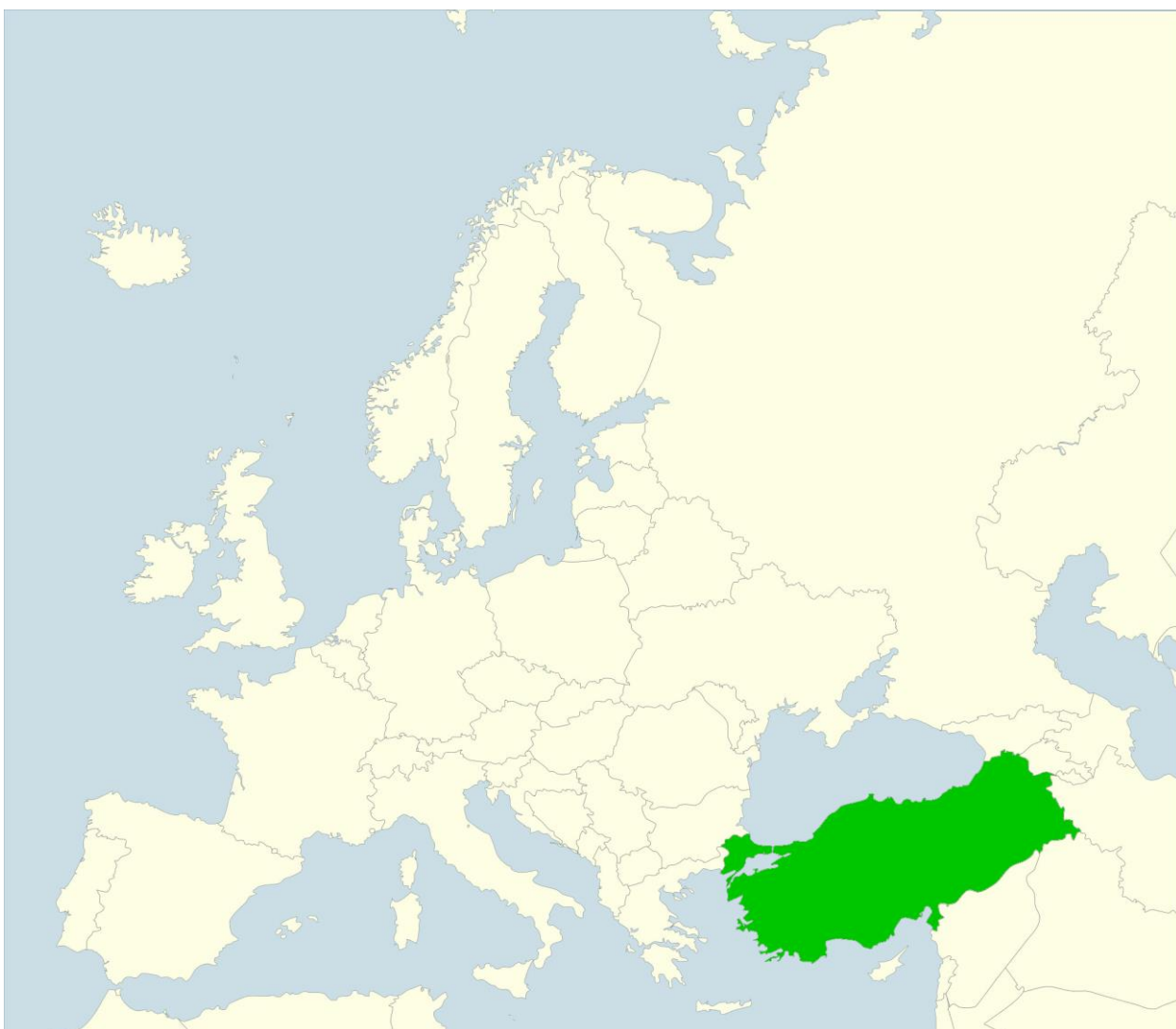


THE ANALYSIS OF FACTORS AFFECTING FARMERS TO TAKE OUT AGRICULTURAL INSURANCE: A CASE STUDY OF ALTINEKIN DISTRICT, KONYA PROVINCE OF TURKEY

