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Farmers Satisfaction towards Weather based Crop Insurance in Iran

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Abstract

Agricultural insurance is a supporting tool for financial resources of agricultural producers and investors. It is an effective tool for risk management in agriculture and its adoption by farmers as a new technology is dependent on many factors. In this study, the satisfaction of farmers who avail Weather based Crop Insurance in Iran were investigated. The study collected data through a structured questionnaire where 382 farmers were chosen as respondents who availed weather based crop insurance. The hypothesis was tested using one sample test which proved that awareness about weather based crop insurance has an influence on customer satisfaction. The study found that farmers were motivated to avail insurance as it provided adequate protection against risk. Also, they mentioned that the premium paid by them was high. Due to adverse weather incidences in Iran, weather based crop insurance is expected to provide adequate protection to the insured wheat cultivators in events of loss in crop yields.

Keywords: Farmers, Iran, Satisfaction and Weather based crop insurance.

Introduction

Agriculture has an important role as compared to other economic sector, in terms of assuring required food for growing population in the world. General view in agriculture is a lack of certainty (Ezat and Najafi, 2002) and agriculture production risks of crop failure or decreased yields are caused mainly by adverse weather events (drought, excess precipitation and floods), followed in small part by pests, diseases and fire. Few economic sectors are vulnerable to climatic (stochastic) variation (Dismukes and Glauber, 2000 and Glauber and Collins, 2004) and these concerns have spurred a large body of research on ex-post risk management practices in developing countries. Third world households have been shown to accumulate grain, livestock and financial assets as a form of precautionary saving. Gifts and mutual credit have also been identified as major conduits for the sharing of risk among members of the same community or with

distant relatives (Kurosaki and Fafchamps, 2002). Over time, several risk management tools were created by producers to manage these risks, including insurance schemes. Under some insurable conditions, the insurance allows an individual to turn a future and an uncertain expenditure (loss), which is usually high into an anticipated, certain and lower expenditure (premium) (Booth et al., 1999).

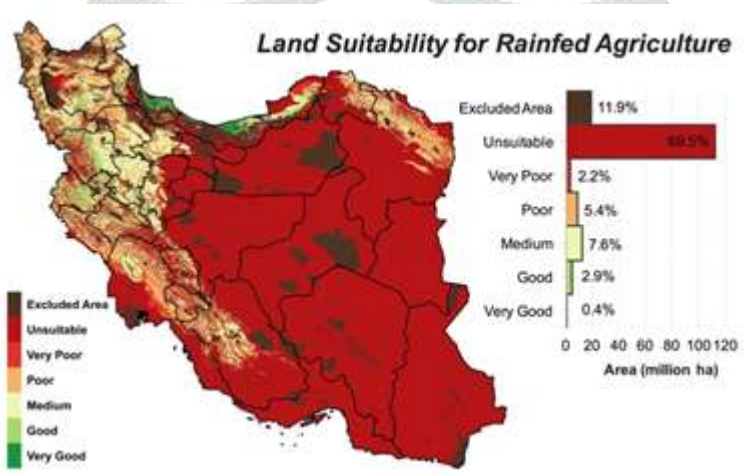
Crop insurance has been used in a variety of forms and purposes in more than 70 countries, according to an FAO survey published in 1991. In particular, developing countries have established crop insurance programs not only to provide farmers with another risk management tool, but also to promote other goals, such as improving farmers' access to credit, promoting production of high value crops that might also have higher yield risk and providing more stability to agriculture and related industries (Vandeveer, 2001). However, due to the increased complexity and variation in agriculture risk, farmers find it very difficult in making rational decisions when faced with risks. Crop insurance is one of the solutions that farmers can use when faced with risks. On the other hand, farmers that are faced with many problems adopt the innovation of crop insurance. This decision-making process consists of a series of actions and choices over time, through which a farmer evaluates an innovation and decides whether to incorporate it into his ongoing practices. Due to the diversity of social, economic and natural factors influencing the adoption of an innovation, making such a decision is not a simple process. Interference by the private sector and government polices (subsidized prices, low interest loans and extension campaigns) add to the complexity of the decision process.

