, HIES, 2009), 9.5% GDP (Alam & Islam, 2013). Initially, yield advantages of hybrid rice motivated many farmers to adopt it, but very soon the number of hybrid rice farmers and area dropped dramatically. After the introduction of hybrid rice in 1998-99, the area within nine years increased around 4263% (Rashid et al., 2011): then suddenly, popularity declined. In 2007-08 the hybrid rice area was 0.80 million hectare whereas in 2013-14 it dropped to 0.63 million hectares (Parvez, 2014) which is only around 7.05% of the total area (Krishi Dairy, 2018). Researchers have identified various risks were inhibiting the adoption of hybrid rice production in Bangladesh (McFall et al., 2013; Shah et al., 2015; Pervez, 2018). Among the risks, the marketing risks are the most significant. Due to these, many farmers are losing their significant profits and even, sometimes, their investments. Numerous intermediaries are dominating the hybrid rice market. Therefore, farmers are not getting a fair price for their produce: instead, the intermediaries are getting the lion share of benefit (Shaikh, 2008). Furthermore, market instability and failure are widespread in the case of hybrid rice. Therefore, the current study was intended to: (i) discover marketing risks in hybrid rice production in Bangladesh; (ii) score the Perceived Marketing Risk (PMR) and rank; and (iii) find out the relationship between socio-demographic characteristics and PMR.

## The market-related risk in agriculture in Bangladesh

There are five separate risk factors in the field of agriculture: (i) production or yield risk; (ii) marketing risk; (iii) credit risk; (iv) personal risk; and (v) financial risk (Pervez et al., 2016). In Bangladesh, the main risks in agriculture come from price or market-related activities. The gap between the selling price from farmers and the consumers' purchasing price is exceptionally high (Abdullah & Hossain, 2013) because of the presence of intermediaries in the market. Due to lack of storage facilities and extreme poverty, peasants are bound to sell their products immediately after the harvest. Therefore, in a particular season, a specific crop floods the markets, and ultimately the price diminishes and sometimes goes below the cost of production.

On the other hand, farmers in Bangladesh generally invest in by receiving loans from *mohajons* (rural loan broker) (Pervez et al., 2016). *Mohajons* usually claim a very high interest, sometimes 1.5 or 2 times higher than the loan amount after a crop season (90-120 days); their business is locally called *dera shud* (150% interest) and *duna shud* (double repayment) (Islam et al., 2012). Sometimes farmers go to NGOs for a loan, but NGOs still need formal procedures: for example, membership of the respective NGO, pay dues and start to deposit money. Therefore, poor farmers hardly find the benefits from microcredit for crop production (Khatun et al., 2013).

Furthermore, the marketing structure and the transport facilities for farmers are also fragile, and the peasants have minimum access to the urban market. This plight creates space for the middlemen (Chowdhury, 2011; Khan, 2012). Due to the excessive presence of intermediaries in the market farmers cannot directly sell their commodities to ultimate consumers (Matin et al., 2008). Therefore, farmers go to *arotder* (rural wholesaler) to sell their product. *Arotder* also offers a little price to the farmers (Pervez et al., 2016).

Other marketing risks come from the political turmoil of the country. A general strike ('*hartal*') creates an obstacle to selling farmers' products in the market, due to violence in the streets and blockages of the road, but people in the cities are forced to spend a higher amount of money because of limited supply. Therefore, the profit again goes to middlemen mostly, and farmers lose out.

## Materials and methods

Hybrid rice production in Bangladesh is geographically localized. Even in a single district, all sub-districts (Upazilla) have not entered into the hybrid rice cultivation program. Therefore, the study was conducted in purposively selected two different Upazillas namely; Khoksa and Debidwar from Kustia and Comilla districts in Bangladesh, respectively. The significant reason behind purposive selection is the number of farmers and the areas under hybrid rice cultivation in the areas has been declining with time. The familiarity of the researchers with the study areas and extension agents is also one of the reasons. A total of 1500 farmers (households) were (2014-2015) cultivating hybrid rice which was considered as the population of the study. The

list of farmers was collected from the two Upazilla agriculture offices. From the list of farmers, we used a random sampling (using the table of random numbers) of 20% of the population: therefore, the sample size of the study is 300.

