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Assessing the moral hazard impact of mango farmers in Chabahar

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ABSTRACT- The agricultural sector encompasses activities that are exposed to diverse risks. Risks in the agricultural sector are unavoidable but manageable. Crop insurance is a management tool in the agricultural sector. Crop insurance is a strategy to cope with the production risks of the agricultural sector and to secure farmers' income in the future. Mango is a major horticultural and exporting crop in Sistan and Baluchestan province and in Chabahar with a key role in local economy. The present study aimed to use cross-sectional data of 2016-2017 for 285 mango farmers to explore the phenomenon of moral hazard and its economic consequences. Discriminant analysis and t-test were applied for economic modeling and data analysis. The results did not show any moral hazards in the insured group. So, we can improve the crop production and productivity by focusing on the role of the insurance. The determination of premium on the basis of the regional conditions and farmers' economic status can have desirable impacts on production.

INTRODUCTION

Agriculture is perceived as a risky activity because of the unstable and risky nature of the production conditions (Sardar Shahraki et al., 2016). It constitutes a major economic sector of Iran so that it accounts for 25 percent of gross domestic production, 23 percent of employment, and a considerable part of non-oil export revenues (Torkamani, 2009). Nature instability and unpredictability of natural events are a source of uncertainty in the agricultural sector for its productions and farmers' future and influence decision-making and users' activities from different aspects so that activities in the agricultural sector is accompanied with risk and farmers are always unsure about their future income. Farmers, rural communities, and policy-makers have developed a wide range of risk mitigation programs to cope with these risks (Sardar Shahraki, 2016).

A major challenge for this sector is its unprotected exposure to nature, natural factors, and variable climatic conditions, which raise the risks for investors and users. Therefore, insurance is a vital instrument to mitigate risks by their distribution among users. So, to make a balance in the appealing of the industrial, service and agricultural sectors, it is imperative to use insurance wisely at different levels including (i) labor insurance for those who work in the agricultural sector, (ii) the insurance of crops, production factors, and the products of the agricultural sector, and (iii) the insurance of investments and basic resources or developing an appropriate model for insurance against risk factors including flood, earthquake, chilling, and so on (Shirzad, 2003).

Agriculture is replete with various risks. In this sector, natural, social, economic and personal risks conspire to provide fragile and vulnerable conditions for producers. The emergence of insurance, in general, and agricultural insurance, in particular, is the result of uncertainty in the economic activities (Kohansal and Rahnama, 2009).

Crop insurance is a bilateral economic process in which a contract is made between a user of the agricultural sector (institution or person) and a crop insurance firm to compensate for the likely losses in order to accomplish food security (Sardar Shahraki et al., 2018).

By enhancing users' risk-taking and the sense of safety in farmers, agricultural insurance lays the ground for the proper and efficient use of production factors, investment, and the alleviation of fluctuations in crop production and agricultural income (Karami et al., 2008).

Index-based insurance is, in fact, a low-cost approach to crop supply that partially resolves the problems of multiple-peril crop insurance including moral hazards and executive costs. In index-based crop insurance, the indemnity is not paid on the basis of farm yield criteria, rather it is determined on the basis of regional yields or some weather parameters (Afrasiabi et al., 2013; Shahraki and Sardar Shahraki., 2014).

Mango is an important exporting product of Iran. It is important to consider the impact of climatic conditions, especially temperature and rainfall, on this crop.

Sistan and Baluchestan province in the southeastern part of Iran enjoys a high potential in the agricultural sectors. Mango is an important and strategic crop of this province that plays a major role in local economy. This region is struggling with hazards like storm and drought that impose extensive damages to horticultural crops (Anonymous, 2011).