Agricultural education, history of risk, the amount of debt to credit institutions and banks, manufacturing and product rate fluctuations and rate insurance, affect in the participation of farmers in insurance scheme (Baquet and Smith, 1996). Farmers' awareness of the importance of insurance and its effects on their income supports the insurance (Baker, 1990). The study demonstrated that changing the amount of insurance could persuade exploiter with different degrees of risk aversion crops amenable to accepting insurance (William et al., 1993). Background exposure risk is one of the most important factors in accepting agricultural products insurance. Voluntary insurance of agricultural products may be more attractive to farmers that are faced with greater danger (Ahsan et al., 1987). Weather Based Crop Insurance Scheme (WBCIS) aims to mitigate the hardship of the insured farmers against the likelihood of financial loss on account of anticipated crop loss resulting from adverse weather conditions relating to rainfall, temperature, wind, humidity etc. Insurance holds great importance as farmers face a variety of risks and natural disasters such as weather risks, pests, and plant diseases.

Despite being an improvement over traditional yield-based insurance products, WBCIS has not generated anticipated impact. Most of the farmers in impact studies have cited delay in claims settlement and insufficient payouts as major pitfalls against greater uptake of the scheme amongst farming community (Zevenbergen, 2014, Raju et al., 2016). Demand for WBCIS among farmers is profoundly impacted by premium rates and basis risk, as documented in recent research (Hill et al., 2016). On the contrary, subsidizing premium rates to cover up basis risk and make insurance products more palatable to the

farmers is a costly proposition for the government and insuring agencies alike (Ricome et al., 2017); and climate change may even force premium rates to go higher (Tack et al., 2017). Many index insurance projects have thus not been able to create high demand, even after subsidies and significant extension efforts. Basis risk is often cited in insurance literature as the single biggest hurdle for the spread of weather insurance in agricultural areas (Jensen et al., 2016, Doms et al., 2018). The crux of effective index insurance lies in the design of its weather triggers and coverage of production risks (Marr et al., 2016). An index insurance product is rendered ineffective for farmers when it is unable to give payouts for yield losses. Thus, the effectiveness of the product can be greatly increased by its better linkage with production risks. In fact, high demand for index insurance has been documented when additional supporting factors like index effectiveness, favourable pricing options, credit facilitation and policy support have been provided (Jensen et al., 2018, Chantarat et al., 2017, Carter et al., 2017).

Figure 1: Land suitability for rainfed agriculture in Iran



Source: Mesgaran, M.B., et al. (2017)

Iran's land suitability with potential for rained agriculture was assessed based on soil properties, terrain, and a minimum precipitation threshold of 250 mm year^{-1}. Almost the entire central Iran (Yazd, Semnan, Markazi, and Esfahan), and the vast majority of land area in the eastern (South Khorasan and the southern part of Khorasan Razavi), southeastern (Sistan and Baluchistan, and Kerman) and southern (Hormozgan and Bushehr) provinces were found to be unsuitable for rainfed farming. Almost half the area of Khuzestan and three-quarters of Fars provinces was also characterized unsuitable. Over the entire east, only in the northern part of Khorasan Razavi province, is there a belt of marginally suitable lands satisfying the requirements of a potentially prosperous rainfed agriculture (Mesgaran, M.B., et al., 2017).

A sizeable acreage of current farmlands occurs in unsuitable and very poor suitability ranks. The production from these lands not only is low but also can cause environmental damage and hence subject to further production decline in the future. Land expansion is unlikely to add significantly to Iran's food production capacity. However, redistribution of lands from lower suitability ranks to more suitable lands can partially improve the overall sustainability of Iran's agriculture (Mesgaran, M.B., et al., 2017). Increased food production capacity should, therefore, be achieved through the adoption of certain modern agricultural practices (e.g. greenhouse farming, advance irrigation systems and improved germplasm),

particularly in areas where land suitability is not necessarily high. In pursuit of food sovereignty, Iran needs to balance its interest in increased food security against water sustainability.