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Abstract: Agricultural insurance is one of the management risk tools. This research aimed to analyze the factors affecting food crop farmers' agricultural insurance in the Altinekin District of Konya Province. To obtain data using a questionnaire by interviewing 66 food crop farms enterprises who did agricultural insurance in the previous year. The population sampling was calculated with a single-stage non-clustered probability sampling. Factors affecting farmers' agricultural insurance were analyzed by Binary Logistic Regression. The results of the analysis of factors affecting farmers' willingness to take out agricultural insurance were farmers age, education, land size, sources from which they receive information on agricultural insurance, and the amount of support paid by the state, the amount of debt, pure product and agricultural income. The sources from which they received information on agricultural insurance had negative effect. The other factors have a positive effect. Providing education and advertising about agricultural insurance to farmers can increase the willingness of farmers to take out agricultural insurance. Support in the form of assistance on agricultural insurance of the government is also needed.

Keywords: Agricultural insurance, Willingness to take, Risk, Crop Production, Konya

Highlights:

- Altinekin district has one of the largest numbers insured farmers in Konya Province.
 - In the last five years, 62% of farming activities was affected by the natural risk.
 - Common natural risks faced by farmers are storm, hail and drought.
 - As many as 65% of farmers take out agricultural insurance for the following year.
 - Age, education, amount of debt, land size, information resources, government support, pure income and agricultural income affect the farmers to have agricultural insurance.
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1. Introduction

The agricultural sector is a very important sector for countries that depend on agriculture. To agricultural countries, this sector generally provides a large percentage of the gross domestic product. Besides, agricultural products will always be needed by human's life. Agricultural activities are always faced with risks. As a sector that depends on nature, the agricultural sector has a wide spectrum of risks, especially those related to climate and nature (Kimura et. al., 2010). Risks can have detrimental outcomes including lower income, financial bankruptcy, food insecurity and human health (Van Winsen et. al., 2013). The potential impact caused by a disaster affects the value chain. The negative impact not only physical damage but also affects industrial output in sectors that depend on agriculture. Crops tend to be most affected by floods and storms (FAO, 2016). Climate change has an impact on agricultural production, the quality and quantity of production, and the income of farmers. Drought rarely causes severe damage (Lipińska, 2016). Between 2005 and 2015, natural disasters cost the agricultural sector in developing economies \$ 96 billion in damage or loss of crop and livestock production (FAO, 2018). As a sector that contributes to the Turkish economy, risks are a major challenge for the sustainability of agriculture. Income fluctuations are also caused by the risk of uncertainty in the production, harvesting and marketing processes. Changes in state policies also affect farmers' income. Turkey stated, to reduce the impact of risks faced by farmers, it encourages farmers to manage these risks. Agricultural insurance is a risk management mechanism to ensure income stability. Actions to strengthen the resilience of the agricultural sector and increase investment for food security and productivity and to anticipate the impacts of climate change are needed to protect farmers when facing risks (FAO, 2016). Agricultural insurance is one of the efforts that can be applied for risk management. Agricultural insurance transfers risk from producers to others. The premium paid to the insurance company is a risk transfer fee.

Participation in agricultural insurance programs can increase access to credit because it is associated with a reduced risk of default (Reusche et. al., 2014).

Agricultural insurance in Turkey was implemented in 2006 under the name TARSIM which consists of 16 agricultural insurance companies. The Turkish government provides a premium payment subsidy of 50% (Çetin and Turhan, 2013). Konya is one of the provinces with the largest agricultural area in Turkey, but the number of farmers who carry out agricultural insurance is only 4.8% and put on the fifth ranks of provinces from the total farmers who carry out agricultural insurance in Turkey (TARSIM, 2018). The study area has the largest agricultural production area in Turkey. Konya Province is one of agricultural center in Turkey. Land area for food crops in Konya Province took the first place with 9.49% of total area. The population employed in agriculture constitutes 18.2% of the total population (Konya Chamber of Commerce, 2020). In the research area, family labor is used in agriculture and they work as unpaid family labor. In the research area, there is a high dependency between the income of the people and the agricultural sector. The success of production affects the economic stability of the farming family. In the study area, there has been a loss of 20–80% in production due to hail, drought and storm, which have a production risk for the last 5 years. However, climatic risks are not at the same level and intensity every year.