In 2016, of about 2.87 million ha of the orchards in Iran (including fertile and non-fertile ones), about 831,000 ha (30.1 percent) were accounted for by subtropical fruit trees, of which 84.8 percent was accounted for by fertile orchards and 15.2 percent by non-fertile orchards. Of 2.87 million ha of tropical fruit tree orchards, 31.4 percent is planted by mango producing 19.8 percent of total tropical fruit products. This is over 80,000 ha in Sistan and Baluchestan province with an annual production rate of 527,000 t, of which over 8,000 ha is allocated to tropical fruit trees with annual production of 158,000 t. About 1,400 ha of these orchards are planted with mango trees of which 880 ha are fertile and the rest is non-fertile (ICT Office of Ministry of Jihad-e Agriculture, 2016; Reports of Jihad-e Agriculture Organization, 2016). In 2018, 300 ha of banana and mango orchards and 400 t of these fruits were ruined because of unexpected rains, causing heavy losses to orchard owners of Chabahar County (Reports of Jihad-e Agriculture Organization, 2018).

Moral hazards have been subject to extensive studies, some of which are reviewed below.

Nikooie and Torkamani (2002) studied the impacts of moral hazards and adverse selection for wheat crop in Fars province, Iran. They reported that larger farms were related to higher probability of adverse selection of insurance fund. Also, the prevalence of moral hazards in wheat insurance was implicated for the negative impact of insurance on wheat yield in cold mountainous climate and its relatively negative impact on its yield in hot desert climate.

Ezzatabadi (2006) focused on systemic risk of production, moral hazards and adverse selection of insurance for pistachio. They found that the systemic risk of pistachio production is very low in Iran and does not make any problems for its insurance scheme. But, the moral hazards and adverse selection have been documented for insurance scheme recommendations (fair insurance) whereas these events do not exist in the present insurance scheme of pistachio and this scheme has high implementation costs.

Hyde and Vercammen (1997) studied moral hazards within a theoretical framework. They reported that when there are moral hazards, access to cooperation tools for loss payment is necessary for optimal contracts so that no optimal point will exist in the lack of such tool.

Skees et al. (1997) explored the impact of the insurance contract on crop yield. They suggested the use of reasonable insurance to cope with such problems as moral hazards and adverse selection.

Babcock and Hennessy (1996) focused on the impacts of agricultural insurance on planting pattern, soil erosion, and environmental degradation. They concluded that individuals who participate in crop insurance schemes apply chemical fertilizers to a lesser extent.

Smith and Goodwin (1996) argue that moral hazards and adverse selection are two major barriers to fair crop insurance. They examined the relationship between the consumption of agricultural inputs and crop insurance for a sample of wheat growers in Kansas, the US. They reported that moral hazard incentive drives insured farmers to use less chemical inputs.

Vereammen and van Kooten (1994) studied the presence of moral hazard cycles in insurance schemes and found that by using moral hazard cycles, farmers neutralize methods employed for facing this phenomenon.

Innes and Ardila (1994) studied the influence of crop insurance on planting pattern, soil erosion, and environmental degradation. They revealed that yield and income insurance schemes enhance production, thereby aggravating soil erosion and environment degradation, whereas land value insurance leads to less production and consequently, the improvement of the environment.

In a study on factors underpinning the willingness of wheat growers to participate in recommended weather index insurance scheme in Ahar County, Iran, Afrasiabi et al. (2013) reported that wheat growers exhibited the willingness to pay for the average premium of the scheme. Also, the estimated parameters of the Logit model showed that the participants were willing to pay 91,470 IRR/ha for premium.

Tavakkoli et al. (2016) analyzed the strategies of farmers to adapt to drought in Kermanshah province. They found that the crisis management approaches were positively and significantly related to the intensity and frequency of drought perceived by farmers, land area, irrigated land area, and their individual and family characteristics.

Fani and Marufi (2017) explored the effect of the drying of Urmia Lake on the vulnerability of the natural environment and human community around the region. They revealed that given the residence of over 3,000,000 people, the orchards, agricultural lands, and diverse plant and animal species around the lake, its complete drying would seriously endanger the accommodation and safety of the local environment.

In a study on social vulnerability with respect to the natural disasters in China, Yang et al. (2015) found that the social vulnerability in China is more distributed in the east of China than in the west and that the spatial clustering has had a descending trend in recent years.

