MATE

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Possibilities and barriers of development of farmers` cooperation in Kosovo

Doctoral (Ph.D.) dissertation

by

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CONTENTS

I. INTRODUCTION

In the twenty-first century, the world is confronted with a variety of difficulties, many of which are directly connected to agriculture and the food business, and which necessitate answers on a global, regional, national, and local level, as well as at the firm level. Although global population growth is decreasing, certain regions will continue to increase long beyond 2050, maybe even into the next century. Urban areas presently have a higher population density than rural regions, and this disparity is expected to widen as the population expands. By 2050, the world's population is predicted to reach about 10 billion people, expanding agricultural demand by half under a scenario of modest economic development. Agricultural investments and technological breakthroughs are increasing productivity, but yield growth has stalled to levels that are unacceptably low. The degradation of natural resources, on the other hand, is impeding the essential increase in productivity development. Especially, climate change affects disproportionately food- insecure regions, jeopardizing crop and livestock production, fish stocks and fisheries (FAO, 2017). Since the 1990s, global hunger and extreme poverty have decreased. However, today's agrifood systems are unable to keep around 10% of the world's population from becoming hungry. By 2030, the world will not have achieved Zero Hunger. By 2030, the number of people impacted by hunger would have surpassed 840 million if current trends continue. According to data, the world is not moving toward SDG goal 2.1, which calls for ensuring that all people have access to safe, nutritious, and adequate food throughout the year, nor toward SDG target 2.2, which calls for eliminating all kinds of malnutrition (FAO, 2020). Measures to contain the new coronavirus disease (COVID-19) interrupted global and national supply chains, causing economic downturns in several countries, highlighting the fragility of agrifood systems. The loss of buying power damaged billions of people's food security and nutrition, specifically in low-income nations and among the poorest. Restrictions on the movement of persons and products hampered the supply of inputs to farmers and their output to markets, especially in the early stages of the epidemic. Huge amounts of fresh fruits and vegetables were allowed to rot in farmers' fields as harvesting and transportation were halted (FAO, 2021). Low level of cooperation between farmers has been another factor hindering the operation of food systems during the pandemic crisis (DUDEK & ŚPIEWAK, 2022).

Kosovo has a total area of 1.1 million hectares, with agricultural land accounting for 53 percent and forest accounting for 41 percent. Kosovo has a population of 1.8 million people. More than 62 percent of Kosovo's inhabitants live in rural areas. Today in the economy of Kosovo, agriculture continues to play a vital role. It has a positive influence on rural regions' quality of life and long-term development. Agriculture continues to be one of Kosovo's most important economic

sectors in terms of contribution to GDP and employment. It has also traditionally been a source of growth for Kosovo's economy (MESP, 2015). Furthermore, 130,775 agricultural properties occupy 419 thousand hectares (ha) of agricultural land (MAFRD, 2019). The average land area is 3.2 hectares, and it employs 362,700 people, or around 25 percent of the entire population (GJOKAJ ET AL., 2017). According to available data, farmers in Kosovo have one of the lowest rates of poverty (9.4 percent) (WORLD BANK & KAS, 2019). Holders of farm households and individual companies are on average 52 years old. The level of education of holders is relatively low, particularly in agriculture. 28.0 percent have completed only primary school, 5.4 percent did not even meet primary school, while 3.1 percent have no education. Secondary school was completed by almost half of the holders. Less than 3 percent of the holders have completed agriculture studies (Secondary agricultural school, Faculty of Agriculture/Veterinary, Master studies, Ph.D. of farming studies). While 6.7 percent of the holders completed faculty (non-agricultural). Regarding the education/pieces of training in agriculture, more than 95 percent of managers have only practical experience in agriculture (KAS, 2014). There are solely 1250 farms documented on Farm Accounting Data Network (FADN), the average family revenue on a farm is 2,457 €, cooperated to other EU countries is pretty modest (MAFRD, 2019). Due to the low technical efficiency, Kosovo still shares a negative trade balance, taking from the extreme volume of imported goods, and a relatively tiny amount is sold broadly (JUSUFI ET AL., 2015). The non-tradable sectors dominate output and employment in Kosovo. Services represent the most crucial sector in the economy, with a share of value-added at more than 50 percent of GDP in 2019. Farming accounted for 8.7 percent of GDP in 2019. Apart from the advancement in the labor markets over the past decade, only three out of 10 people are employed among the working-age population (WORLD BANK, 2020). The total of imports for agriculture products during 2018 was 712.3 mil. €, most of them come from EU countries, while export was only 63.9 mil. €, more than half of them are exported to CEFTA country members (MAFRD, 2020).

Kosovo is able to have (may) have advantages in different agricultural sectors (fruits and vegetables), yet needs to exceed many challenges and difficulties, mainly due to poor production and competitive capacity (BELUHOVA-UZUNOVA & LUBENIQI, 2019). Farmers could overcome these troubles by operating cooperatively to gain collective power that they do not own separately, and in doing so, they would find a way out of destitution and powerlessness (BIBBY & SHAW, 2005; BIRCHALL & SIMMONS, 2009) and can help alleviate poverty in developing countries (BHUKUTH ET AL., 2018).Agriculture cooperatives are identified as "mutual aid economic organizations" interconnected freely and operated by the farmers and workers of a similar range of farm outputs, or by the providers or users of assistance as the same kind of agricultural production and operation" (WU & DING, 2018). Their primary role is essential in

countries where farms are fragmented over vast and remote rural areas (WANYAMA ET AL., 2009). Kosovo is anticipated to be inthe EU Accession process, implementing the Stabilization and Association Agreement (SAA) in 2016. Types, operation, regulation, and yield of membership of cooperatives in EU countries are well explored. Membership intensity of farming producers in many Northern and Western European countries is over 50 percent, in the Mediterranean and Southern European countries is 30 to 50 percent while this power in Central and Eastern European countries is below 30 percent and even below 10 percent in some cases (GIJSELINCKX & BUSSELS, 2014) resulting from historical background. Some nations still need modifications to boost the effectiveness of agricultural cooperatives (RIBAŠAUSKIENĖ ET AL., 2019). Their categories of information show the possibility of farming cooperatives changing traditional, subsistence agricultural farming to modern market-oriented business units, accelerating growth, and addressing rural poverty can be used in the case of Kosovo.

While in Kosovo, some cooperatives and associations exist in cases of various crops, and in many areas, only around 9.6 percent are considered active, representing only a small percentage of farmers. Types of activities completed by cooperatives are expertise/extension, crop collection/marketing, asset and labor sharing (ALLEN HAMILTON, 2010). Notwithstanding all the advantages, the level of collaboration among farmers (horizontal integration) and between farmers and processors or traders (vertical integration) is yet minimal/ slight in Kosovo. Collaboration among farmers is not actualized due to the lack of solidarity and inadequate governance, making the environment problematic to establish cooperatives in the country efficiently (EFSE, 2013). Despite having a considerable processing ability, most of it remains unused. The challenge for processors is to guarantee both the quantity and quality of local products. Various studies (BELUHOVA-UZUNOVA & LUBENIQI, 2019; GJOKAJ, HALIMI, GJONBALAJ, ET AL., 2017) studying the character and pattern of agriculture in Kosovo advised that land fragmentation and the problems in the land market should be resolved soon, enhance vertical and horizontal coordination, sustain diverse cooperation activities between different types of producers and processors, incorporate in the value chains and enhance marketing channels, develop rural credit accessibility, and obtain better advisory services and training. This circumstance is prevalent in transition countries (BORZAGA & SPEAR, 2004), most nations suffer from a shortage of cooperative entrepreneurship and trust. Nonetheless, this in no way implies that there is no preference for cooperation (e.g., informal collaboration; sharing machinery, labor, etc.) in these countries; the choice for collaboration in transition countries is proximate to that of the other European Countries (LISSOWSKA, 2013). Creating a cooperative can be a big challenge and a very significant achievement. Cooperatives would help farmers in Kosovo to become more competitive and profitable in the market. Nevertheless, it requires a high degree of

trust in the function of the cooperating model, knowledge, research, planning, patience, and dedication. Co-operative development may not come early, as arranged by the founders (PLLASHNIKU, 2015). Regardless, the changing nature of both European and global agricultural markets combined with the fact that sustainability has become an essential issue, gaining more urgency with climate change and scarcity of natural resources, demands a reflection on the current situation in the creation of sustainable agriculture cooperatives in Kosovo.

1.1 Problem statement and justification

Agriculture has traditionally represented a significant role in the economy of Kosovo Farming was the primary financial activity in the country for an extended period, with an inconvenient structure of crops, primitive equipment, and poor performance. Most cereals were cultivated, dedicated to food for the inhabitants and livestock. The livestock was minor, and inferior quality race dominated (REÇICA, 2009). The agriculture sector in Kosovo is represented by small farms, low productivity, low efficiency, poor infrastructure, inappropriate land use, limited land consolidation, and incomplete social land privatization with unclear property and land use rights (MFARD, 2013). Further, Kosovo has unfavorable farm structures, with an average Utilized Agricultural Area (UAA) per holding of 1.5 ha, fragmented into seven parcels. Most crop farms are not acting efficiently despite the considerable potential for technical efficiency advancement (MIFTARI ET AL., 2015). The farm average technical efficiency in transition economies is 86%, whereas in Kosovo is solely 15.7%, demonstrating that an average farmer in Kosovo produces 68.3 fewer percentage points of the possible output than an average farm in transition countries (ALISHANI, 2019). Some of the concerns confronted by Kosovo's farmers are the absence of coordination among small farmers, low level of education and training (KAS, 2014), advisory service, poor knowledge in the usage of technology, high-interest rate on loans (SHKODRA, 2019), unpleasant experience, low technical efficiency, limited market access and trade barriers from neighbor countries, lack of experience, limited market entrance, and the foremost concern is the lack of cooperation between farmers (EFSE, 2013; GJOKAJ ET AL., 2017). While in Kosovo, some cooperatives and associations exist in various crops, and in many areas, only around 9.6% are considered active, representing only a small percentage of farmers.

Although agricultural cooperatives are significant in improving farm efficiency, there is still a dearth of studies on Kosovo agriculture examining their role in economy, potential contribution to welfare of rural area, reduction of poverty and increasing food sufficiency. Studies show that introducing any new technology or operation techniques requires proper knowledge about socio-economic conditions, and natural environment (Abegunde et al., 2020; XIE ET AL.,

2019). A related study in the field raised a fundamental issue in cooperative formation requiring promoters of cooperative societies to pay particular attention to socio-economic characteristics, as they have fundamental effects on the performance of cooperative societies (AGBO & CHIDEBELU, 2010).

1.2 Significance of the study

Nowadays, the agricultural sector plays a fundamental function in providing employment opportunities and generating income for people living in rural areas in Kosovo. Despite the employment creation potential and the significance of the sector, Kosovo farmers face various challenges such as; small farms, poor infrastructure, old technology, high cost of production, low education/training in farming, etc. The imported agricultural products from other countries compete with the local agricultural products making the situation alarming (SALLAHU & GJOKAJ, 2016). Thus, this research focuses on empowering farmers in competitive and profitable markets by improving cooperation among farmers. Furthermore, our study is the pioneering investigation in agriculture cooperation in Kosovo agriculture. Therefore, the importance of this study is as follows:This dissertation is the pioneering research in agriculture cooperation in Kosovo. The first purpose was to examine the socio-demographic and economic factors affecting agriculture cooperation activity and contract farming and their willingness to cooperate and join contract farming. The second purpose was to find the association between socio-demographic, agricultural, and economic factors pertaining to cooperative and non-cooperative farmers and third one to find the main benefits of cooperative farmers and, to identify differences in selling channels between the two groups.