Dry and semi-arid areas in Turkey covers 51 million hectares. Changes in the amount and distribution of rainfall seriously affecting dry agriculture. Hail causes significant damages in many areas, especially in the agricultural sector. In 2018, there was a snow disaster in Konya (General Directorate of Meteorology, 2019). Research conducted in Konya in 2017 showed that the natural risks faced by farmers are pests, epidemics and animal mortality. The social risk faced by farmers were illness or death of farmers. In another study, the main sources of risk faced by apricot farmers in Turkey were spring freeze (Gunduz et. al., 2016). Risk sources based on the economy are the most important thing affecting the performance of farmers in wheat agriculture. Wheat farmers presume financial risks and climate change are important in a variety of responses; Diversification and Planning, Market Networking and Irrigation, Management and Optimization, Off-Field Income. The other four risk components (Enterprise Risk, Price and Human Risk, Infrastructure and Don, Marketing and Technology) are related to more than one risk management strategy (Hayran, 2019). It is necessary to know the reason for farmers to take out agricultural insurance and the factors that influence farmers to take out agricultural insurance. It will be additional data for evaluating risk management programs that have been implemented and further policy of risk management. This study aims to examine willingness to take out agricultural insurance in Altınekin District, Konya Province. The specific objectives are to describe the socio-economic characteristics of the farmers and analysis of factors affecting farmers to take out agricultural insurance.

2. Theoretical Background

Agriculture is highly dependent on weather, climate, land and water for its ability to thrive, making it vulnerable to natural disasters. Natural disasters have a direct impact on reduced production which means economic losses for farmers, rural livelihoods and affect agricultural growth. Natural disasters will have an impact along the value chain in the agricultural sector (FAO, 2018). Natural factors (climate change), pests and diseases, social and economic events, technological and ecological changes are sources of risk and uncertainty. These factors cause problems in the specialization of agricultural products, capital accumulation and the use of technology (Oğuz and Bayramoğlu, 2018; Çetin and Turhan, 2013).

Risk is imperfect knowledge where the probabilities of the possible outcomes are known. Risk as an uncertain consequence is particularly an unfavourable exposure or consequence. Risk is not value-free, usually indicating an aversion of some possible consequences (Hardaker et. al., 2015). Type and sources of risk in agriculture are production risk and technical risk, price risk or market risk, financial risk, institutional risk including relationship risk, human risk (Hardaker, 2004; Kahan, 2008). Risk management is needed to reduce the impact of losing obtained farmers against risks. The right strategy for risk management is an important point for dealing with risks. The principle of risk management has shifted from its origin by trying to transfer risks to third

parties, taking advantage of risks and opportunities by reducing the level of risk itself (Hopkinson, 2012).

There have been many studies on agricultural insurance. Previous research showed factors that influenced to take out agricultural insurance were the age of the farmers, level of education, access to additional services, farm income, land area, the risk of continuous disasters, the number of farmer families, food crop income, request to expand the scope of agricultural insurance, investment outside of farming, lack of awareness, socio-economic factors and stakeholder-related (Tümer, 2011; Ertan and Gök, 2012; Falola et. al., 2013; Liesivaara and Myyra, 2014; Nyabochwa, 2015; Aydın et. al., 2016; Kızıloğlu, 2017; Afroz, et. al., 2017; Tümer et. al., 2019; Kaplan et. al., 2019). Some studies on agricultural risk of various agricultural products such as land size, weather conditions also have no impact on insurance purchasing decisions (Enjolras et al., 2012; Njue et al., 2018; Tümer et al., 2019). Considering by social security status, farmer's experience, membership of a cooperative, agricultural income level, non-agricultural income status, agricultural advisory status, internet use, agricultural credit use, tractor ownership, farmers' experience in apple production, shapes of Apple orchards and varieties of apples grown, showed a significant difference between farmers who participate in government support programs and those who did not (Yilmaz, 2014). In another study, shown there were differences between insured and non-insured farmers. The result of the analysis considering educational level, household size, agricultural credit, amount of production, type of land, the purpose of grape growing, type of irrigation, soil testing situation, information sources about government-subsidised crop insurance of farmer, the participation of farmers in extension activities about grape production, agricultural advisory status of farmers and status of receiving an agricultural support (Yilmaz et. al., 2017).