McEwan et al. (2017) addressed the abstract ethical discourse and moral experience of farmers in the north of Cape. They reported that working in sensitive cultural manners with productive communities and understanding how to organize own ethical world is crucial in dealing with the gap between abstract ethical discourse and moral experience based on producers' location and the supply of initiative effectiveness.

Natho and Thieken (2018) studied the adaptation of a large-scale method to assess and control direct economic losses induced by natural risks. This approach acts as a good starting point to estimate the large-scale losses. This approach to damage and documentation of events and report of standards allows continuous monitoring.

Huang and Moore (2018) studied farming under weather risk with respect to the indicators of adaptation, moral hazard, and selection on moral hazard. The results showed that adaptation interaction, moral hazard, and selection on moral hazard create a new vision about motives, actions, and hidden information in main crop markets and insurance.

Given the short background of crop insurance in Iran and inadequate welcoming by farmers, especially mango farmers, due to their lack of access to the province center and their not being informed of crop insurance as well as some structural deficiencies, it is necessary to develop a comprehensive crop insurance system and to examine crop insurance systems in Iran in the context of a coordinated set to match them with ecological, economic, and social characteristics of actors in the agricultural sector.

The review of the literature indicates that moral hazards are of crucial importance in research on agricultural and economic sectors. This study explores this phenomenon for mango in Chabahar as an important crop among insured and uninsured groups.

MATERIALS AND METHODS

Discriminant analysis model

Discriminant analysis is an advanced statistical method that explores different variables simultaneously and determines to which group an individual belongs. This method is very appropriate when the dependent variable is a multicategorical variable on which basis the whole sample can be categorized. In other words, discriminant analysis method is used for a linear combination of independent variables to check the dependence of an individual to either one of the two groups (Lekshmi et al., 1998).

When there are two groups, a linear function $\lambda' X$ can be defined to consist of *K* descriptor variables $X = (X_1, X_2, ..., X_k)$ that make the best discrimination between the two groups. Therefore, λ's should be selected so as to maximize the between-group variance of $\lambda' X$ as compared to its within-group variance (*X* and λ are vectors with *K* dimensions). In other words, discriminant analysis allows recognizing the variables whose means differed between two groups significantly. Then, these variables are used to predict which group the observations will be placed. Assuming n_1 observations for farmers who use insurance ($y = 1$) and n_2 observations for farmers who do not ($y = 0$), by definition, we can write that (Maddala, 1983):

$$\bar{X}_1 = \frac{1}{n_1}\sum_{i}^{n_1} X_{1i} \quad (1)$$

$$\bar{X}_2 = \frac{1}{n_2}\sum_{i}^{n_2} X_{2i} \quad (2)$$

$$\bar{X} = \frac{1}{n_1 + n_2}(n_1\bar{X}_1 + n_2\bar{X}_2) \quad (3)$$

$$S = \frac{1}{n_1+n_2-2}\left[\sum_{i}^{n_1}(X_{1i}-\bar{X}_1)(X_{1i}-\bar{X}_1)' + \sum_{i}^{n_2}(X_{2i}-\bar{X}_2)(X_{2i}-\bar{X}_2)'\right] \quad (4)$$

Where $\bar{X}_1$ and $\bar{X}_2$ denote the means of discriminant variables in the first and second groups, and $\bar{X}$ and *S* are the means of variables and the variance of observations in the two groups, respectively. Also, between-group variance is equal to $\lambda'(\bar{X}_1 - \bar{X}_2)^2$ and the within-group variance is equal to $\lambda' S \lambda$. *Λ* should be selected so as to maximize the following term (Maddala, 1983):

$$\Phi = \frac{\lambda'(\bar{X}_1 - \bar{X}_2)^2}{\lambda' S \lambda} \quad (5)$$