II. OBJECTIVE OF THE STUDY

In correspondence to the previously mentioned problems, the study's overall objective is to estimate cooperation among the farmers in Kosovo that were oriented in general agriculture production.

Within this context, the study aimed to achieve the following specific objectives:

- Specify the level of cooperation activity on agriculture in Kosovo.
- Determine the type of cooperation activity on agriculture in Kosovo.
- Examine the socio-demographic and economic factors on cooperation activity in Kosovo agriculture.
- Research reasons not joining the cooperative.
- Examine trust among farmers.

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- Examine the socio-demographic and economic characteristics of contract farming in Kosovo agriculture.
- Determine socio-demographic, agricultural, and economic factors influencing cooperative and non-cooperative farmers.
- Find out motivations to join the cooperative.
- Study selling channels for cooperative and non-cooperative farmers.

2.1 Research questions and hypothesis

The main research questions for the survey are as follows:
- What are the different types and levels of cooperation existing in the literature, and what are the ones which can be found in the Kosovo`s practice?
- Are there any possibilities to increase the level of cooperation among agricultural producers?
- What are the main reasons why farmers do not cooperate?
- What are the main benefits of farmers that cooperate?
- If the level of trust increases, is the level of willingness to cooperate supposedly expected to increase as well?
- What types and levels of contract farming can be found in Kosovo agriculture?
- What are the differences in socio-demographic, agricultural, and economic factors between cooperative and non-cooperative farmers?
- What are the differences in selling channels using cooperative and non-cooperative farmers?

The researcher developed the following hypotheses, based on the complexity of the study theme and the selected research methods:

H1: Social and economic factors have effect on willingness to cooperate.

H2: Trust has a significant positive effect on willingness of farmers to cooperate.

H3: Social-demographic and economic factors have influence on participation in contract farming.

H4: There are relationship on socio-demographic, agriculture, and economic factors between cooperative and non-cooperative farmers.

H5: There are differences on selling channels between cooperative and non-cooperative farmers.

III. MATERIALS AND METHODS

This chapter gives a detailed account of the materials and methods used to conduct this research. The chapter begins with the description of the study area, questionnaire development, sampling method and size followed by a table consisting of the measurement items used in the questionnaire and a description of the research tool used.

3.1 Study Area

With a surface area of 10,887 km2 and two main regions, the Dukagjini Region in the west and the Kosovo Region in the east (Figure 1), Kosovo is located in the center section of the Balkan Peninsula, between the Mediterranean Sea and the mountainous parts of Southeast Europe. Kosovo shares its southern border with Macedonia, its western border with Albania, its northern border with Montenegro, and its northern and southern borders with Serbia. The continental climate of Kosovo is characterized by temperatures ranging from -20°C in the winter, to +35°C in the summer. Dukagjini region which is ideally suited for labor intensive horticulture, and Kosovo region which is well suited for industrial cereals and potato production. Dukagjini, has fertile arable land with several small rivers which supply with irrigation water and, in combination with the Mediterranean climate, offers great conditions for a diversity of agricultural and livestock activities, and has lower number of 54,249 farmers. While Kosovo region has a slightly higher number of farmers 76,526 which are generally seen with less potential due to inferior climatic conditions, misuse of the agricultural land, or high concentration of activities in urban area (mostly trade and services) (EFSE, 2013).

Figure 1. Map of the study area

The lowest point of altitude is 265 m above the sea level located at "Drini i Bardhë" at the border to Albania and raises up to 2,656 above the sea level which is located in the southern part of Kosovo called Gjeravica. In total, approximately 80 percent of the entire area lies below 1,000 m. On June 2008, the Assembly of Kosovo adopted the Law No.03/L-041 on Administrative Municipal Boundaries and on the basis of this law the country composes of 5 regions, 38 municipalities and 1,469 settlements (KAS, 2014). Kosovo has a population of around 1.8 million people and the youngest population in Europe, with an average age of 25 years (MESP, 2015). Agriculture is the major source of income for more than 62 percent of Kosovo's people who reside in rural regions. Kosovo has a total area of 1.1 million hectares, with agricultural land accounting for 53 percent and forest accounting for 41 percent. According to estimates, 15 percent of the soil is of good grade, 29 percent is of medium quality, and 56 percent is of low quality (DACI-ZEJNULLAHI, 2014). Within agricultural companies and cooperatives, it is estimated that 88 percent of the surface area used for agriculture is private land, while 12 percent is public land (MFARD, 2018).

3.2 Sampling method, size and distribution of questionnaires

Sampling method

The researcher used two sampling methods; Probability sampling method; a sampling method that relies on a random, choice method so that the probability of selection of population elements is known. Nonprobability sampling method; is sampling method in which the probability of selection of population elements are unknown. The researcher used quantitative and qualitative methods of research. Quantitative research includes calculating and measuring happening and conducting the statistical analysis of a group of numerical data (SMITH, 1988). According to SCHUTT & ENGEL (2008), qualitative research often focuses on populations that are hard to locate or very limited in size.

Sample Size

My research field survey consisted of two parts. Between March and April of 2018, I pre-tested my questionnaire with 50 randomly selected farmers in the Dukagjini and Kosovo regions. This pre-test survey assisted me in improving and confirming my questionnaire. After that, between May and October 2018, I conducted a second round of research with 300 farmers in Dukagjini and Kosovo Region and 249 of them answered (Table 1). During the harvest season, the researcher done personal visits to all of the farmers working in the fields. The farmers' willingness to meet and share their ideas with the researcher was the most important criterion in

their selection. Personal interviews, visits to respondents' homes or workplaces, and cooperative associations were used to collect data. Each respondent was given a brief overview of the study's objective before the interview began (for academic research). The questionnaire asked about demographic, social, and economic characteristics that were relevant to the farm profile. The surveys were filled out by hand since farmers lacked understanding on how to use the Internet. The interview lasted an average of 45 minutes, and the questions were asked in non-scientific language so that all farmers, regardless of their level of education, could comprehend them.

Table 1. Sample distribution

Regions	Cities	Sample households
Dukagjini Region	Peje, Prizren, Rahovec,Gjakove, Deçan	124
Kosovo Region	Prishtine, Ferizaj, Gjilan,Mitrovice, Drenas	125

Source: Field survey conduct in Kosovo

The response rate was at 83 percent. We think that it is important to note that the study's sample may be statistically representative at the national level due to the data collection methodologies used. The sample adequacy tests revealed that the study's sample is adequate with a 6.3 percent margin of error at a 95 percent confidence level.

Questionnaire (Primary Data Collection)

This study was based on original data collected from farmers using structured and semi-structured questionnaires as the major data collection instrument. The researcher used random sampling and snowball sampling, in cases when we were not able to identify farmers. In the social and natural sciences, household surveys with a semi-structured questionnaire are a standard method (BARRIBALL & WHILE, 1994). The questions of the questionnaires covered – among others – the following areas: general information about the head of the farm (gender, age, education level, main activity, income dependence on agricultural activity, experience on farming etc.); general information about the farm (scope of activities, size of leased and own land, size of animal stock, etc.); natural indices of farming (production structure, output, asset supply, etc.); contract farming (written contract, verbal contract) and main questions of cooperation with fellow farmers (forms and frequency of cooperation, knowledge about the institutionalized forms of cooperation and the opinion of the farmer about these solutions, etc.); and the question of trust.

The explanation of variables employed in the study are itemized in Table 2.

Table 2. Description of the variables used in the study

Variable	Description	*Binary Logistic Regresion* Measure	*Chi Square* Measure
Dependet Variable			

Cooperation activity	Participation of respodent in cooperation actvity or not	Dummy	
Contract farming	Participation of respondent in contract farming or not	Dummy	
Explanatory variables			
Location	Location of farm	Binary	
Gender	Sex of household head	Binary	Nominal
Age	Age of household head (Years)	Binary	Ordinal
Education level	The respodent education level	Binary	Ordinal
Rent land	Land rented by respodents		Binary
Family involved in agriculture	Family engaged in agriculture		Binary
Seasonal employee	Seasonal employee		Binary
Sharing machineries	Sharing machineries between farmers		Binary
Willignes to buy machinery with others	Redinnes to invest i agriculture machinery with other farmers		Binary
Level of trust	The level of trust among farmers	Ordinal	Ordinal
Type of farming	Types of production of farms	Nominal	Nominal
Size of farm	The size of farm	Ordinal	Ordinal
Income	The income of respodents		Ordinal

Source: Author`s own construction

3.3 Data Analysis

The original data was analyzed using both descriptive and inferential statistical approaches. Statistical Package for the Social Sciences (SPSS) was used to code and analyze the data gathered through surveys. Different statistical methods, approaches and tools will be used and applied for the purpose of testing the study hypotheses and research questions. Binary logistic Regression, Chi Square, Independent sample t-test and other descriptive statistics were performed.

3.3.1 Descriptive Statistics

Descriptive statistics are useful tools in summarizing, organizing and describing the collected data. In the research, descriptive statistics was useful in organizing the data into frequencies and different classes related to the research questions.

3.3.2 Binary logistic regression

Binary logistic regression will be used to check significant economic and demographic/social factors which have influence in cooperation activity of farmers, through this analysis it can be

found the level of cooperation and the willingness of Kosovo`s farmers to cooperate. On the economic factors it will include variables as; type of farming, size of farm, income etc., on the demographic/social factors it will include; location, gender, age, education level and trust of farmers (Figure 2).
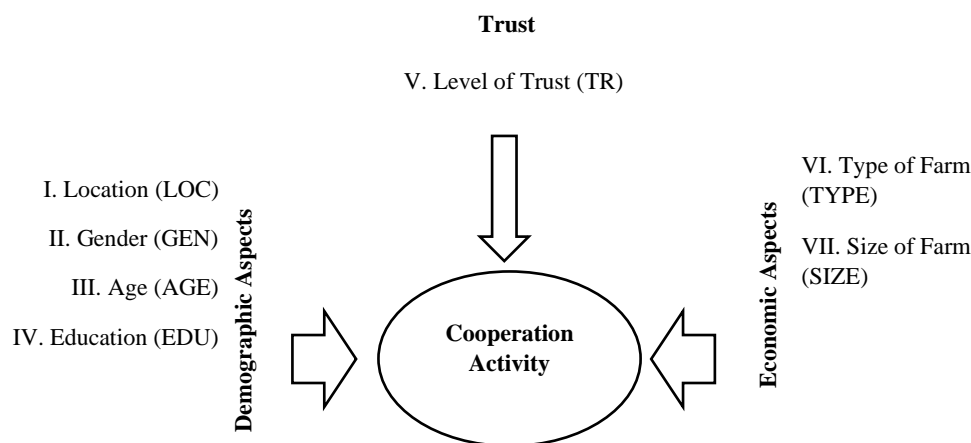
Trust

V. Level of Trust (TR)

I. Location (LOC)

II. Gender (GEN)

III. Age (AGE)

IV. Education (EDU)

Demographic Aspects

VI. Type of Farm (TYPE)

VII. Size of Farm (SIZE)

Economic Aspects

Cooperation Activity

Figure 2. The logical model of the examinations

The same analysis is used before from international researchers like (BARANYAI ET AL., 2018; DAMALAS ET AL., 2019; KONTOGEORGOS ET AL., 2014; STALLMAN & JAMES, 2015; YMERI ET AL., 2020). Through this analysis using the Enter Method will test the three hypotheses. It is important to note that of the 7 variables included on the model, I.-IV. and VI.-VII. were used as categorical variables, and the last category was maked as a reference value in most of cases. Binary logistic regression sometimes is called the logistic model or logit model, it analyzes the association among multiple independent variables and a categorical dependent variable, and estimates the likelihood of occurrence of an event by suitable data to a logistic curve (PARK, 2013). The most essential data acquired for the study is binary values (FIELD, 2009; GUJARATI, 2006).