The marketing risk sources (seven risks) were identified by conducting five Focus Group Discussions (FGDs) with hybrid rice farmers. Data were collected from the hybrid rice farmers by carrying out structured personal interviews, from January, 2015 to June, 2015. To assess the reliability and consistency of the instrument, Cronbach alpha was calculated from the pre-test results of the seven items. The reliability of statements showed an alpha value of more than 0.70, the accepted value (Nunnally, 1978).

Farmers' socio-demographic characteristics, e.g. age, education, annual family income, family farm size, watching /listening to agriculture-related programs on TV/radio, source of hybrid rice seeds, rice selling in the Public Procurement (PP) and loan from NGO/NGOs were taken as the independent variables of the study (Table 3). The dependent variable of the study was Perceived Marketing Risk (PMR) in hybrid rice production.

### **Measurement of PMR using Fuzzy-Likert Scale**

The relationship among risk (R), hazard (H) and vulnerability (V) can be expressed in a mathematical equation presented by Soussan & Arriens (2004) and Kirilenko et al., (2004).

$$R = f(H \times V) \quad (1)$$

Similarly, German sociologist Ortwin Renn defined 'risk' (Renn, 2008) as the multiplication of the probability of an event occurrence and its significance level of potentially unfavorable condition. Therefore the term 'risk' can be described mathematically as:

$$\text{Risk} = \text{Probability of an event} \times \text{Significance (loss due to the event)} \quad (2)$$

To measure PMR, we used a fuzzy-Likert scale instead of the traditional Likert scale. Although the Likert scale is the most commonly used psychometric scale in the arena of survey research, we used a modified Likert scale to avoid the limitations of the traditional Likert scale. Generally, attitudes towards a statement are vast and have a multi-dimensional continuum. The Likert scale is a single-dimensional and gives only 5 to 10 different options of choice to the respondents. Thus, it is challenging to measure the real attitude of participants. Likert scale assumes equal differences between two consecutive scale points (e.g., strongly agree=5, agree=4). Social scientists like Cohen et al., (2000) have argued that this is illegitimate: to assume the same difference between two consecutive scale points.

Another significant constraint of the Likert scale is that it is based on a closed format for the responses (Hodge & Giliepie, 2003). Therefore Li (2013) argued that the scale forced the respondents to choose only from given options, whether or not they represented the respondent's true opinions. To overcome the limitation of existing Likert scale, Li

(2013) suggested a Likert scale based on fuzzy sets. The fuzzy set concept was first introduced by L.A. Zadeh (Zadeh, 1965). Although uses of fuzzy sets in engineering and mathematics have been widely successful, their use in social sciences has been quite limited. These sets have essential applications in the field of social sciences (Ragin, 2000; Smithson & Verkuilen, 2006; Rivza & Rivza, 2013; Uddin, 2012). As, a fuzzy risk matrix is a potent tool for semi-quantitative risk assessment, as proved by Markowski & Mannan (2008), to handle different process activities of hazardous events (Portik & Pokoradi, 2014).

From the definition of the risks (equation 2) we know, risks have two different sides: an uncertainty which can be measured with ‘probability’ or ‘likelihood’ and the ‘impact’ or ‘consequences’. Therefore, for obtaining better results, we applied a two-dimensional scale in our research. Five points fuzzy–Likert scale for probability measurements (Table 1) and another five point’s fuzzy–Likert scale for impact assessment (Table 2) were used (Rivza & Rivza, 2013; Pervez, 2018). Previously, in some studies, farmers were asked to rate the risk level. However, Botterill & Mazur (2004) argued that risks should be identified by its’ probability and consequences.