By differentiating Equation (5) against λ and equalizing it to zero, the λ value is obtained as below:

$$\hat{\lambda} = S^{-1}(\bar{X}_1 - \bar{X}_2) \quad (6)$$

By calculating the coefficients of discriminant variables, the average of discriminant function can be estimated for the two groups to be equal to:

$$\bar{y}_1 = \hat{\lambda}'\bar{X}_1 = (\bar{X}_1 - \bar{X}_2)' S^{-1}\bar{X}_1 \quad (7)$$

$$\bar{y}_2 = \hat{\lambda}'\bar{X}_2 = (\bar{X}_1 - \bar{X}_2)' S^{-1}\bar{X}_2 \quad (8)$$

To attribute a new observation to the vector of discriminant variables X_0, its discriminant function (y_0) can be calculated by the coefficients of discriminant function (Mansur et al., 1995):

$$\bar{y}_0 = \hat{\lambda}'\bar{X}_0 = (\bar{X}_1 - \bar{X}_2)' S^{-1}\bar{X}_0 \quad (9)$$

If y_0 is closer to $\bar{y}_1$, the new observation falls in the first group, and if it is closer to $\bar{y}_2$, it falls to the second group.

In fact, y_0 is closer to $\bar{y}_1$ when the following equation holds true assuming $\bar{y}_1 > \bar{y}_2$:

$$\left|y_0 - \bar{y}_1\right| > \left|y_0 - \bar{y}_2 \quad y_0 > \frac{1}{2}(\bar{y}_1 + \bar{y}_2)\right. \qquad (10)$$

Equation (10) is applied when the two groups have the same number of observations. Otherwise, the following equation is used:

$$y_0 = \frac{1}{n_1 + n_2}(n_1 y_1 + n_2 y_2) \qquad (11)$$

Where n_1 and n_2 are the number of observations in the first and second groups, respectively.

For classification with discriminant analysis, we need a criterion to attribute the new observations to one of the two groups. Boundary value is one of the criteria used for this purpose. To calculate this criterion, we first obtain discriminant function values for all observations using the estimated coefficients of the discriminant function. Then, if both groups have an unequal number of observations, then the following equation is used to calculate the median (Salami and Ansari, 2007):

$$MiddleValue = \frac{n_0 \bar{Z}_0 + n_1 \bar{Z}_1}{n_0 + n_1} \qquad (12)$$

Where $\bar{Z}_0$ and $\bar{Z}_1$ represent the means of discriminant function for the two groups and n_0 and n_1 represent the number of members of each group, respectively. When the value of discriminant function for a new observation is equal to or greater than the median, the new observation is attributed to the first group and otherwise to the second group (Mohtashami and Salami, 2007). To analyze by this method, we usually need to test between-group differences with a single-variable test. The equality of the means is judged with U or Wilks' lambda statistic. Wilks' lambda shows the significance of a variable when it is expressed individually between two groups of farmers – those who use insurance and those who do not. When this factor is small, it means that the means of the groups differ. But, when it is very close to 1, it implies insignificant difference in the means of the two groups. The standardized and non-standardized coefficients in the discriminant model show the contribution of each variable in the discriminant function. Non-standardized coefficients are indeed the coefficients of the variables when they are expressed in terms of the initial values. Standardized coefficients are used when the variables are standardized against the mean of 0 and standard deviation of 1. The values of discriminant function coefficient provide us with no measure to express the relative importance of the variables significantly differing between the groups. To this end, one can use the correlation between the discriminant function and the values of the variables whose results are included in matrix known as structural matrix. In fact, the values in the structural matrix reflect the linear correlation between the individual predictor variables and the discriminant function.

Press's Q test is employed to check if the classification with discriminant analysis significantly outperforms random classification. If press's Q is greater than the critical value in the table of χ^2 distribution with one degree of freedom, the classification by discriminant analysis can be said to be significantly different from random classification:

$$\text{Press's } QStatistic = \frac{\left[N - (nK)\right]^2}{N(K-1)} \qquad (13)$$

Where N shows the total number of observations, n represents the observations that have been classified correctly, and K denotes the number of the groups (Kohansal and Rahnama, 2009).