The factors (X–independent variables) impacting agriculture cooperative activity, as well as the outcomes (Y–dependent variables), might be examined using this Model. The following regression model:

$$Yi = β1 + β2Xi + ui \ (1)$$

Model (1) seems like a typical linear regression model but because the regression is binary, or dichotomous, it is named a linear probability model (LPM)(GUJARATI, 2006).

The formula will be for the analysis is as follows:

$$Y = β0 + β1 \text{ LOCATION} + β2 \text{ GENDER} + β3 \text{ AGE} + β4 \text{ EDUCATION LEVEL} + β5 \text{ TRUST}$$
$$+ β6 \text{ TYPE OF FARMING} + β7 \text{ SIZE FARM} + ui \text{ (1)}$$

With the same analysis (Binary logistic regression) was used to examine socio-demographic and economic factors which have influence to join contract farming, through this analysis it can be found the level contract farming and the willingness of Kosovo`s farmers to join on contract farming. On the socio-demographic factors include; cooperation, gender, age, education level and experience of farming, while on the economic factors include variables as; type of farming, type of farming (Figure 3).

Trust

VI. Level of Trust (TR)

I. Location (LOC)

II. Gender (GEN)

III. Age (AGE)

IV. Education (EDU)

V.Cooperation (COOP)

Socio-Demographic Aspects

VII. Type of Farm (TYPE)

VIII. Size of Farm (SIZE)

Economic Aspects
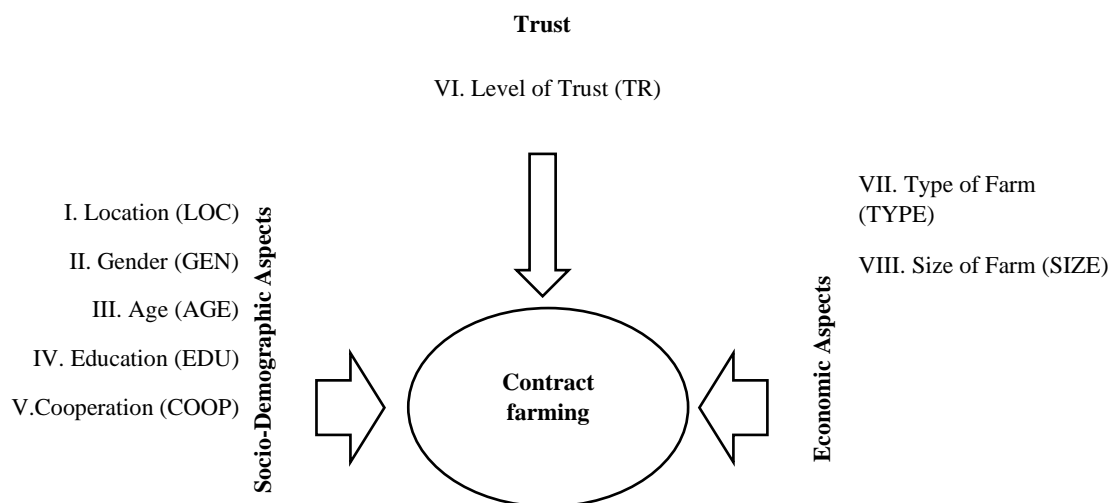
Contract farming

Figure 3. The logical model of the examinations

The variables (X–independent variables) impacting contract farming in agriculture, as well as the outcomes (Y–dependent variables), might be measured using this Model. The regression model is as follows:

$$Yi = β1 + β2Xi + ui \text{ (1)}$$

The formula for the analysis is as follows:

$$Y = β0 + β1 \text{ LOCATION} + β2 \text{ GENDER} + β3 \text{ AGE} + β4 \text{ EDUCATION LEVEL}$$
$$+ β5 \text{ COOPERATION ACTIVITY} + β6 \text{ TRUST} + β7 \text{ TYPE OF FARMING}$$
$$+ β8 \text{ SIZE FARM} + ui \text{ (1)}$$

When using logistic regression models, ILDIKÓ & SZÉKELYI (2004) point out that if a model has too many independent variables, the total R-squared value would be inflated. To avoid this, they suggest measuring explanatory power using the following formula:

$$R_{LA}^2 = \sqrt{\frac{G_M - 2k}{D_0}} \quad \text{where,}$$

GM is deviation chi-square, k denotes the number of independent variables in the model;

$$D_0 = -2\left\{(n_{Y=1})\ln\left[P(Y=1\right] + (n_{Y=0})\ln\left[P(Y=0\right]\right\} \text{ and,}$$

in which nY=1 denoting the frequency of the occurrence of cooperation as an event; P(Y = 1) means the probability of the occurrence of the same event; nY=0 and P(Y = 0) marks the frequency and probability of the non-occurrence of cooperation. The value obtained is also in the range from 0 to 1, with 0 indicating that the independent variables included to the model do not contribute to the prediction of the dependent variable's value, and 1 representing a clear determination.

2.3.3 Chi-Square

The independence chi-square test, also known as Pearson's chi-square test or the chi-square test, is a statistical test evaluating association between two categorical variables (UGONI & WALKER, 1995). The link between cooperative and non-cooperative farmers in relation to the variables under research was discovered using descriptive statistics and a Chi Square test, with Cramer's V indicating the relationship's power. The Chi Square (X2) test, which was invented by K. Pearson, is one of the tools that may be used to analyze information about data relationships (PEARSON, 1900). Cramer's V, on the other hand, is a post-test technique (with values ranging from 0–1) used after Chi-square to determine the strength of an association with the following interpretation: "very weak" is considered 0–0.19, "weak" 0.2–0.39, "moderate" 0.40–0.59, "strong" 0.6–0.79, and "very strong" 0.8–1 (SIMAR & WILSON, 2015).

2.3.4 Independent Sample t test

The Independent Samples t-Test is a statistical test that analyzes the means of two independent groups to see if there is statistical evidence that the related population means differ significantly. To test the hypothesis, the researcher used the Independent Sample *t*-test in some cases such as; to comapre the climatic factors in Dukagjini Region and Kosovo Region, if there are significant differences between these two regions. The variables that are included was the maximal temperature, the minimal temperature, the average temperature (in ∘C) and the rainfall (in mm) fom year 2017 until 2020. Then versus compare the revenue of farmers who collaborate (who are members of any cooperatives) to farmers who do not. Similar research may be found in the study of JUYJAENG & SUWANMANEEPONG (2017). The variables that will be included was the total income from the main activity of the farmers. The difference between the two farmer groups

was determined using an independent sample t-test. Independent Sample T-test was used to determine the contrast in the sales channels of products between cooperative and non-cooperative farmers. An Independent Sample t-test can be used to compare the mean of one sample with the other to test the statistically significant difference between the two samples (KULKARNI, 2016). In addition, effect size was applied as a complementary statistic to validate the independent t-test (DANKEL ET AL., 2017). Effect size an effect statistic which is used to measure the difference between two group means (LAKENS, 2013). According to SULLIVAN & FEINN (2012) while reporting and interpreting results, both the substantive significance (effect size) and statistical significance (*P* value) are required to be reported. Cohen's *d* was adopted and computed as follows:

$$\text{Cohen's } d = \frac{\text{M } coop - \text{M } non-coop}{\text{SD} pooled} \quad (1)$$

Where; Cohen's d = effect size; M $coop$ = cooperative farmers group mean; M $non\text{-}coop$ = cooperative farmers group mean; SD $pooled$ was computed as:

$$SD_{pooled} = \sqrt{\frac{SD_{coop}^2 + SD_{non-coop}^2}{2}} \quad (2)$$

Where: SD^2 *coop* = squared standard deviation of the cooperative farmers group; SD^2 *non-coop* = squared standard deviation of the non-cooperative farmers group. For interpretation purposes, *d* < 0.50 indicated small effect size; 0.50 ≥ *d* < 0.80 indicated moderate effect size and 0.80 ≥ d reflected large effect size (JACOB, 1977).

III. RESULTS AND DISCUSSION

3.1 Descriptive analysis of temperature and rainfall in Kosovo

According to the measurements of Hydrometeorological Institute of Kosovo done from 2017-2020, (Figure 4) showed that in Dukagjini Region the maximal temperature 19.14 ℃ and average temperature 13.83 ℃ is obtained in 2019. While 2017 is characterized by lower max. temperatures compared to 2018, 2019 and 2020.

Figure 4. Descriptive statistics for year average temperature from 2017 to 2020 in Kosovo Region (unit: ◦C)