**Table 1:** A triangular fuzzy scale for evaluation risk probability

Linguistic scale	Characterization	Triangular fuzzy scale
Unlikely	Could happen only under rare conditions	(0, 0.125, 0.25)
Seldom	Could happen though unlikely (once in few years)	(0.15, 0.30, 0.45)
Occasional	Could happen once in a year	(0.35, 0.50, 0.65)
Likely	Could happen once in every season	(0.55, 0.70, 0.85)
Frequent	Could happens two or more time in every seasons	(0.75, 0.875, 1.0)

Source: Rivza and Rivza (2013), Modified; Pervez (2018)

**Table 2:** A triangular fuzzy scale for evaluation of the significance (impact) of risks

Linguistic scale	Characterization	Triangular fuzzy scale
Negligible	Up to 1% from the total budget	(0, 0.0075, 0.015)
Minor	1-5% from the total budget	(0.005, 0.025, 0.055)
Moderate	5-10% from the total budget	(0.045, 0.0775, 0.11)
Critical	10-25% from the total budget	(0.09, 0.195, 0.30)
Catastrophic	Above 25% from the total budget	(0.20, 0.60, 1.0)

Source: Rivza & Rivza, (2013), Modified; Pervez (2018)

Fuzzy values for probability and consequences were multiplied according to fuzzy multiplication law ( $A \otimes B = (a_1 \otimes b_1, a_2 \otimes b_2, a_3 \otimes b_3)$ ) (Habibi et al., 2015). Thereby, we obtained new fuzzy values: but these values are not real numbers. So, we need defuzzification of the triangular fuzzy values. Among the different defuzzification methods, we used centroid methods (Ross, 2005). The defuzzification value for each item was used as the PMR score for that item (Yu & Lee, 2012; Kadir et al., 2013).

Finally, all scores for each risk source were summed to get the total PMR score of an individual farmer. The defuzzification value and the frequency distribution of the farmers' level survey on PMR sources are shown in appendix A.

### **Results and Discussions**

The results of the descriptive analysis are summarized in table 3. According to the findings, the majority of the respondents were young to middle-aged. Older people in Bangladesh generally are not interested in taking new knowledge as an innovation (Feder et al., 1985). Quddus (2012) also found that the probability of farmer's adoption of new technologies decreased with their age in Bangladesh.

Among 300 hybrid rice farmers, only 31 were women. Although women in Bangladesh are primarily responsible for food production, the land is generally possessed or controlled by the men, and therefore women's productivity is often constrained (Sarwar, 2007). Women are also burdened with domestic duties which limit their time and energy to spend on agriculture. Furthermore, they are generally unable to take the risk of high expenditure. Rural women prefer cultivating by using indigenous knowledge for a long time because of less empowerment, less education and low-level technological know-how (Pervez et al., 2015).

Most of the hybrid rice farmers had finished only secondary education. Very few hybrid rice farmers have completed their bachelor's degree. This is because educated people in the country are not interested in taking farming as a profession.

Annual family income of the hybrid farmers is mostly medium. Farmers with low-income levels are unable to take risks. On the other hand, rural people with higher income are not interested in conducting direct farming. They provide leasing their land to the landless and marginal farmers, which is entirely risk-free farming. The rich generally make unfair agreements with the peasants (Pervez et al., 2016) and risks usually go to the peasants.

Hybrid rice farmers were classified by their family farm size, as guided by BBS (1993). Most of the farmers were under 'marginal,' 'small' and 'medium' farmer's categories: only two farmers were 'large', and there are no hybrid rice farmers under 'landless' category. Landless and marginal farmers cannot allocate their land for the hybrid rice farming because of land shortage and inability to take the risk.

Most of the farmers do not watch/ listen to the agricultural programs on TV/radio. Farmers usually cannot allocate the time for watching/ listening to this kind of applications (Pervez, 2018): some cannot adjust to the specific time of these programs, as farming is not conducted on a timetable. Others are not interested in these programs: they prefer to enjoy drama or listening to music.