Sampling and sample size determination

The data for the study were collected from 285 mango farmers in Chabahar, Sistan and Baluchestan province of Iran by face-to-face interviews and a questionnaire in 2016-2017 growing season. We applied two-stage cluster sampling. Data reliability was confirmed by Cronbach's alpha using SPSS software package. It was estimated to be 0.85.

RESULTS AND DISCUSSION

To identify variables that are distinctive in the two groups, we used discriminant analysis that is an advanced and widely used statistical method.

Means of insured and uninsured groups

Table 1 presents the means for two groups of farmers – insured and uninsured. It shows that insured group has higher mean than uninsured group as the average of former group is 658789, 95632, 28987, 36895, 28987, and 139870, respectively.

Table 1. Means of insured and uninsured groups

Variable	Mean of insured group	Mean of uninsured group	Total mean
Capital	569851	658789	500258
Labor	20358	19586	180521
Machinery	42589	95632	65231
Herbicide	25478	36895	24569
Fertilizer	19874	28987	25698
Water	125036	139870	143589

Wilks' lambda test for the means of individual variables of the two groups

In discriminant analysis, to test the differences between the two groups in personal characteristics and willingness, it is necessary to use single-variable statistical tests to check between-group differences. Table 2 shows that the means of the variables "labor" and "herbicide" did not differ significantly between the groups, and Wilks' lambda statistic confirms this finding as it is close to 1. Therefore, these two variables are excluded from the discriminant analysis.

Table 2. Wilks' lambda test for the means of independent variables in the two groups

Variable	Wilks' lambda test	F-statistic	Significance level
Capital	0.852	25.368	0.000***
Labor	0.586	2.365	0.452ns
Machinery	0.365	345.2	0.000***
Herbicide	0.456	6.325	0.365ns
Fertilizer	0.987	8.544	0.0258***
Water	0.405	15.365	0.000***

***, ** and * show significance at the 1, 5 and 10%, respectively, ns denotes non-significance.

Estimation of discriminant analysis coefficients

According to Table 3, the column of standardized coefficients shows that the variable "seeding rate" has a negative sign, implying that its increase results in the loss of farmers' willingness to insure. The variables "capital", "machinery", "fertilizer", and "water" have positive signs which means their increase improves farmers' willingness to insurance.

The non-standardized coefficients are the coefficients of discriminant functions for the insured and uninsured groups. One unit increase in capital, machinery, fertilizer and water enhances discrimination degree by 0.05, 0.8, 0.25, and 0.20 units, respectively. Indeed, their increase results in higher willingness of farmers to use insurance.

Table 3. Estimation of coefficients in discriminant analysis model

Variable	Standardized coefficient	Non-standardized coefficient
Capital	0.857	0.045
Machinery	2.254	0.75
Fertilizer	0.089	0.35
Water	0.236	0.96

Values of structural matrix

According to Table 4 and Table 5, the variables of water, capital and machinery had the highest importance in discriminating the insured and uninsured farmers with the values of 0.857, 0.568, and 0.458, respectively. The next discriminating variable was fertilizer with the value of 0.265.

Table 4. Structural matrix of discriminant analysis model

Variable description	Value in structural matrix
Capital	0.568
Machinery	0.458
Fertilizer	0.265
Water	0.857
Canonical coefficient of correlation	0.854
Significance of whole model	302.255

Table 5. Means of insured and uninsured groups

Variable	Group	Mean	SD	Mean standard error
Machinery	1	1.0365	0.32569	0.03654
	0	1.5897	0.78546	0.07854
Proper substrate	1	1.1856	0.65447	0.02544
	0	1.7800	0.78965	0.6541
Fertilizations schedule	1	1.0563	0.32546	0.0254

The statistic $\chi^2 = 302.255$ for the equation that was formed to discriminate the two groups of farmers was significant at $p < 0.01$ level. It can be claimed that the means of all discriminating variables were simultaneously different between the two groups so that they can be used to distinguish the groups. The canonical coefficient of correlation was estimated at 0.854. This means that there is a quite good correlation between the individual variables and the discrimination degree. The higher the coefficient of correlation is, the more capable the model is in distinguishing the group members. In addition to the values showing the contribution of each variable in discriminant analysis model, the significance of whole discriminant function can be tested by overall fit of the data.