Source: Author`s own construction based on statistic information

As presented in the Figure (5), in Kosovo Region the maximal temperature 18.26 ℃ and average temperature 11.77 ℃ is obtained in 2019. While in 2017, 2018 the maximal temperature was slightly lower. Based on the data of two regions year 2019 was characterized with the high temperature.
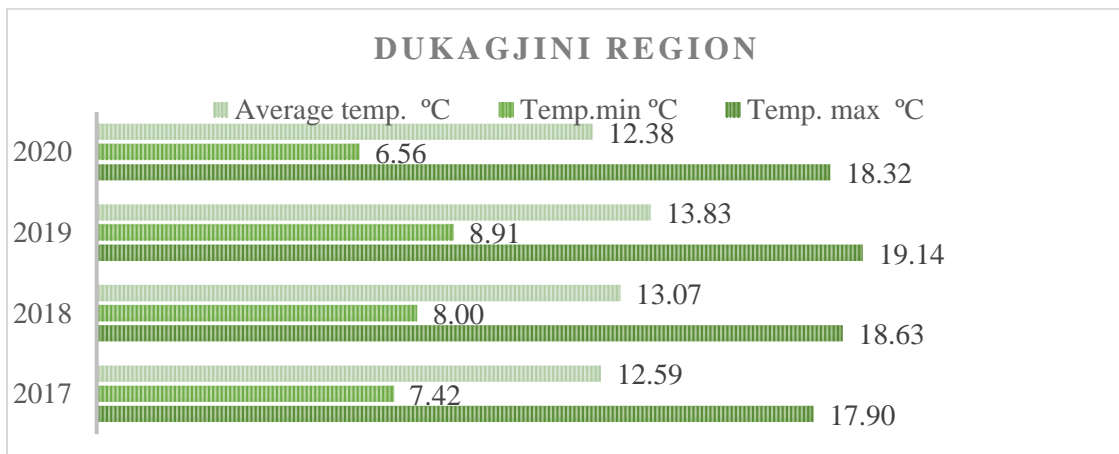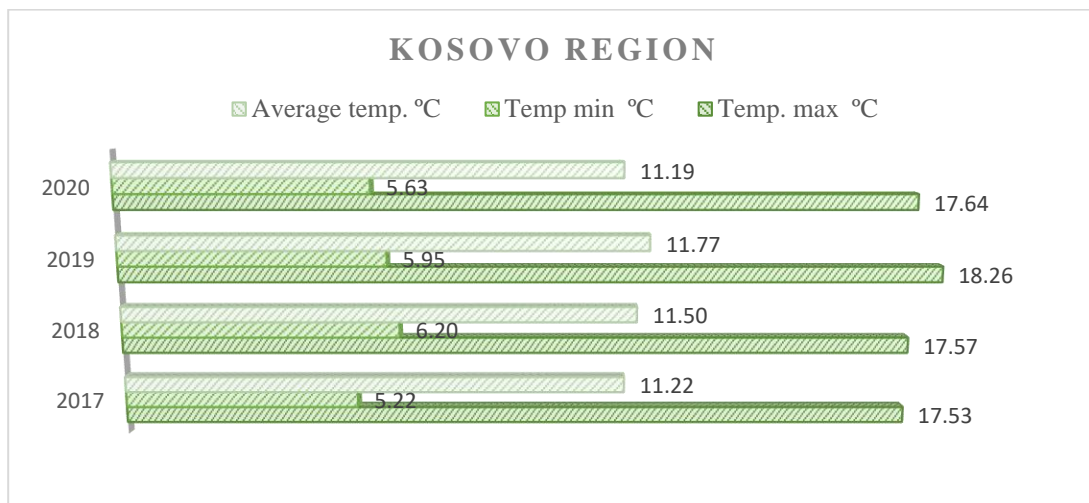

Figure 5. Descriptive statistics for year average temperature from 2017 to 2020 in Kosovo Region (unit: ◦C)

Source: Author`s own construction based on statistic information

As indicated on the figure (6) the precipitation in Kosovo Region and Dukagjini region was minor especially in 2017 in 57.44(mm) and 57.49(mm). While in the next year 2018 it was slightly increasing in both regions (68.66 and 68.09 mm). Taking into consideration that 2019 was characterized with the high level of precipitation in Dukagjini Region 73.09(mm) while in the same year in Kosovo Region it was seen the lowest level of precipitation 49.19(mm). While in 2020 it was seen almost the same average rainfall in both regions (59.27; 60.21mm).
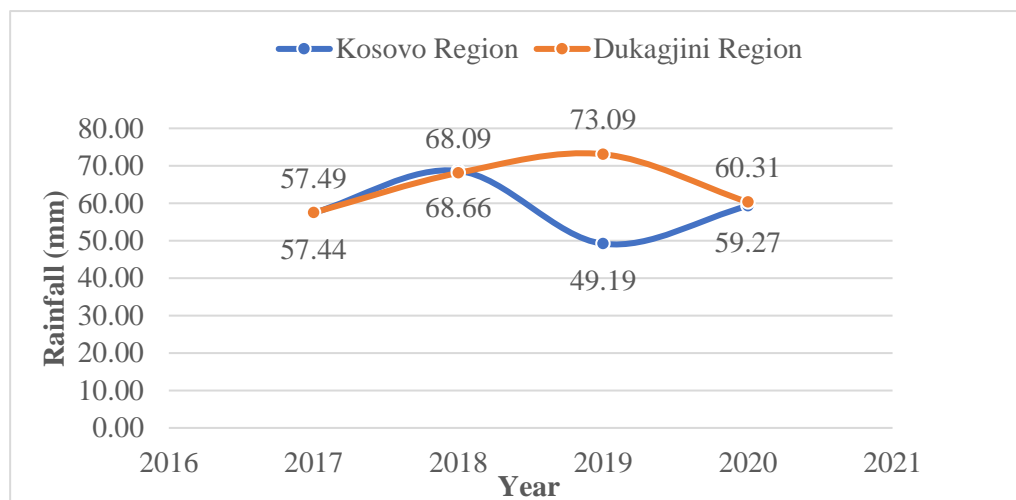

Figure 6. Descriptive statistics for year average rainfall from 2017 to 2020 in Kosovo Region

Source: Author's own construction based on statistic information

An independent Sample t Test was used to identify significant difference in maximal, minimal and average temperature and the rainfall between Dukagjini Region and Kosovo Region (Table 3). The results showed that there is not a significant difference in maximal temperature (M $D.R$=18.46, M $K.R$=17.78, t=-0.540, p> 0.590, d=0.10), minimal temperature (M $D.R$=7.54, M $K.R$=5.75, t=-.1.81, p> 0.70, d=0.26), and average temperature (M $D.R$=15.02, M $K.R$=11.41, t=-1.501, p> 0.135, d=0.21) between the Dukagjini Region and Kosovo Region. The results also stress that there is not a significant difference in terms of rainfall (M $D.R$=64.34, M $K.R$=59.44, t=-0.735, p> 0.463, d=0.10) between two regions. The temperature measurements in the two regions can not be compleately independent, since they are located close to each other thus they probably have a similar climate-weather.

Table 3. Comparison of maximal, minimal and average temperature and rainfall between Dukagjini and Kosovo Region (2017-2020)

Temperature ◦C	Dukagjini Region	Kosovo Region				
	Mean	*Mean*	*Mean Difference*	*t-value*	*p-value*	*d-value**
Max. temperature	18.46	17.78	-0.684	-0.540	0.590	0.10
Min. temperature	7.54	5.75	0.984	-1.81	0.70	0.26
Average temperature	15.02	11.41	-3.61	-1.501	0.135	0.21

| Rainfall | 64.34 | 59.44 | -4.89 | -0.735 | 0.463 | 0.10 |

<div align="center">* Cohen's d</div>

<div align="center">Source: Author's own construction based on statistic information</div>

3.2 Farmers' willingness to collaborate in Kosovo agriculture

In the literature, research on agricultural cooperative activities is rather sparse, particularly in Kosovo. As a result, the findings of this study are significant for better understanding the demographic and economic determinants of farmer cooperation. Concerning the demographic and economic characteristics of cooperative activity, the findings (Table 4) revealed that more than three-quarters (73.3 percent) of the farmers in the sample were from rural and minor regions, whereas (27.7 percent) were from urban areas. The majority of farms (94.4 percent) were handled by men, while the rest (5.6 percent) were managed by women. The respondents' average age was 46.99. More than half (58.6 percent) are between the ages of 15 and 49, with the rest (41.4 percent) between the ages of 50 and 80. More than three–quarters of farmers (79.5 percent) had completed primary/secondary school, while the rest had completed university (20.5 percent). Moreover, the findings of the sample revealed that the majority of the farms (48.2 percent) were part of mixed farms (which included animal farms and fruits), while others (37.3 percent) were vegetable farms and cereal farms (14.5 percent). While the average farm size was 6.81 ha, the majority of farmers (85.6 percent) belonged to the long scale farms 0.01 to 10.00 ha, while a minority (14 percent) belonged to the size 10.01 to 70.00 ha. Per the degree of trust, the majority of respondents (65.5 percent) believe in farmer cooperation, a minority (19.2 percent) do not, and the remaining (15.3 percent) do not agree or disagree.

Table 4. Farmers' basic characteristics on willingness to cooperate

Factor	Category	Frecuency	Perc. %	Mean & S.D *
I. Location	Urban	69	27.7%	0.09 ± 0.284
	Rural	180	73.3%	0.22 ± 0.413
II. Gender	Male	235	94.4%	0.17 ± 0.337
	Female	14	5.6%	0.36 ± 0.497
III. Age	14–49	146	58.6%	0.27 ± 0.444
	50–80	103	41.4%	0.06 ± 0.235
IV. Education Level	University	51	20.5%	0.31 ± 0.469
	Primary/higher school	198	79.5%	0.15 ± 0.354
V. Type of Farming	Cereals	36	14.5%	0.11 ± 0.319
	Vegetable	93	37.3%	0.19 ± 0.397
	Mix farms	120	48.2%	0.19 ± 0.395
VI. Size Farm	0.01–5	162	65.1%	0.07 ± 0.252
	5.01–10	51	20.5%	0.57 ± 0.500
	10.01–20	24	9.6%	0.17 ± 0.381
	20.01–70	12	4.8%	0.08 ± 0.289
VII. Trust	Likert scale (1–5) 1.I don't agree at all	24	9.6%	0.04 ± 0.204
	2. I don't agree	24	9.6%	0.08 ± 0.282
	3. I don't agree or disagree	38	15.3%	0.08 ± 0.273

	4. I agree			
	5. I agree at all	117	47.0%	0.08 ± 0.293
		46	18.5%	0.61 ± 0.493

*Mean & Standard Deviation: 0 for those who do not cooperate 1 for those who cooperate

Source: Author's own work based on SPSS 21 Results

Despite the high degree of trust among farmers, just a slight number of the sample's farmers (18.1 percent) are collaborating farmers, and the vast majority of farmers (81.9 percent) do not collaborate at all (Figure 7). According to our findings, collaboration in Kosovo appears to be low (18.1 percent), which is consistent with the findings of a previous survey done in 2013 (MIFTARI ET AL., 2015), which showed little or no change in the situation over the preceding five years. It was surprising to see nearly identical findings in the case of Hungarian farmers as well (BARANYAI ET AL., 2011).
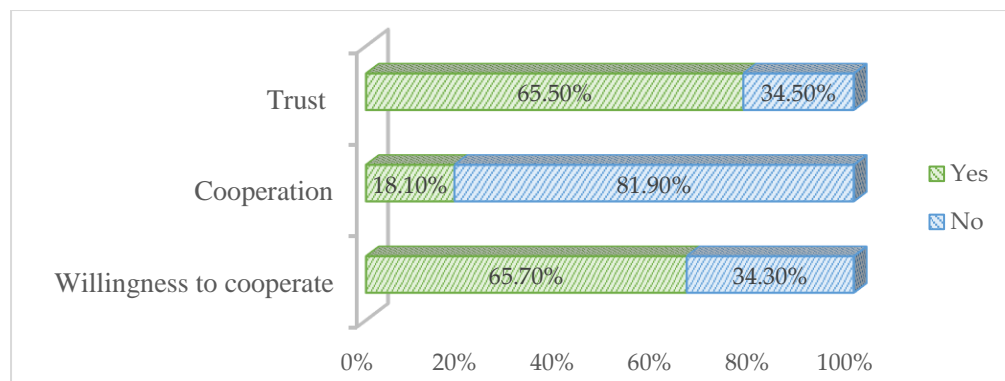

Figure 7. Agriculture cooperation, willingness to cooperate and trust
Source: Author's own work based on SPSS 21 Results

However, according to survey results, more than half of farmers (65.7 percent) are eager to join or engage in any collaboration (particularly buying/sharing agricultural machinery among themselves) (with their relatives, friends, neighbors). It is because farmers have a high level of trust (65.5 percent) (Figure 7). Farmers in Kosovo appear to have a higher degree of trust and readiness to collaborate, yet collaboration is extremely low, given that farmers have not showed willingness to engage at a higher level, such as with the cooperative institution, but only in informal cooperation. Several of the primary reasons offered to understand why farmers were not a part of any cooperative including: they do not feel that cooperative can benefit them (46.3 percent) ("I do not believe that the cooperative institution can help me"). They disagree with cooperative work (31.1 percent) ("I disagree with how the organizations are organized"), and they want to be autonomous (11.3 percent) ("I want to make my own decisions and not rely on others").Other reasons were that they do not trust other farmers (6.2 percent)("I do not trust others to decide for me"), they buy the inputs from the same supplier who suggest them for different issue

(5.8 percent) ("I buy my supplies (fertilizers, pesticides) from a particular supplier who also advises me") (Table 5).