The previous study showed the importance of socio-economic characteristics factors in the farmers that influence them to make decisions. Heterogeneous research results indicate the importance to know the factors that influence farmers in purchasing agricultural insurance. Based on them, this study aimed to determine the factors affecting crop producer's farmers' to take out agricultural insurance in Altinekin District of Konya Province.

3. Methodology

3.1 Study Area

Konya Province is one of the agricultural home-based in Turkey. More than 65% of the total area of Konya Province is used as agricultural land with an irrigation area of 5.4 million or 30% of the total agricultural area in Konya. In 2019, the total land area for food crops in Konya reached 9.49% of the total food crops area in Turkey. The value of agricultural food crops in Konya Province was 6.2% of the total food crops value in Turkey (Konya Chamber of Commerce, 2020). Altinekin is one of the most important agricultural area in Konya with a surface area of 1,165.3 km². The geographical location of Altinekin District is located between 38° 08' and 38° 34' latitudes and 32° 32' and 32° 58' longitudes (Yıldırım et. al., 2018). The average annual temperature is 10.90°C with 373.5 mm of precipitations. There are 645,960 decares of agricultural land in Altinekin. More than 69% of the land is wetlands. Wheat and sugar beet are the most grown products, with sunflower and pistachio placed in the third and fourth positions of the most grown products (Altinekin, 2015; Konya Chamber of Commerce, 2020). In 2013, the sources of the risk were climatic factors, farm location, social factors, diseases and pests, capital, technology, market and financial factors. Map of Konya Province and Altinekin District shown at figure 1.



Fig 1. Map of Konya Province with Altınekin District.

3.2 Data collection and data analysis techniques

The research was conducted on farmers who were in the Altınekin District. Altınekin District was chosen because this district is one of the largest numbers of farmers who carry out agricultural insurance (3085) in Konya Province. According to the purpose of the study, the interviewed farmers were only crop production farmers who carried out agricultural insurance. There were 3085 crop production producing farmers in Altınekin district of Konya province, which constituted the main framework of the study and the population sampling was calculated as 66 with a single-stage non-clustered probability sampling with a 10% margin of error at 90% confidence limits (Salkind, 2012; Oguz & karakayaci, 2017).

$$n = \frac{Np(1-p)}{(N-1)\sigma_{p_x}^2 + p(1-p)}$$

where:

- n = sample of population
- N = the number of enterprises of population
- σ_{Px}^2 = the ratio of variance
- p = 0.5 (probability of event occurrence)

Most of the results of the study were presented in tabular and descriptive forms. Descriptive tools like frequency distribution, percentages, averages and ranking techniques were used to analyse the socio-economic characteristics of the respondents. The economic value obtained from the study area is converted from TL to USD. According to TCMB (Central Bank of the Republic of Turkey) in December 2019, the USD to TL exchange rate was 1 USD = 5.94 TL (TCMB, 2019). The factors used in the analysis were the most dominant influence factors on farmers' decisions. The socio-economic characteristics of farmers were determining factor in decision making. In addition, support from the government also needs to be examined to determine the influence of the government on farming activities. To analyze the factors that affect farmers' willingness to take out agricultural insurance, binary logistic regression was used. Logistic regression was used when the dependent variable is categorical (Tranmer and Elliot, 2008). General functional representation of logistic regression models is given below (Gujarati, 2009):

$$F(BXi) = \frac{\exp(BXi + \epsilon_i)}{(1 + \exp(BXi + \epsilon_i))}$$

The dependent variable is whether the use of packaging is important or not.

- B = The coefficient vector of explanatory variables
- Xi = Number of explanatory variables
- ϵ_i = Error term

Possibility of the decisiveness of factors affecting the significance of packaging:

$$Pi = \frac{1}{(1 + e^{Xi})} ; Pi = \frac{Pi}{1 - Pi} + \frac{1 + e^{Xi}}{1 + e^{Xi}} = e^{Xi}$$

- Pi = probability of the dependent variable
- e = 10-base natural logarithm and is approximately 2.30
- Zi = B0 + BiXi