Then, t-test was performed on agronomic operation including irrigation schedule and method, chemical control and herbicides, fertilization schedule, appropriate substrate, sowing date and time, appropriate seeding rate, and machinery.

Table 6 shows that assumption of the homogeneity of variance and means was rejected for all studied factors and their smallness is confirmed. So, the insured group used more inputs than uninsured group and was more precise in agronomic operations. Therefore, we can conclude that insured group did not have moral hazards in the use of inputs and agronomic cares.

Agricultural production is one of the riskiest economic activities. Natural disasters, pests, and diseases are some causes of huge losses to farmers, and since a great part of agricultural producers, especially in developing countries, have limited financial capability, sometimes even the least loss can destroy them. This is why crop insurance is an important lever for agriculture development because this mechanism not only allows compensating for the losses by the small savings of a plethora of farmers paid as insurance premium, but it is also a tool to ensure security for farm producers. Obviously, crop insurance has an effective role to play, especially in the era of transition from traditional farming to commercial farming. Farmers in Iran are faced with higher levels of production risks in the agricultural sector because of the geographical location of Iran. This makes it more serious to deal with the mechanism of crop insurance.

Therefore, the present study aimed to apply the discriminant analysis model to explore the consequences of moral-economic risks facing mango farmers in Chabahar County. The results derived from standardized coefficients showed that seed had a negative sign and its increase results in the loss of farmers' willingness to use insurance. The variables of capital, machinery, fertilizer, and water had positive signs and their increase improves farmers' willingness. The non-standardized coefficients are the values of coefficients in the equation of discrimination of insured and uninsured groups. One unit increase in capital, machinery, fertilizer, and water causes the discrimination degree to increase by 0.050, 0.8, 0.25, and 0.20 units, respectively.

Table 6. Variance homogeneity test for independent groups

		Variance homogeneity test				
		F	p-value	t	Degrees of freedom	p-value (2-tailed)
Machinery	A	128.02	0.000	-5.656	255	0.000
	B			-5.656	352.999	0.000
Proper substrate	A	102.32	0.000	-6.254	255	0.000
	B			-6.254	356.155	0.000
Fertilizations schedule	A	125.365	0.000	-7.5	255	0.000
	B			-7.5	369.563	0.000
Chemical control and herbicide	A	125.200	0.000	-2.322	255	0.000
	B			-2.322	367.547	0.000
Irrigation schedule and method	A	25.365	0.000	-1.128	255	0.01
	B			-1.128	369.851	0.01

A: homogenous variance assumption; B: non-homogenous variance assumption

Table 7. Means homogeneity test for the independent groups

		Means homogeneity test			
		Means difference	SD of means difference	Confidence interval 95%	
				Maximum	Minimum
Machinery	A	-0.23564	0.25644	-0.36547	-0.25698
	B	-0.23564	0.25644	-0.36548	-0.25698
Proper substrate	A	-0.45879	0.25874	-0.36549	-0.25789
	B	-0.45879	0.25874	-0.36550	-0.25789
Fertilizations schedule	A	-0.65879	0.36547	-0.98647	-0.58796
	B	-0.65879	0.36547	-0.98647	-0.58796
Chemical control and herbicide	A	-0.36475	0.65872	-0.45879	-0.12587
	B	-0.36475	0.65872	-0.45879	-0.12587
Irrigation schedule and method	A	-0.32564	0.65212	-0.25698	-0.56987
	B	-0.32564	0.65212	-0.25698	-0.56987

A: homogenous variance assumption; B: non-homogenous variance assumption

In fact, when these variables are increased, the farmers' willingness to use insurance is enhanced. Our results are in agreement with some other studies in Iran including Nikooei and Torkamani (2002) in Fars province, Karim et al. (2013) in Razavi Khorasan province, Parva and Alibolandi (2015) in Iran, and Razaghi Bourjani et al. (2017) in Mazandaran province. Also, our results are consistent with other studies in other parts of the world including Vercammen and van Kooten, (1994), Innes and Ardila Babcock and Hennessy (1996), Smith and Goodwin (1996), Hyde and Vercammen (1997), Skees et al. (1997), Bryan et al. (2011), and Asante (2011) with respect to moral hazards of farmers and their consequences.