Review of Literature

Mohammad Ghahremanzadeh et al. (2017) stated that in crop insurance design, the yield guarantee and the premium are very important parameters, both of which depend upon the yield distribution. Accordingly, the accurate modeling of yield distribution is essential for designing crop insurance contracts. This study employs historical county-level yield data for irrigated and dry wheat in East Azarbaijan Province, Iran for 1975-2013 to evaluate the effects of five alternative parametric distributions and generate the area yield crop insurance premiums. Results indicated that, in almost all cases, the premium rates with alternative distributions significantly differed from each other and that the beta distribution fitted the data the best except for some series for which the weibull distribution was the best. The results showed that premiums for wheat vary from 246,000 IRR per hectare in the coverage of 65% for Miyaneh to 460,000 IRR per hectare for Tabriz, and for dry wheat they vary from 265,000 IRR per hectare for Tabriz to 680,000 IRR per hectare for Maragheh. Moreover, it was found that the calculated premiums were less than traditional premiums, which would be affordable for both insured and insurers. The insured will pay lower premiums, and because the new methods are used to calculate the indemnities in this contract, and therefore there is no need for attending in individual farms to calculate the loss; it will be useful for the insurers, too.

Torkamani, Javad (2001) analyzed the effects of agricultural crop insurance on farmers' technical efficiency and risk attitude. Required data came from questionnaires that were completed by the Institute for Planning and Agricultural Economics of the Ministry of Agriculture. Farmers' technical efficiency and attitude toward risk were estimated using stochastic frontier production function and equally likely certainty equivalent method for both insured and non-insured groups. Results revealed that effects of agricultural insurance on farmers' technical efficiency were significantly positive in the three study regions. Results of estimating risk aversion coefficients of study farmers showed a positive effect of insurance on risk aversion coefficients. However, this effect was significant only in two of the climatic regions under study.

Given the problems in traditional crop insurance such as adverse selection (Just et al., 1999; Quiggin et al., 1993; Skees & Reed, 1986), moral hazard (Chambers, 1989; Coble et al., 1997; Smith and Goodwin, 1996) and transaction costs (Skees & Barnett, 1999), index-based crop insurance was introduced. Index insurance, unlike traditional insurance (which pays the indemnity based on individual losses), pay the indemnity based on the observed value of a specified "index" (area-level yield or some objective weather event or measure such as temperature or rainfall) or some other closely related variables. An index is a random variable. It is neutrally observable, reliably measurable, and highly correlated with the losses of the insured, and moreover the insured cannot influence it (Miranda & Farrin, 2012). The area yield crop insurance have been implemented in many countries including the United States, Canada and Mongolia whose results were satisfactory (Zhang et al., 2011). Three factors are important in offering the agricultural

insurance products ranges in each country: the willingness of the government to subsidize them, the existence of a viable infrastructure for providing insurance (including regulatory structures, trained loss adjusters, product delivery mechanisms, etc.) and the information and data available to do the actuarial analysis (Smith & Glauber, 2012).

Objectives of the Study

To assess the satisfaction of farmers who avail Weather based Crop Insurance in Iran

Hypothesis Testing

H_{01}: There is no significant influence of awareness about weather based crop insurance on customer satisfaction

H_1: There is a significant influence of awareness about weather based crop insurance on customer satisfaction

Research Methodology

The study is conducted with the objective of assessing the customer satisfaction of farmers who have availed weather based crop insurance in Iran. The study has adopted a descriptive approach using survey method. The required data for the study was collected through questionnaire. The population of the study was chosen using random sampling method which includes 382 wheat farmers who are applicants of weather index agricultural insurance. For the purposes of the study, statistical tools such as mean value, standard deviation and one sample test were used.

Data Analysis and Interpretation

Awareness about weather based crop insurance

Table: Awareness about weather based crop insurance

Not at all aware	Slightly aware	Moderately aware	Very aware	Extremely aware	Mean	SD
-	92 (24.08%)	168 (44%)	64 (16.7%)	58 (15.1%)	3.21	0.897

Source: Field Survey

The table shows the awareness about weather based crop insurance in farmers in Iran. It was found that 24.08% of the farmers were slightly aware of the insurance. 44% of the farmers were moderately aware. 16.7% and 15.1% of the farmers were found to be very aware and extremely aware about the insurance respectively. The mean and standard deviation of the awareness about weather based crop insurance in farmers in Iran was 3.21 and 0.897.