Only around one-fourth of the farmer gets their hybrid rice seed from the government sources. Low infrastructure and the inability of the government to produce a large-scale hybrid rice seed bound farmers to go for expensive seed sources.

Furthermore, only a few farmers get opportunities to sell rice in public procurement (PP). Therefore, most of the hybrid rice farmers do not get a fair price for their product. Extreme corruption in PP prevents farmers to sell there as they do not have the money to bribe the officials to accept their rice (Pervez, 2018). Rice marketing channels are dominated by the middlemen in Bangladesh (Sultana, 2012). Therefore, farmers get lower prices, but in the polished rice market, the cost of rice is very high. Thus, most of the profits go to intermediaries (Pervez et al., 2017).

Around 70% of the farmers could not obtain a bank loan for farming. Generally, farmers have little access to the bank. Therefore most of the farmers go to NGOs for a credit, which is expensive because of very high-interest rates. Many researchers have argued that NGO services are not reaching the extremely poor (Khatun et al., 2013).

**Table 3:** Socio-demographic characteristics of hybrid rice farmers

Variable and scoring technique	Categories		SD	Mean	Mode
	n= 300	%			
Age (1 for each year)	Young (up to 34) - 55	18.33	11.50	45.41	55
	Middle aged (35-57)- 199	66.33			
	Old (more than 57)- 46	15.33			
Gender (0 for female 1 for male)	Male – 269	89.67	-	-	1
	Female- 31	10.33			
Education (1 for each year of schooling)	Low (up to 5) – 70	23.33	3.52	8.07	8
	Medium (6-12)- 215	71.67			
	High (more than 12)- 15	5.00			
Annual family Income ('0000 BDT)	Low (below 13.72) - 76	25.33	9.92	23.64	30
	Medium (13.72-33.56)- 186	62.00			
	High (above 33.56)- 61	20.33			
Farm Size (Hectare)	Landless (up to 0.02 ha)- 0	0.00	0.64	0.72	0.40
	Marginal (0.021 – 0.2 ha)- 35	11.67			
	Small (0.21-1 ha)- 204	68.00			
	Medium (1.1-3 ha) - 59	19.67			
	Large (above 3 ha)- 2	0.67			
Listening/watching agricultural program on radio/TV (0= Not listen/watch, 1= Watch/listen once in a month, 2= Once in a week, 3= More than once in a week )	Not listen/watch - 141	47.00	1.12	1.00	0
	Watch/listen once in a month- 66	22.00			
	Once in a week - 44	14.67			
	More than once in a week - 49	16.33			
Source of hybrid rice seed (0 for non-government, 1 for government source)	Non-governmental source – 215	71.67	-	-	0
	Governmental source - 85	28.33			
Rice selling in Public Procurement (PP)1, 0 for others )	Could not sell rice in PP- 205	68.33	-	-	0
	Could sell rice in PP - 95	31.67			
Bank loan (0 for no recipient, 1 for recipient)	Could not obtained bank loan - 212	70.67	-	-	0
	obtained bank loan-88	29.33			

By mean and the standard deviation, the farmers' PMR score was categorized into three (Table 4). The highest proportion of the farmers perceived under medium level risks (70%) whereas 17.33% and 12.67% of the respondents perceived the serious and little risks, respectively.

**Table 4:** Distribution of the respondents by marketing risk score

Categories	<i>f</i> ( <i>n</i> = 300)	%	<i>M</i>	<i>SD</i>
Low risky situation	38	12.67		
Medium risky situation	210	70	0.87	0.54
High risky situation	52	17.33		

The rank order of the risk sources is represented in table 5. Among the seven risk sources 'high price fluctuation of hybrid rice' obtained the highest score. The other catastrophic risk sources were 'refusal of hybrid rice cultivation due to high seed price', 'scarcity of hybrid rice seed during seasons', 'high economic losses due to the excessive presence of middlemen in hybrid rice marketing channel' ranked second, third, and fourth, respectively.