All in all, the present study used discriminant analysis model to explore the consequences of moral-economic hazards of mango farmers in Chabahar. The results showed that insured farmers outperformed uninsured ones in this sense (Table 7).

CONCLUSIONS

It is concluded that motivating policies should be developed for mango orchard owners. These policies can encompass the followings:

Since insured farmers outperformed uninsured farmers, it is recommended to give a bonus in a lottery to insured farmers who do not have losses to receive indemnity.

It is also recommended to use a discount coefficient of the premium for farmers who did not incur losses to receive indemnity in the previous year.

Since most mango farmers in Chahbahar County live in deprived, poor regions, it is recommended to determine premium in terms of local conditions and economic status of farmers.

Since mango farmers in the studied site are poorly aware of crop insurance, it is recommended to hold educational-extension courses by extension agents of Jihad-e Agriculture Organization.

The following recommendations can be put forth to accomplish a sustainable crop insurance system and to prevent insurance discontinuation by farmers. Adoption of motivating policies including:

Providing bonuses and gifts in lottery to farmers who have insured their crops, but have not received indemnity.

Giving premium discounts to farmers who did not receive indemnity in previous year

Promoting justice by the following policies:

Determining premium on the basis of local conditions and farmers' economic status Using flexible premium by varying the premium and indemnity

On-time payment of indemnity to losers

The extension of crop insurance fund to other fields including investment, infrastructure and other production factors in the agricultural sector Diversifying crop insurance services and premiums

Laying the ground for the cooperation of users in the development of crop insurance, gradually increasing insured premium and gradually decreasing government premium Laying the ground for the establishment of private insurance firms in the agricultural sector and gradually eliminating the benefits of the governmental insurance and/or establishing similar benefits for the private insurances with an emphasis on insurance fund competition in the field of economic insurance.

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بیمه

انبه

چکیده- بخش کشاورزی از جمله فعالیتهای همراه با مخاطرات گوناگون است، گریز از ریسک در بخش کشاورزی اجتناب ناپذیر ولی قابل مدیریت می باشد. یکی از ابزار های مدیریت در بخش کشاورزی بیمه محصولات کشاورزی است. بیمه محصولات کشاورزی، از جمله راهکارهای مناسب برای غلبه بر ریسک حاکم بر تولید در بخش کشاورزی و افزایش اطمینان خاطر کشاورزان نسبت به درآمد آینده می‌باشد. انبه یکی از محصولات مهم باغی و صادراتی در استان سیستان و بلوچستان و شهرستان چابهار است که نقش بسزایی در اقتصاد این منطقه دارد. در این پژوهش تلاش شده است با استفاده از داده‌های مقطعی در سال ۹۶- ۱۳۹۵ مربوط به ۲۸۵ کشاورزان انبه کار، پدیده خطر اخلاقی و پیامدهای اقتصادی آن مورد بررسی قرار گیرد. برای مدلسازی اقتصادی و تحلیل اطلاعات از آزمون‌های تحلیل تمایزی و t استفاده شده است. با توجه به نتایج مورد بررسی هیچ گونه مخاطرات اخلاقی در گروه بیمه شده دیده نشد، لذا نگاه ویژه به نقش بیمه باعث افزایش تولید و بهره‌وری محصول مورد بررسی خواهد شد و تعیین میزان حق بیمه بر مبنای شرایط منطقه‌ای و وضعیت اقتصادی کشاورزان می تواند تاثیرات مثبتی بر تولید بگذارد.