For this study, the equation is expressed explicitly as

$$P = F(X1, X2, X3, X4, X5, X6, X7, X8, X9 \epsilon_i)$$

Where,

- P = Willingness to take out agricultural insurance (Dependent variable)
- X1 = Age (Years)
- X2 = Education (Level 1: Primary School, 2: Middle School, 3: High School and above)
- X3 = Debt amount (\$)
- X4 = Land (0: Property, 1: Rent)
- X5 = Land size (da)
- X6 = Agricultural insurance information resources satisfaction
- X7 = State support amount (\$)
- X8 = Pure income (\$)
- X9 = Agricultural income (\$)

4. Results

4.1 Socio-economic characteristics of the farm businesses

In table 1, it is shown that the average age of farmers in the study area was 47.30 years. In another study, it was shown that the age of farmers in Konya was 46.23 years (Tümer et. al., 2019). The average household size in the study area is 5 people. In the study area, the average farmers education were 6.27 years, which means the farmers complete their studies at junior high school. The average of farmers' agricultural experience was 30.22 years. Male Labour Unit Coefficients was used to calculate the workforce capacity. In the study area, family labor was 80.25% and foreign labor force was 19.75% of the total workforce.

Tab 1. Socio-economics characteristics of the agricultural businesses. Source: survey results

Variables	Mean	Std. Deviation
Age of household head (Years)	47.30	10.40
Household size	4.50	1.74
Education (Years)	6.27	3.23
Farming experience (years)	30.22	10.53
Labour (day)	767.98	338.21
Farm size (da)	578.43	1,117.23
Food Crops insurance premium amount (\$)	801.67	1,939.92
State support amount (\$)	3,213.09	6,726.48
Debt (\$)	43,134.62	50,193.02
Farm income((\$)	67,345.54	138,182.02
Pure Income (\$)	68,262.87	140,468.27

The average land ownership in the study area was 578.43 da. There were 12 food crops produced in the study area. These were wheat, barley, sunflowers, sugar beet, corn, birdseed, pumpkin, dried beans, potatoes, alfalfa, fig trees, and oats. The most grown plants were wheat, barley, sugar beet, corn and pumpkin. The insured crops consist of wheat, barley, sunflower, corn, and sugar beet. The insurance premium paid by farmers in a year was 801.67 \$. In one year, the average subsidy received by farmers from the government was 3,213.09 \$. The average farmer in the study area had a debt of 43,134.62 \$. The farm income of farmers was 67,345.54 \$. Agricultural income is one of the criteria for success in farming activities. The value of the farmer's pure income in the study area was quite high. The average pure income received by farmers was \$68,262.87.

As many as 80.30% of farmers in the study area were registered with BAĞKUR for social security insurance (table 2). About 96.96% of farmers were members of agricultural organizations. Registered farmers received information and support agricultural activities. Agricultural organizations also helped farmers to sell agricultural products. In the last five years, 62.12% of farming activities were affected by the risk. Common risks faced by farmers are storm, hail and drought. From the study area, as many as 65.15% of farmers want to take out agricultural insurance for the following year. Agricultural insurance chosen by farmers as a risk management effort. Besides, farmers who applied for loans at the bank should be registered in the agricultural insurance system.

Tab 2. Characteristics of the farmers. Source: survey results

Variables	Category	Frequency	Percentage
Social security	SSK (Social Insurance Institution)	8	12.12
	BAĞKUR	53	80.30
	Pension fund	5	7.58
Agricultural organization membership	Yes	64	96.96
	No	2	3.04
Affected with risk	Yes	41	62.12
	No	25	37.88
Willingness to take out agricultural insurance of food crops	Yes	43	65.15
	No	23	34.85

4.2 The analysis of factors affecting farmers' willingness to take out agricultural insurance

To analyze the factors affecting farmers' willingness to take out agricultural insurance were estimated by Binary Logistic Regression analysis. The $X^2(8)$ value ($p=0.007$) of the binary logistic model indicates that the model is statistically usable. Only statistically important variables were emphasized in the model. The coefficient of determination showed how much the ratio of the dependent variable can be explained by the independent variable. The value of Nagelkerke R Square shows how good the regression model used. Nagelkerke R square value is 0.742 or 74.2%, it shows that willingness to take out insurance coverage can be explained by the factors (age, education, the debt amount, land ownerships, land size, agricultural insurance information sources, state support amount, pure income and agricultural income). The remaining 25.8% is explained by other factors than the model. The difference of the significant (p value) shows the level of confidence differences and the level of error in the study. The confidence interval is determined by the margin of error. The confidence intervals used in the study were 90%, 95%, and 99%.