Table 5. Reasons for not participating in the agricultural cooperative

Reasons	Percentage
I sell my products to the same trader/company for many years, and I am satisfied.	3.9%
I buy my supplies (fertilizers, pesticides) from a particular supplier who also advises me.	5.8%
I do not believe that a cooperative institution could help me.	46.3%
I do not agree with the way the cooperatives are running.	31.1%
I want to make up my own decisions and not to depend on others.	11.3%
I do not trust others to decide for me.	6.2%
I have personal differences/disagreements with some other members of the cooperative.	0.8%
I have personal differences/conflicts with the administrative board of the cooperative.	–
The cooperative cannot provide useful services to me.	1.6%
The cooperatives cannot solve producers' problems (only the state can).	3.5%
Other reasons	5.1%

Source: Author's own work based on SPSS 21 Results

According to the study's findings (Figure 8), the majority of farmers (76.30 percent) said they coordinate sales with other farmers, and the majority of farmers (78.70 percent) said they organize raw material purchases with other farmers. In terms of cooperative usage of agricultural machinery, more than half of the farmers (58.50 percent) answered that they do not utilize these machines with other farmers.
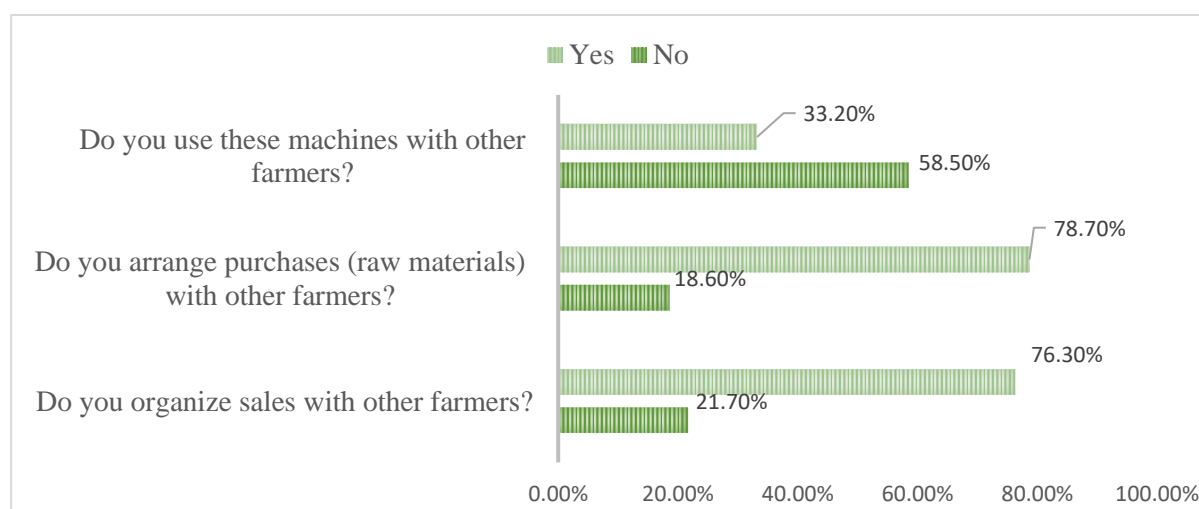

Figure 8. Please let me know if you agree or disagree with the following statements
Source: Author's own work based on SPSS 21 Results

However, the results (Figure 9) appear to be quite hopeful, since more than half of the farmers (66.20 percent) are eager to purchase various agricultural equipment to share with other farmers.
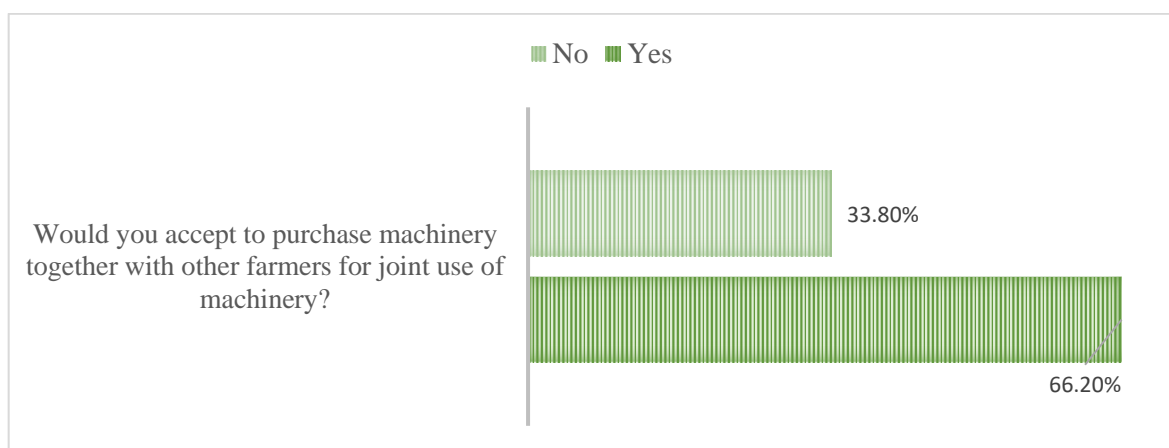
Figure 9. If you have the chance, would you accept to purchase machinery together with other farmers for joint use of machinery?

Source: Author's own work based on SPSS 21 Results

Table 6 depicts the utilization of agricultural machinery by cooperative and non-cooperative farmers. Farmers from both categories report that they own a tractor (Coop 1.27 ± 0.447 ; Non coop 1.21 ± 0.405), plowing machinery (Coop 1.47 ± 0.505 ; Non coop 1.40 ± 0.492), a truck(Coop 1.60 ± 0.495 ; Non coop 1.58 ± 0.495), spraying equipment (Coop 1.27 ± 0.447 ; Non coop 1.47 ± 0.500), and irrigation equipment (Coop 1.27 ± 0.447 ; Non coop 1.50 ± 0.501). While both organizations claim to lack harvesting machinery (Coop 1.80 ± 0.405 ; Non coop 1.85 ± 0.360) and a storage environment (Coop 1.73 ± 0.447 ; Non coop 1.88 ± 0.329).

Table 6. Ownership of agricultural machinery between cooperative and non-cooperative farmers

Sort	Answer	Pulled data N=249 Frequency & Percentage	Coop. farmers N=45	Mean & S.D.*	Non-coop. farmers N=204	Mean & S.D.*
Tractor	Yes	195(78.31%)	33(73.30%)	1.27 ± 0.447	162(79.4%)	1.21 ± 0.405
	No	54(21.69%)	12(26.70%)		42(20.6%)	
Plowing machinery	Yes	146(58.80%)	24(53.30%)	1.47 ± 0.505	122(59.80%)	1.40 ± 0.492
	No	103(41.20%)	21(46.70%)		82(40.20%)	
Planter machine	Yes	134(53.80%)	23(51.00%)	1.49 ± 0.506	111(54.40%)	1.46 ± 0.499
	No	115(46.20%)	22(49.00%)		93(45.60%)	
Harvester machine	Yes	40(16.00%)	09(20.00%)	1.80 ± 0.405	31(15.20%)	1.85 ± 0.360
	No	209(84.00%)	36(80.00%)		173(84.80%)	
Combine	Yes	15(6.00%)	01(2.30%)	1.98 ± 0.149	14(6.90%)	1.93 ± 0.253
	No	234(94.00%)	44(97.70%)		190(93.10%)	
Truck	Yes	104(41.80%)	18(40.00%)	1.60 ± 0.495	86(42.15%)	1.58 ± 0.495
	No	145(58.20%)	27(60.00%)		118(57.85%)	
Goldor	Yes	105(4.40%)	02(4.44%)	1.96 ± 0.208	103(50.50%)	1.96 ± 0.206
	No	144(95.60%)	43(95.56%)		101(49.50%)	
Irrigation equipment	Yes	136(54.60%)	33(73.30%)	1.27 ± 0.447	103(50.50%)	1.50 ± 0.501
	No	113(45.40%)	12(26.70%)		101(49.50%)	
Spraying equipment	Yes	142(57.00%)	33(73.30%)	1.27 ± 0.447	109(53.43%)	1.47 ± 0.500
	No	107(43.00%)	12(26.70%)		95(46.56%)	

| Storage environment | Yes No | 37(14.90%) 212(85.10%) | 12(26.70%) 33(73.30%) | 1.73±0.447 | 25(12.30%) 179(87.70%) | 1.88±0.329 |

*Mean & Standard Deviation: 1 for those who own agriculture machinery and 2 for those who do not own the agriculture machinery

Source: Author's own work based on SPSS 21 Results

The sole difference is that cooperative farmers report that they do not possess goldor (Coop 1.96±0.208) and planter machines (Coop 1.49±0.506), but non cooperative farmers do (Non coop 1.46±0.499; Non coop 1.96±0.206). According to the farm's manager, "nearly all of the argiculture machinery is quite outdated, which results in high maintenance costs and negative environmental implications." According to the study's findings (Figure 10), farmers who are not members of agricultural cooperatives agree with the statement that sharing agricultural machinery with other farmers is financially viable (14.70 percent), and the same group of farmers agree that sales with other output farmers are inexpensive (13.70 percent). While cooperative farmers (95.60 percent) agreed that purchases of other inputs are affordable, non-cooperative farmers did not (71.60 percent).
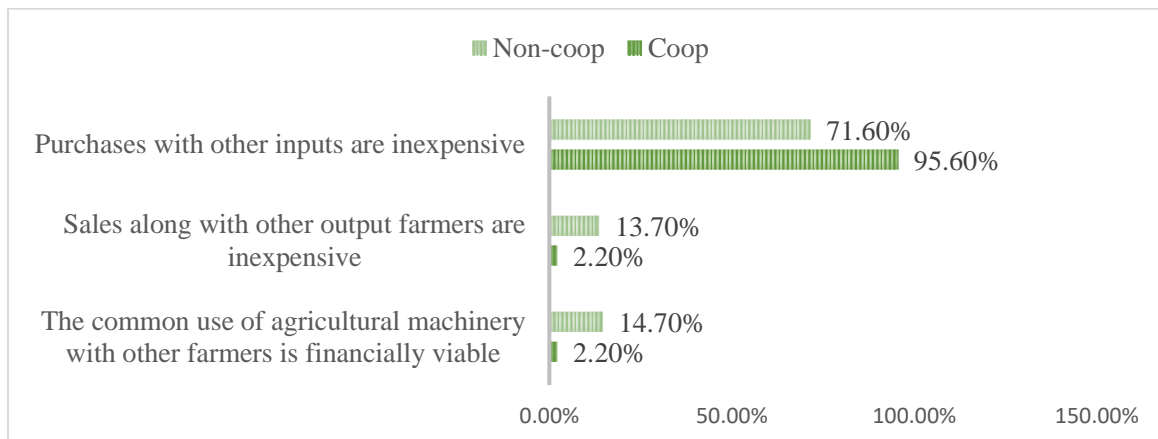
Figure 10. Would you accept to purchase machinery together with other farmers for joint use of machinery?
Source: Author's own work based on SPSS 21 Results

The logistic regression model produced a statistically significant result of $\chi^2(9) = 104.60$, $p < 0.001$ for the logistic regression model. This model successfully identified 91.2 percent of the cases and explained between (Cox & Snell R Square) 34 percent and (Nagelkerke R2) 56 percent of the variation in collaboration activity. Furthermore, the Goodness–of–fit test (Hosmer and Lemeshow) yielded negligible results: $\chi^2(8) = 8.487$, $p > 0.387$. The logistic regression result of the parameters affecting farmer cooperation activities in Kosovo is shown in table (18) below.