**Table 5:** PMR sources and their rank order according to survey data

Sl. No.	Sources of marketing risks	Score	Rank
1	The scarcity of quality hybrid rice seeds during seasons	35.3847	3
2	Refusal of hybrid rice cultivation by farmers due to high seed price	50.0727	2
3	High price fluctuation of hybrid rice price	57.0547	1
4	High economic loss to farmers due excessive presence of middlemen in the marketing channel	33.7987	4
5	Fertilizer and pesticides market instability	30.9982	5
6	Dissonance of farmers to cultivate hybrid rice due to high irrigation cost	28.0253	7
7	Poor demand of hybrid rice due to over-production of inbred rice	28.1888	6

Bangladeshi people are habituated to take flaky and non-sticky rice in their meals. Hybrid rice is stickier than the inbred rice because of low amylose content. Therefore market demand for hybrid rice in Bangladesh is deficient. On the other hand, the price goes high when there is an extreme crisis of inbred rice, thus low market signal to farmers to cultivate or not to cultivate. The high cost of hybrid rice seeds is another crucial problem in hybrid rice marketing in Bangladesh. Lack of government support to the farmers in seed production and poor government infrastructure create seed crises during the sowing time. Finally, the price increases sharply. Millers or intermediaries are very interested in buying these types of rice because of the low price. Millers purchase hybrid rice at a meager price and then mix it with other inbred rice. They then sell polished rice in the name of inbred rice. Thus, the profit gainers usually are millers or middlemen (Pervez et al., 2016).

The regression result (Table 6) shows that the relationship between the dependent and independent variables. Education has a significant negative association with PMR. Education can broaden the outlook and make one less fearful of risk. Educated farmers



can enter the market information via different media. Therefore, education helps to reduce the perception of risks in hybrid rice production. Nadhomi et al., (2013) found a similar relationship between schooling and perceived risk in soil erosion. The farmers with higher family incomes are capable of managing the risks because of their available resources. Thus, farmers with high family income perceive low marketing risks. Income generation reduces disaster risk perception (UN, 2009). The farmers who listen to/ watch agricultural programs/news on TV/radio can get the recent market information. Therefore, they faced fewer risks in the marketing of hybrid rice. Access to PP of hybrid rice provides a fair price for hybrid rice, which enables farmers to manage marketing risks. So, 'rice selling in PP' has a significant negative relation with PMR. Furthermore, the farmers who got the loan from the bank are capable of managing risks. Thus, this variable shows a significant negative association with marketing risks. In other studies, it has been detected that public investment in farming can reduce risks (Miller, 2008). The source of hybrid rice seed shows a significant positive relation which means the farmers who got the seed from government sources perceive that they are more vulnerable to risks. This is because, government sources provide their seeds without adequate support. On the other hand, private businesses are competitive. Some companies are providing technical assistance to increase yields, which can help to develop sales. Therefore, farmers who got seed from private companies felt they could manage risks better in comparison with the farmers who got seed from government sources.

**Table 6:** Regression results for PMR and socio-demographic characteristics of hybrid rice farmers

<i>Variables</i>	<i>B</i>	<i>SE</i>	<i>beta</i>	<i>t</i>	<i>Sig.</i>
(Constant)	1.646	.118		13.935	.000
Age	.001	.002	.012	.311	.756
Gender	.123	.068	.069	1.808	.072
Educational level	-.041	.008	-.264	-4.827	.000
Annual family income	-.019	.003	-.339	-6.792	.000
Farm size	.021	.034	.025	.621	.535
Watching/listening agricultural programs on TV/radio	-.094	.027	-.194	-3.419	.001
Source of hybrid rice seed	.191	.067	.158	2.859	.005
Rice selling in public procurement process	-.231	.064	-.198	-3.619	.000
Loan from bank	-.147	.067	-.123	-2.200	.029

## Conclusions

Although the Likert scale is the most commonly used scale in social sciences, scientists hardly criticized the shortcomings of the scale, particularly a problem where there are multidimensional continuums. The Likert scale uses close format for responses. Also, the scale applies a shaped edged difference between two scale-points which unable to explain semi-quantitative reactions. Therefore, for more precise and satisfactory assessment the research recommends fuzzy theory based Likert scale.