At 99%, confidence level for Age (year) showed a positive effect between age and willingness to take out agricultural insurance. Therefore, an increase in the age of the farmer will increase the willingness to take out agricultural insurance by 1.408 times. When the farmers are older, they have more experience, it causes the increase of willingness to take out agricultural insurance.

At 95%, confidence level for education factor showed a positive significant effect between education and willingness to take out agricultural insurance. An increase in one education level led to a 55,738-fold increase in willingness to take out agricultural insurance. At 90%, confidence level for the amount of debt received by farmers (USD) revealed a positive effect between the amount of debt and the willingness to take out agricultural insurance. Therefore, the increase in the amount of a unit debt, the willingness to take out agricultural insurance increases 1,000 times. Farmers who get credit are required to make agricultural insurance.

Tab 3. Analysis of factors affecting farmers' willingness to take out agricultural insurance. Source: survey results

		B	S.E.	Sig.	Exp(B)
Step 1 ^a	Age	.342	.130	.009***	1.408
	Education	4.021	1.728	.020**	55.738
	Debts	.000	.000	.065*	1.000
	Land ownership	-.146	2.335	.950	.864
	Farm size	.030	.012	.011**	1.031
	Information	-5.636	2.551	.027**	.004
	State support	-.001	.000	.015**	.999
	Pure income	.000	.000	.088*	1.000
	Income	.000	.000	.073*	1.000
	Constant	-4.756	4.962	.338	.009
-2 log likelihood		23.582 ^a			
Chi-square (df 8)		21.137			
Sig.		.007			
Nagelkerke R Square		.742			
* p<0,01 the confidence level 99%					
** p<0,05 the confidence level 95%					
*** p<0,1 the confidence level 90%					

With 95%, confidence level for farm size (da) factor has a positive significant effect between land size and willingness to take out agricultural insurance. The increase in the size of 1 unit of land caused the willingness to take out agricultural insurance to increase 1,0310 times. At 95%, confidence level for the factor of which sources that farmers get information about agricultural insurance showed a negative effect between the sources from which they receive information on agricultural insurance and the willingness to take out agricultural insurance. The increases of 1 unit of agricultural insurance information resources and the willingness to take out agricultural insurance by 0.004 times. At 95%, confidence level for the amount of support paid by the state (USD) factor revealed a positive significant effect between the amount of support paid by the government and the willingness to take out insurance. The increase in 1 unit of state support caused an increase in the willingness to take out agricultural insurance. At 90%, confidence level for pure income factor has a significant effect between the amount of pure income and the willingness to take out agricultural insurance. The coefficient value (B) is positive, so the increase in the amount of 1 unit of pure income increases the willingness to take out agricultural insurance 1,000 times. At 90%, confidence level for agricultural income showed a positive relationship between the amount of agricultural income and the willingness to take out agricultural insurance. Therefore, the increase in the amount of 1 unit of agricultural income, the willingness to take out agricultural insurance caused an increase of 1,000 times.

5. Conclusion and Discussion

As one of the largest agricultural producing province in Turkey, the people depend on the agricultural sectors. Agriculture is generally associated with the countryside. The community income comes from farming activity. In rural areas, most farmers manage the farms with their families. Compared with research results in the study area, the average of household size in another study showed that the farmers were 13.75 people in Nigeria and about 5 people in Konya (Falola et. al., 2013; Tümer et al., 2019). Farm production activities usually depend on family labour. The more family labours were involved in on-farm production, the fewer production costs of farmers. It meant farmers did not have to pay labour wages. The farmers used family labour in farming activities. It showed a high dependence between the economics income of the people and agricultural sectors.