The outcome revealed that the Predicted logit of (COOPERATION) = –7.570+ (1.333) *LOCATION + (–1.504) *GENDER + (1.400) *AGE + (–1.307) *EDUCATION LEVEL +

$$(1.210) \text{ *TRUST} + (0.185) \text{ *TYPE OF FARMING} + (0.036) \text{ *SIZE OF FARM(1)} + (2.805)$$
$$\text{*SIZE OF FARM(2)} + (0.484) \text{ *SIZE OF FARM(3)}.$$

Location, gender, age, education level, trust, and farm size were all significant predictors of collaboration activity in binary logistic regression (Table 7). The type of farming was not statistically significant ($p > 0.580$). (I) Furthermore, there is a positive significant ($p < 0.05$) association between location and collaboration activity. Furthermore, collaboration was less widespread on farms in urban regions than on farms in rural areas, and rural farmers had a stronger desire to collaborate than urban farmers. As a result, the number of farms in rural regions grows; the odds ratio of cooperation activity increases 3.793 times more than in urban areas; the explanation for this might be because farmers in rural areas are actively involved in agricultural activities and have limited options other than farming. The differences between urban and rural regions are reflected in the average number of farmers collaborating in rural areas (Table 7), which is larger (0.22 ± 0.413) than in urban areas (0.09 ± 0.284). (II) The second demographic element evaluated in the study is gender, which plays a significant but negative influence in collaboration activity ($p < 0.05$) Farms managed by males have a reduced likelihood of cooperating, but farms managed by females are 4.504 (1/0.222) times more likely to collaborate. Different results can be found in the study of (BARANYAI ET AL., 2018). The causes for this might be linked to the fact that women are underrepresented in political and economic decision–making processes; they also do not have access to quality, fair–wage, and safe job opportunities, and are more likely to work as unpaid laborers (COPAC COOP, 2015). Over the last two decades, women have been more involved in cooperatives. SUZUKI (2010) found that the majority of members in consumer cooperatives are women, indicating a substantial female presence in worker cooperatives. Female-led farms are more likely to collaborate (0.36 ± 0.497), compared to males (0.17 ± 0.337). (III) The age of farmers is another predictor that has a favorable effect on cooperative activities ($p < 0.05$). Farmers who are younger (group 1), 15–49 years old, are 4.054 times more likely to collaborate than farmers who are older (group 2), 50–80 years old. A rise in the number of young farmers is linked to improved collaboration among them. The same findings were obtained in a study of BARANYAI ET AL., (2018). This might be due to the fact that elderly farmers prefer to work with their own family members rather than with strangers, and they have extensive knowledge of numerous farming techniques. The younger generation (group 1) has a greater average of cooperating farmers (0.27 ± 0.444), whereas the elder generation (group 2) has a lower average (0.06 ± 0.235). (IV) Cooperation activity shows a substantial negative connection ($p < 0.05$) with education level. Higher number of farmers with a low level of education would correspond with lower odds of cooperation, whereas farmers who have a high level of education are 3.690 (1/0.271) times more likely to cooperate. The same findings were obtained in a study of

BARANYAI ET AL. (2018); KARLI ET AL., (2006); KŐSZEGI (2016). It may also be noticed in the variation in mean across groups; 1 (university) which cooperate is greater (0.31 ± 0.469), compared group 2 (primary/higher school) (0.15 ± 0.354). (V) It was also shown that the degree of trust and collaboration activity had a positive correlation (p < 0.01). A higher level of trust is associated with a higher chance of collaboration. (VI) And according to findings of economic considerations, the type of farming has no impact on cooperation activity (p > 0.05). (VII) The size of farms was the final factor to consider, and it had a favorable impact (p < 0.01) in cooperation activity, medium–sized farms 5.01–10.00 ha are more likely to cooperate 16.522 times greater, compared to small–sized farms; 0.01–5.00 ha. The same results can be found in the study of KARLI ET AL., (2006). This difference is also stressed by means of size farm group (1) (0.07 ± 0.252), group (2) (0.57 ± 0.500), group (3) (0.17 ± 0.381), and group (4)(0.08 ± 0.289).

Except for the type of farming (p > 0.05) , all other variables had an influence on cooperative activity, as shown in Table 18. All six factors in the model have an influence on collaboration activity, which can be statistically supported (p < 0.05).

According to the value of R^1, the size of farm (SIZE) has the greatest influence (0.316), followed by the degree of trust (TR; 0.250) and the partial impact (0.125) of education level (EDU) and of age (0.124)(AGE).

Table7. Factors affecting cooperation activity

FACTORS	B	S.E	Wald	Df	p-value	Exp(B)	R
I. LOC (Urban) Rural	1.333	0.589	5.118	1	0.024	3.793	0.113
II. GEN(Female) Male	−1.504	0.744	4.091	1	0.043	0.222	0.093
III. AGE (50-80) 14-49	1.400	0.584	5.741	1	0.017	4.054	0.124
IV.EDU(University) Primary/higher school	−1.307	0.545	5.754	1	0.016	0.271	0.125
V. TR	1.210	0.293	17.045	1	0.000	3.353	0.250
VI. TYPE	-	-	-	-	0.580	-	–
VII.SIZE(0.01-5.00)			30.103	3	0.000	0	0.316
5.01-10	0.036	1.230	0.001	1	0.977	1.036	0.116
10.01-20	2.805	1.226	5.232	1	0.022	16.522	-
20.01-70	0.484	1.306	0.138	1	0.711	1.623	-
Constant	−7.570	2.379	10.127	1	0.001	0.001	

–2 Log likelihood = 130.70; Hosmer and Lemeshov test (X2 = 8.48, df = 8, p = 0.387); Pseudo R–squares (Cox and Snell R2 = 34 %; Nagelkerke R2 = 56%); Overall percentage of correctly

[1] Papers on methodology recommend the use of the so-called R value to express the role and power of specific independent variables in a model. The size of the value denotes the order of „importance" of independent variables. This index is not a part of the output of the model, it needs to be calculated using the following equation: $R = \sqrt{\dfrac{Wald - 2df}{D_0}}$.

predicted = 91.2%; B: unstandardized regression weight; S.E.: standard error; Sig.: significance; Exp(B): exponentiation of the B coefficient; Wald.: Wald chi-square value; Df.: the degrees of freedom. ("-" Factors that were not shaped in cooperation activity)
Source: Author's own work based on SPSS 21 Results

3.3 Factors Influencing the Willingness to Participate in Contract Farming in Kosovo

In terms of socioeconomic characteristics influencing the desire to join contract farming, the results (Table 8) revealed that more than three-quarters of the farmers in the sample (73.3 percent) were from rural and minor regions, while 27.7 percent came from urban areas. Males manage the majority of the farms (94.4 percent), while females manage a minority of the farms (5.6 percent). In terms of age, 58. percent of the farmers were between the ages of 14 and 49, while the rest were over 50. Over three-quarters of farmers had completed secondary education, with the remainder having completed university. When questioned about their faith in farmer cooperation, the majority of respondents (65.5 percent) do, a small percentage (19.2 percent) do not, and the rest (15.3 percent) do not agree or disagree.

Table 8. Farmers' basic characteristics on participation in Contract Farming

Factor	Category	Frecuency	Perc. %
I. Location	Urban Rural	69 180	27.7% 73.3%
II. Gender	Male Female	235 14	94.4% 5.6%
III. Age	14–49 50–80	146 103	58.6% 41.4%
IV. Education Level	University Primary/higher school	51 198	20.5% 79.5%
V. Trust	Likert scale (1–5) 1.I don't agree at all 2 I don't agree 3I don't agree or disagree 4 I agree 5 I agree at all	24 24 38 117 46	9.6% 9.6% 15.3% 47.0% 18.5%
VI. Cooperation activity	Yes No	45 204	18.1% 81.9%
VII. Type of Farming	Cereals Vegetable Mix farms	36 93 120	14.5% 37.3% 48.2%
VIII. Size Farm	0.01–5 5.01–10 10.01–20 20.01–70	162 51 24 12	65.1% 20.5% 9.6% 4.8%

Source: Author's own work based on SPSS 21 Results

When farmers were asked if they cooperate (in a formal or informal form) among themselves, the majority (81.9 percent) indicated they do not cooperate in any way, while the rest said the contrary. Nearly half of the farmers in the survey (48.2 percent) have mixed farms, while the rest have

vegetable (37.3 percent) and cereal (37.3 percent) farms (14.5 percent). In terms of land area, the majority of wheat farmers (85.6 percent) had small farms of 0.01–10 ha, whereas a minority (14.4 percent) had farms of 10-70 ha. In Kosovo, the overall level of contract farming appears to be low. Contract farming was divided into two categories based on farmer responses: non-contract farming and contract farming. The majority of the farmers in the survey (56.2 percent) said they practice contract farming, while the rest (43.80 percent) said they do not (Figure 11). According to the farm leader, they wish to perform contract farming for those items that are shipped outside of Kosovo because the contract is fully completed in these circumstances.
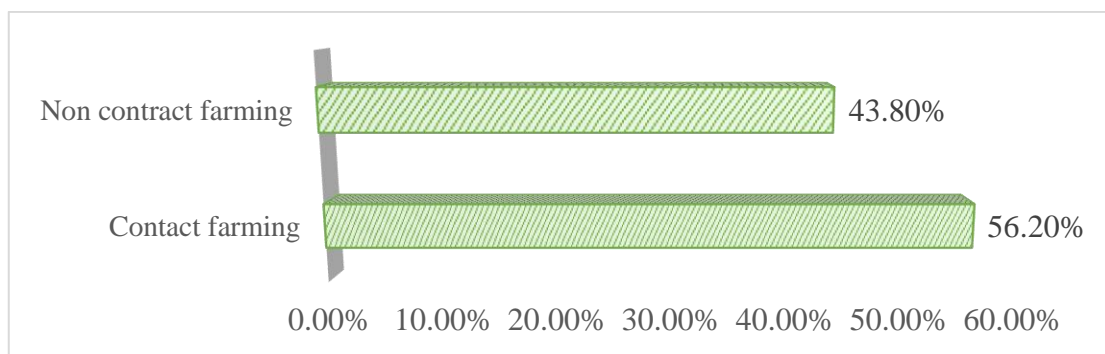