Information about weather based crop insurance

Table: Information about weather based crop insurance

	Frequency	Percentage
Other farmers	48	12.56
Bank (since taken crop loan)	225	58.90
Friends/relatives	32	8.37
Media	57	14.92
NGO	20	5.23
Total	382	100

Source: Field Survey

The table shows the information about weather based crop insurance. 12.56% of the farmers mentioned that they learnt about the insurance through other farmers. It was found that 58.90% of the farmers came to know about insurance through banks since they have taken crop loan. 8.37% of the farmers learnt about insurance through friends and relatives. 14.92% and 5.23% stated that they learnt about insurance through sources of media and NGO respectively.

Information about Premium

Table: Information about Premium

	Frequency	Percentage
Very Low	8	2.09
Low	32	8.38
Reasonable	96	25.13
High	185	48.43
Very High	61	15.97
Total	382	100

Source: Field Survey

The table displays the information about premium paid by farmers. 48.43% of the farmers found the premium of the insurance high and 15.97% of the farmers found it to be high. 25.13% of the farmers opined that the insurance premium paid by them was reasonable. About 10% of the farmers stated that the insurance paid was low.

Motivation Factor for availing weather based crop insurance

Table: Motivation Factor for availing weather based crop insurance

	Frequency	Percentage
Banks/Financial Institutions compelled farmers to insure	36	9.42
It is a protection against risk	210	54.97
Farmers knew about the benefits of insurance from other farmers insuring their crop	105	27.49
Low Premium	31	8.12
Total	382	100

Source: Field Survey

The table details the motivation factors in farmers for availing weather based crop insurance. It was found that 54.97% of the farmers availed insurance as it is a protection against risk. 27.49% of the farmers stated that insurance policy was availed by them as they knew about the benefits of insurance from other farmers insuring their crop. 9.42% of the farmers stated that they availed insurance policy as they were compelled by the banks and financial institutions. 8.12% of the farmers were motivated to avail weather based crop insurance due to payment of low premium.

Satisfaction with weather based crop insurance

Table: Satisfaction with weather based crop insurance

	Frequency	Percentage
Highly Satisfied	85	22.25
Satisfied	186	48.69
Neither Satisfied nor Dissatisfied	64	16.75
Dissatisfied	25	6.54
Highly Dissatisfied	22	5.76
Total	382	100

Source: Field Survey

The table displays the satisfaction of farmers availing weather based crop insurance. It was found that 48.69% of the farmers were satisfied. 22.25% of the farmers were highly satisfied. 16.75% of the farmers were neither satisfied nor dissatisfied. About 11% of the farmers were dissatisfied.

Testing of Hypothesis

H_{01}: There is no significant influence of awareness about weather based crop insurance on customer satisfaction

H_1: There is a significant influence of awareness about weather based crop insurance on customer satisfaction

Table 4.65(a): Descriptive Statistics for satisfaction of farmers availing weather based crop insurance

	N	Mean	Std. Deviation	Std. Error Mean
Satisfaction	382	3.89	.560	.036

Table 4.65(b): Results of one-sample t-test for quality of service provided to customers

	Test Value = 3.4					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Satisfaction	16.027	381	.000	.049	.462	.588

When one sample t test was performed to verify the influence of awareness about weather based crop insurance on customer satisfaction, taking 3.4 as standard, it was found that the observed mean for satisfaction was 3.89. 't' value of 16.027 was found to be significant with p-value of **.000**. In other words, **the awareness about weather based crop insurance has an influence on customer satisfaction. Hence, the alternative hypothesis is accepted.**

Conclusion

Agricultural insurance is a confident supporting tool for financial resources of agricultural producers and investors. It is an effective tool for risk management in agriculture and its adoption by farmers as a new technology is dependent on many factors. In this study, the satisfaction of farmers who avail Weather based Crop Insurance in Iran were investigated. It was found that farmers opined that they availed insurance as it provided adequate protection against risk. Also, they mentioned that the premium paid by them was high. The hypothesis was tested and it was found that awareness about weather based crop insurance has an influence on customer satisfaction. It is recommended that sufficient awareness must be made to all farmers with respect to benefits of the insurance policy and efforts must be made by the institutions to reduce the insurance premium in order to attract major percentage of farmers toward crop insurance. As traditional insurance plans were found to have problems such as high transaction costs and asymmetric information challenges such as moral hazard and adverse selection, adoption of Weather-Based Crop Insurance (WBCI) is recommended for rainfed wheat as an efficient approach for risk management as it does not have the problems of traditional insurance in Iran.

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