This study identified seven key marketing risks through discussion with hybrid rice farmers. These risks were ranked by likelihood and severity of an incidence by the farmer's assessment. By their assessment, we found that the main risk comes from the price volatility of hybrid rice. Other severe risks in hybrid rice production in Bangladesh are high seed price and the extreme scarcity of quality seed in the market during rice seasons. Thus most of the farmers discontinue hybrid rice cultivation or do not adopt hybrid rice cultivation as an innovation. This study also found that educated, income rich, large farmers who enjoy agricultural programs in mass media and sell hybrid rice in PP faced fewer risks compared to the others.

By findings, the current research recommends i) boosting farm educational program, arranging income maximization program, motivating big farmers to participate in hybrid rice cultivation. ii) Organizing low-interest crop loan program with the due interference of state extension can significantly reduce the marketing risk of hybrid rice growers of Bangladesh. iii) The Government should develop proper marketing channels with a fair price and should increase the production of hybrid rice seeds by farmers, along with technical support, to reduce the risks among the farmers. iv) The Government also should ensure proper extension and training supports along with adequate and quality seed marketing with a subsidy. v) Controlling the middlemen in the marketing channel in a proper way. vi) To increase facilities for hybrid rice research and development, the government should establishment a separate Hybrid Rice Research Institute in Bangladesh.

### **Conflict of interests**

The authors declare no conflict of interest.

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Appendix A: Frequency Distribution (n) of Farmers' Level Survey on Marketing Risk Factors

Linguistic scale	U	U	U	U	U	S	S	S	O	O	O	L	L	L	F	F	F	Total Score								
	N	M	Mo	C	Ca	N	M	Mo	C	Ca	N	M	Mo	C	Ca	N	M	Mo	C	Ca						
<b>Difuzzification value</b>	0.0019	0.0069	0.0138	0.0375	0.125	0.0034	0.0128	0.0281	0.074	0.24	0.0049	0.0188	0.0436	0.1133	0.36	.0064	0.0248	0.0591	0.1522	0.48	0.0075	0.0294	0.0719	0.1838	0.5750	
<b>Risk sources</b>																										
1. The scarcity of hybrid rice seeds during seasons	20	20	14	7	3	12	29	8	4	1	9	21	15	10	9	6	10	19	23	12	1	5	8	9	25	35.3847
2. Refusal of hybrid rice cultivation by farmers due to high seed price	12	2	1	2	1	4	2	4	8	0	3	6	9	10	6	2	8	31	47	8	4	7	34	56	33	50.0727
3. High price fluctuation of hybrid rice price	39	2	1	2	1	21	1	8	11	3	6	1	11	7	11	4	6	15	30	16	1	5	15	33	50	57.0547
4. High economic loss to farmers due excessive presence of middlemen in the marketing channel	6	2	4	3	5	2	13	3	8	1	5	17	51	29	6	1	6	31	48	7	1	0	13	30	8	33.7987
5. Fertilizer and pesticides market instability	4	1	5	2	4	13	14	5	5	1	10	22	23	4	0	10	16	38	18	4	0	14	34	35	18	30.9982
6. Dissonance of farmers to cultivate hybrid rice due to high irrigation cost	10	3	2	1	1	7	25	11	5	3	15	19	28	8	1	13	18	34	27	6	1	8	19	22	13	28.0253
7. Poor demand of hybrid rice due to over-production of inbred rice	12	8	7	4	2	12	22	8	3	5	9	17	28	9	3	16	10	30	21	5	14	8	15	15	17	28.1888

N.B. U= Unlikely, S= Seldom, O= Occasional, L= Likely, F= Frequent, N= Negligible, M= Moderate, Mo= Minor, Ca= Catastrophic