Figure 11. General level of contract farming in Kosovo Agriculture
Source: Author's own work based on SPSS 21 Results

Figure 12 illustrates details for contract type, farmers which declared that they have agricultural contract farming nearly half of them (47,37 percent) they have verbal contract (informal contract or oral agreement) and only a small number of farmers (8.83 percent) declared that they have written contract (formal contract).
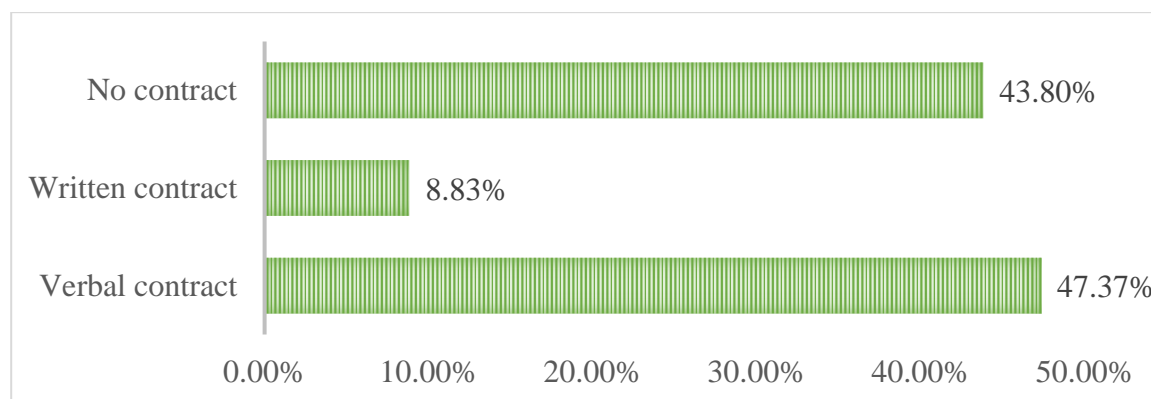
Figure 12. Type of contracts
Source: Author's own work based on SPSS 21 Results

The logistic regression model produced a statistically significant result of $\chi^2(12) = 59.282$, $p < 0.001$ for the logistic regression model. This model explained between (Cox & Snell R Square) 21.0 % and (Nagelkerke R^2) 28 % of the variance in contract farming and correctly classified 70.7 % of the cases. Additionally, we received an insignificant values for Goodness–of–fit test (Hosmer

and Lemeshow) χ^2 (8) = 4.864, p > 0.772. The logistic regression result of the parameters determining contract farming of farmers in Kosovo is shown in table (9) below.

The result showed that Predicted logit of (CONTRACT FARMING) = –4.330+ (1.298) *LOCATION + (.453) *GENDER + (0.172) *AGE + (0.096) *EDUCATION LEVEL + (.007) *TRUST(1) + (0.364) *TRUST(2) + (0.090) *TRUST(3) + (0.045) *TRUST(4) + (1.333) *COOP+ (1.299) *TYPE OF FARMING(1) + (-0.695) *TYPE OF FARMING(2)+ (0.020) *SIZE OF FARM.

Based on Binary logistic regression (Table 9) showed that location, cooperation, and type of farming were significant predictors in contract farming (p < 0.05). While gender, age, education level, trust and size was marginally non-significant (p > 0.05). (I) In contract farming, the location of farmers shows a substantial positive (p < 0.05) association. Furthermore, contract farming was less widespread in urban farms than in rural farms, and urban farmers had a higher proclivity to engage in contract farming than rural farmers. As a result, the number of farms in rural regions is increasing; the odds ratio of contract farming is 3.661times higher than in urban areas. (II) A gender has no significance (p>0.05) when it comes to contract farming, according to the next preditors variables. This is in direct opposition to the conclusions of BELLEMARE (2012); UGUSSIE (2009) which showed that male are more likely to joing CF in agriculture compare to female. (III) Age of farmers does not have a significance (p>0.05) entering into contract farming. This is contrary to the findings of MUROIWA (2019); SIMMONS ET AL., (2005) which showed that yonger farmers are more likely to joing CF in agriculture compare to older farmer. (IV) Education of does not have a significance (p>0.05) entering into contract farming. This is contrary to the findings of KANANA (2019); LOQUIAS ET AL., (2021); MUROIWA (2019); RONDHI ET AL., (2020); SIMMONS ET AL., (2005); SWAIN (2012). (V) Trust of farmers does not have a significance (p>0.05) entering into contract farming. Different results were found in the study of AAZAMI ET AL., (2011). (VI) It was also noticed that there was a positive significance (p<0.01) between the cooperation activity and contract farming. As a result, it increases the number of farmers which cooperate with each other the odds ratio of CF increases 3755 times grater compared to non cooperation farmers. Similar results were found in the study of SIMMONS ET AL., (2005). (VII) The next variable was the type of farming which has positive significance (p< 0.01) in contract farming, vegetable producers are more likely to cooperate 3.664 times greater compared to cereal producers. Result showed that also mixed farms have a significant negative relationship (p < 0.05) in contract farming. Higher number of farmers engaged with mixed farms would correspond with lower odds of contract farming, whereas farmers who are engaged with cereals are 2.00 (1/0.499) times more likely to enter into contrat farming. Moreover, it can be seen in the difference in mean among groups; 2 (vegetable) which have contract farming is greater (0.19 ±

0.397), compared to group 1 (cereals) (0.11 ± 0.319) and group 3 (mix farms) (0.19 ± 0.395) . (VIII) The last element was the size of farms which does not have a significance (p>0.05) entering into contract farming. These results are confirmed by KANANA (2019). Some of the authors such as MENSAH (2012); RONDHI ET AL., (2020); SIMMONS ET AL., (2005) stated a negative influence in participation on contract farming by farm size. Contract farming is largely formed by the farm`s location (LOC;0.17), followed the type of farming (TYPE; 0.15) and cooperation activity (COOP; 0.13), according to the value of R^2.

Table 9. Factors affecting contract farming

FACTORS	B	S.E	Wald	Df	p-value	Exp(B)	R
I. LOC (Urban) Rural	1.298	0.363	12.810	1	0.000	3.661	0.17
II. GEN (Urban) Male	-	-	-	-	0.485	-	-
III. AGE (50-80) 14-49	-	-	-	-	0.596	-	-
IV.EDU(University) Primary/higher school	-	-	-	-	0.794	-	-
V. TR	-	-	-	-	0.978	-	-
VI. COOP (No) Yes	1.323	0.465	8.099	1	0.004	3.755	0.13
VII. TYPE(Cereals)			13.220	2	0.001	-	0.15
Vegetable	1.299	0.517	6.312	1	0.012	3.664	0.10
Mix farms	-0.695	0.335	4.303	1	0.038	0.499	0.07
VIII. SIZE	-	-	-	-	0.912	-	-
Constant	–4.330	1.422	9.270	1	0.002	0.013	0.08

–2 Log likelihood = 285.580; Hosmer and Lemeshov test (X2 = 4.864, df = 8, p = 0.772); Pseudo R–squares (Cox and Snell R2 = 21%; Nagelkerke R2 = 28%); Overall percentage of correctly predicted = 70.7%; B: unstandardized regression weight; S.E.: standard error; Sig.: significance; Exp(B): exponentiation of the B coefficient; Wald.: Wald chi-square value; Df.: the degrees of freedom. ("-" Factors that were not shaped in contract farming)

Source: Author's own work based on SPSS 21 Results

The difference in income between contract and non-contract farmers in Kosovo was determined using an independent Sample t Test (Table 10). The results showed that there is a significant difference in income by contract farmers (M $_{cont}$=15418.39, M $_{non-cont}$=10607.02, t=2.135, p<0.035,

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[2] Papers on methodology recommend the use of the so-called R value to express the role and power of specific independent variables in a model. The size of the value denotes the order of „importance" of independent variables. This index is not a part of the output of the model, it needs to be calculated using the following equation: $R = \sqrt{\dfrac{Wald - 2df}{D_0}}$.

d=0.352), between the contract and non-contract farmers. These results are proved by LITTLE & WATTS (1994); LOQUIAS ET AL., (2021); WANG ET AL., (2014).

Table 10. Comparison of income between contract farmers and non-contract farmers

Variables	**Contract farmers**	**Non-contract farmers**				
	Mean	*Mean*	*Mean Difference*	*t-value*	*p-value*	*d-value*
Income	15418.39	10607.02	2670.135	2.135	0.035	0.352

Source: Author's own work based on SPSS 21 Results

3.4 Comparable research of cooperative & non-cooperative farmers in Kosovo

The results revealed that the majority of farms (92.7 percent) were managed by males and the remaining (7.3 percent) by females, based on socio-demographic, agricultural, and economic aspects of cooperative and non-cooperative farmers. The male farmers made up the majority of the cooperative farms (88.9 percent), with female farmers accounting for about 11.1 percent of the entire sample. In the non-cooperative sector, 94.2 percent of farms were led by men, while 5.8% were led by women, similar to the proportions reported in cooperative farms. The cooperative farmers' average age was 44.53 years, whereas non-cooperative farmers' ages ranged from 24 to 73 years, with a mean of 48.52 years. The average age of the cooperative and non-cooperative farmers revealed that both were middle-aged farmers in their generative years, making them more inclined to approve innovation sooner (ONYENWEAKU, 1991). From the total sample, it could be seen that a low percentage of the cooperative farmers and non-cooperative farmers (9.1 percent) had finished agriculture education. Most of the respondents (90.9 percent) had completed other type educations (High school or University). Farmers, both cooperative and non-cooperative, have low literacy levels, which may make it difficult to obtain and use modern agriculture inputs. Education improves farmers' ability to make precise and meaningful management choices (IMONIKHE, 2010). When farmers were asked if they rent land, nearly half of the cooperative farmers (44.4 percent) declared that they take land for rent, whilst non cooperative farmers (29.2 percent) rent extra land too. The distribution of the family member engaged in agriculture shows that non cooperative farmers had on average 3 persons which were engaged directly in agriculture and most (85.5 percent) revealed they do not hire seasonal employees, while cooperative farmers had on average 4 persons engaged in agriculture, also more than half (53.3 percent) of this group of farmers hire seasonal employees.

Results stress that most (85.7 percent) of the cooperative farmers share the agriculture machinery with other farmers and many among them (86.7 percent) are ready to invest (buy) in agriculture machinery with other farmers. The level of trust among cooperative farmers is higher (62.2 percent) as compared to the other group. In the case of non-cooperative farmers, the results emphasize that sharing agricultural machinery with other farmers is relatively lower (46.3 percent) and also their readiness to invest (buy) in agriculture machinery is low because of the very low level of trust (5.8 percent). Coming to the economic factors, cooperative farmers have small farm size on the average 7.8 ha, unlike non-cooperative farmers who have a slightly larger size on the average 9.0 ha. The income distribution shows that majority of the cooperative farmers earn an average income of 11.215 € per year, while the non-cooperative farmers earn an average of 7.616 € yearly. Finally, the type of production presents that cooperative farmers were engaged with vegetables production, while non cooperative farmers in cereals, fruits and animal farms.