The effect of factors affecting the willingness to take out agricultural insurance as a statistic had been tried to be determined with binary logistics analysis. According to the results of the analysis, age, education, debt amount, land size, sources from which they received information on agricultural insurance, the amount of support paid by the state, pure income and agricultural income, were significantly influenced to the willingness to take out agricultural insurance. In a similar study, a positive relationship between age and willingness to take out insurance was determined in the study conducted in Tokat Province (Tümer, 2011) and Eğirdir District (Ertan and Gök, 2012). However, a negative relationship was found in Nigeria (Falola et. al., 2013). This difference may be due to the characteristics of farmers in each country. In both countries, older farmers are more closed-minded, so they are less open to innovation. The results showed that farmers in Konya were at the end of productive age. At this age, regeneration was needed to continue farming. In addition, regeneration also allows farmers to be more optimal in managing their farming in the future. Education can affect the mindset and absorption of new information. As many as 34.74% of farmers in Konya graduated from junior high school (Tümer et al., 2019) While in Mersin Province, only 12% of farmers graduated from junior high school. The highest percentage (32%) of farmers graduated from a bachelor's degree (Kaplan et. al., 2019). Compared to another study, there were positive relationship between education level and the willingness to have agricultural insurance in Northern Europe (Liesivaara and Myyra, 2014), Kırklareli and Edirne provinces (Aydın et al., 2016) found the same result. Well-trained and educated farmers will be easy to accept the information and innovations that will help them manage agriculture (Falola et. al., 2012).

In another study, it was shown that average farmers' agricultural experience was 21.49 years (Tümer et. al., 2019), 29.88 and 26.32 years (Aydın et. al., 2016). Farmers' experiences are useful at an early stage when adopting certain technologies. Farmers can analyze the benefits of technology, then determine retention attitudes or adopt the technology (Ainembabazi and Mugisha, 2014). Informal education and training provided by the government can improve farmers' skills in carrying out farming activities and making decisions for their farming. According to another study, the average land ownership in Konya was 207.89 da (Tümer et al., 2019). Another study showed that farmers in Edirne had 247.48 da and in Kırklareli had 290.71 da (Aydın et. al., 2016). In the study area, Farmers who carry out agricultural insurance have large land ownerships. Large land ownership has the potential to improve a farmer's welfare. However, the losses caused by risk would be higher, so that farmers carry out agricultural insurance to face risk. The positive relationship between land size and the willingness to have agricultural insurance was determined in a study conducted in Malaysia (Afroz et. al., 2017) and Konya Province (Kızıloğlu, 2017). When the land becomes larger, production costs are higher, so farmers need capital for farming. The capital was obtained from farmers by taking out loan.

The success of production affected the economic stability of the farmer's family. In the study area, for the last 5 years, production risk such as hail, drought and storm caused yield loss between 20–80%. However, the risk did not occur every year. This had been shown with a small percentage of the risk occurring in the past 5 years. Most farmers chose agricultural insurance as a risk management strategy. Agricultural insurance was chosen by farmers in the study area because it will help the farmers when they are facing the risk especially natural risk. But most of them didn't know the benefit of agricultural insurance caused by the lack of information. The low education level of the farmers in the study area could be the cause of the lack of information and technology absorbed by the farmers. In the study area, it has been determined that farmers with a large land area were chosen to take out agricultural insurance. Because, if the size of the land increases, the production cost also increases, and they should not put the product at risk. For this reason, farmers need financing and fulfill their financing needs by credit. Proper risk management is needed to face risk. Farmers spend a lot of expenses on drainage. To deal with drought, the provincial government has developed the "Agricultural Drought Action Plan" and the "Agricultural Crisis Management Plan" managed by province, an organization that focuses on drought management in agriculture (General Directorate of Water Management, 2015). Irrigation management could increase the potential for agricultural production in Konya. Besides, most farmers chose agricultural insurance as a risk management strategy after the risk occurs. In the study area, although the farmers were willing to take out agricultural insurance, it has been determined that the insurance issue was not well understood. When the farmers were dealing

with the risk, the willingness to take out agricultural insurance decreases due to the difficulty of obtaining compensation from the agricultural insurance. Therefore, if the state provides agricultural insurance training within the scope of agricultural extension activities, it may increase the agricultural insurance in the region. In the study area, the insured crops consist of wheat, barley, sunflower, corn, and sugar beet. Insurance costs are calculated per decar according to the type of plant insured. The government of Turkey provides support to farmers with subsidies. Farmers got fertilizer, seed and insurance premium subsidies. According to farmers, the number of subsidies given by the government was insufficient, so they still had to apply for loans for agricultural activities. Providing periodic training and agricultural extension can improve the quality of human resources for farmers. The training provides not only information and technology, but also good agricultural management. The production costs paid by farmers are effective and efficient.

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