3.4.1 Relationship among farmers in their socio-demographic, agricultural and economic factors

There is a wide gap in the information on cooperatives in developing countries, especially for Republic of Kosovo as a part of Balkan countries, frequently it is not just a missing information but also the information which might be provided is not in English. As a result, there is a dearth of study on the contrast between cooperative and non-cooperative farmers in the literature, particularly when it comes to agricultural difficulties. Few similar studies in the area that look at the prospects of cooperative and non cooperative farmers do not go far enough into the challenges that they confront (AJAH, 2015; NEUPANE ET AL., 2015; PETCHO ET AL., 2019; VERHOFSTADT & MAERTENS, 2015).

As a result, the findings of this study are critical for better understanding the disparities between cooperative and non-cooperative farmers in Kosovo in terms of socio-demographic, agricultural, and economic characteristics. The Chi-Square Test has been applied to see if there was a link between the socio-demographic, agricultural, and economic aspects of both groups of farmers (Table 11). For socio-demographic parameters, the results suggest that education level ($X2$ (1)=8.910, p< 0.003, V =.232) has a significant relationship with cooperative or non cooperative farmers, however the relationship is weak. Moreover, unlike non-cooperative farmers, cooperative farmers have completed agriculture education. In Kosovo, agricultural education is expected to raise knowledge of the advantages of joining cooperatives. Farmers who have completed agriculture education are more likely to join a cooperative than those who have completed other

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forms of education. Several differences between cooperative and non-cooperative farmers, such as gender (X2 (1)=1.352, p>0.245, V=0.091), and age (X2 (3)=4.605, p>0.203, V =0.203), proved to be insignificant. AJAH (2015); VERHOFSTADT & MAERTENS (2015) reported similar results whereas NEUPANE ET AL., (2015) obtained different results. Similarly, the age result agrees with the findings of AJAH (2015); PETCHO ET AL., (2019), but varies with the findings of NEUPANE ET AL., (2015).

"Almost all members of the cooperative are females, since they are more eager to collaborate with each other, attend different trainings, are more committed to work, and more mindful of agricultural crops than men," says KB Krusha, the cooperative's head. The agricultural factors such as family involved in agriculture (X2 (1)=5.434, p<0.020, V=.181), seasonal employee (X2 (1)=5.036, p<0.025, V =0.175), machine sharing (X2 (1)=19.208, p<0.000, V =0.358), willigness to buy agricultural equipment with other farmers (X2 (1)=19.083, p<0.000, V =0.340), and trust (X2 (4)=63.305, p<0.000, V =0.619), are very distinct. In comparison to non cooperative farmers, the majority of cooperative farmers included their families in agriculture and had a weak link, according to the findings. The findings revealed that cooperative farmers involve more family members in agricultural activity, hire more seasonal workers, utilize somewhat more agricultural equipment than Hungarian cooperative farmers (PAPP-VARY ET AL., 2019), and are willing to invest in agriculture machinery with other farmers. Trust was recognized as a key component in the case of cooperative farmers, which is somewhat greater than in the case of non cooperative farmers. The research of produced a variety of outcomes SOLEK & BEMBENEK (2004).

Table 11. Comparison of demographic, social and economic characteristics of cooperative and non-cooperative farmers

Variables				
Socio-demographic	X^2	*D*	*p-value*	*V**
I. Gender	1.352	1	0.245	0.091
II. Age	4.605	3	0.203	0.167
III. Edu. Level	8.910	1	0.003	0.232
Agriculture				
IV. Experience on farming	9.402	2	0.009	0.239
V. Rent land	3.438	1	0.064	0.144
VI. Family involved in agriculture	5.434	1	0.020	0.181
VII. Seasonal employee	5.036	1	0.025	0.175
VIII. Sharing machineries	19.208	1	0.000	0.358
IX. Willingness to buy machinery with others	19.083	1	0.000	0.340
X. Trust	63.305	4	0.000	0.619
Economic XI. Size of farms	1.059	3	0.787	0.080
XII. Income	10.345	3	0.016	0.438
XIII. Production type Cereals	6.239	1	0.012	0.194
Vegetables	25.054	1	0.000	0.390

Fruits	9.179	1	0.002	0.236
Animal farms	4.198	1	0.040	0.160

* Cramer's V

Source: Author's own work based on SPSS 21 Results

In contrast to non-cooperative farmers, more than half of cooperative farmers utilize seasonal workers, according to the data. Unlike non-cooperative farmers, cooperative farmers utilize agricultural equipment with other farmers and are willing to acquire or invest in agriculture machinery with other farmers. Cooperative farmers have a greater level of trust than non cooperative farmers, according to the findings. The fact that farm managers are solely involved in agriculture activities might be one of the causes behind this. In this instance, they enlist the help of their family members, especially during the planting, tilling, and harvesting seasons, when a large number of workers is required.

This might be attributed to outdated agricultural equipment: "every second farmer owns a tractor that is more than 80 years old in the same time farmers are interested to invest on a newer technology with other farmers in order to reduce the cost of the labour force and prevent production loss. The results show that for agricultural factors like land rent ($X2$ (1)=3.438, p>0.064, V=0.144), a significant difference could not be seen between cooperative farmers and non-cooperative farmers. As reported by the economic factors such as the size of farms ($X2$ (3)=1.059, p> 0.787, V =0.080), the difference was not significant between the two groups. These findings are in line with the results of AJAH (2015), but differ from the results of JULIUS (2013); PETCHO ET AL., (2019); VERHOFSTADT & MAERTENS (2015). Based on the personal interview "I found out that on small farms (subsistence) the decisions are most of the times made only by the oldest members of the family, who usually have not heard about cooperation in agriculture before and their main source of information was other neighbor farmers". In terms of income, a significant link was discovered ($X2$ (3)=10.345, p< 0.016, V =0.438), showing that cooperative farmers earn more than non-cooperative farmers, characterized by a moderate correlation. This finding is confirmed by the findings of CHEN ET AL., (2018), IBEZIM ET AL., (2010), VERHOFSTADT & MAERTENS (2015) and WANG ET AL., (2019), but not by the findings of PETCHO ET AL., (2019) and SHUMETA & D'HAESE (2018). A significant relationship was found between production type and cooperative farmers' involvement in vegetable production ($X2$ (1)=25.054, p<0.000, V =0.390) while non cooperative farmers' involvement in cereals ($X2$ (1)=6.239, p<0.012, V =0.194), fruits ($X2$ (1)=9.179, p< 0.002, V=0.236) and animal farms ($X2$ (1)=4.198, p<0.040, V=0.160) was found to be. This group of farmers mostly uses their agricultural goods for personal use. The market is not their objective.

3.4.2 Motivation for formers to join a cooperative

The results in Table (12) show some plausible motivations for the farmers to join a cooperative.

Table 12. Motivations to join a cooperative

Sort	Agree Disagree	Frequency & Percentage	Mean & S.D.*
No need to find buyers	*Agree* *Disagree*	41(91.1%) 4(8.9%)	1.09 ± 0.288
Better Prices (Fixed)	*Agree* *Disagree*	30(66.7%) 15(33.3%)	1.33 ± 0.477
Social Reasons	*Agree* *Disagree*	15(33.3%) 30(66.7%)	1.67 ± 0.477
Better Services	*Agree* *Disagree*	22(48.9%) 23(51.1%)	1.51 ± 0.506
Family Reason (Family Members)	*Agree* *Disagree*	6(13.3%) 39(86.7%)	1.87 ± 0.344
Credit (for agricultural supplies)	*Agree* *Disagree*	10(22.7%) 35(86.7%)	1.78 ± 0.420
Information Source	*Agree* *Disagree*	31(68.9%) 14(31.1%)	1.31 ± 0.468
Agriculture machinery	*Agree* *Disagree*	6(13.3%) 39(86.7%)	1.87 ± 0.344
Other reason (various answers)	*Agree* *Disagree*	5(11.1%) 40(88.9%)	1.89 ± 0.318

* Standard deviation

Source: Author's own work based on SPSS 21 Results

Based on the results, the reasons that farmers consider as motivational to join a cooperative are as follows; no need to find buyers, information sources, better prices, and better services. However, other motives such as social reasons, credits, family reasons, agriculture machinery are factors that do not necessarily persuade farmers to join a cooperative.

3.4.3 Selling channels for cooperative and non-cooperative farmers in Kosovo

The impact of disparities in selling channels was investigated in light of the major variances in economic considerations.
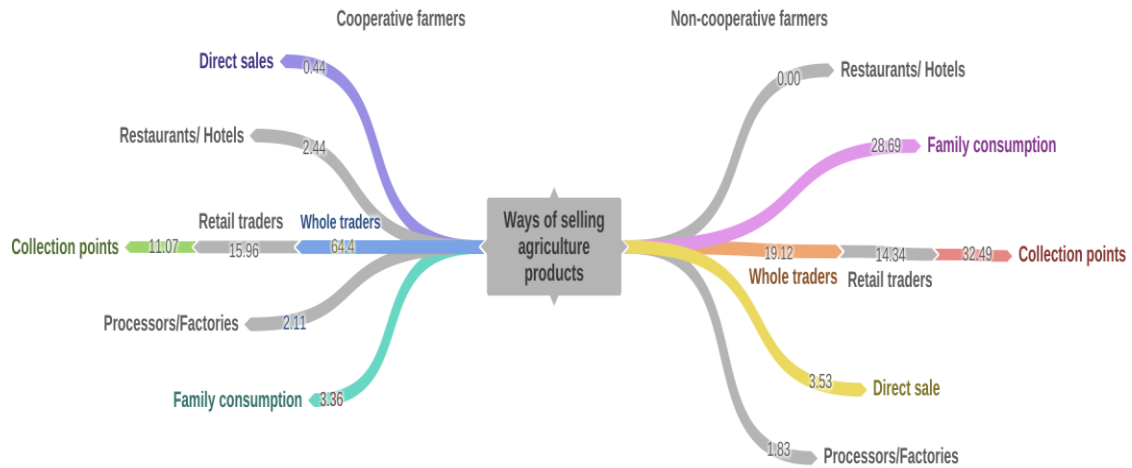
Figure 13. Selling channels for cooperative and non-cooperative farmers
Source: Author's own work based on SPSS 21 Results

The data in Figure 13 show how cooperative and non-cooperative farmers sell their farm products. According to the findings, cooperative farmers sell more than half of their produce (64.4) to wholesale dealers, (15.96) to retail traders, (11.07) to collecting locations, and just only a small portion (3.36) uses them for family consumption. Based on the results, this group of farmers does not make much use of restaurants/hotels (2.44), processors/factories (2.11) and the directs sales (0.44) as a sales channel.

When it comes to non-cooperative farmers, about 32.49 of the total produce is sold through collection points, (19.12) whole traders, (14.34) through retail traders and a considerable amount of products (28.69) is used for family consumption. The findings show that this group sells a small amount of their produce through; directs sales (3.53), processors/factories (1.83) and does not sell to restaurants/ hotels (0). It has been found that two groups of farmers use different sale chains to market their produce. The difference in selling channels between cooperative and non cooperative farmers in Kosovo was determined using an independent Sample t Test (Table 13). The findings revealed that there is a significant difference in selling channels by whole traders (M coop=64.40, M non-coop=19.12, t=6.489, p< 0.000, d=0.484), directs sales (M coop=0.44, M noncoop=3.54, t=-3.081, p<0.033, d=0.283),collection points (M coop=11.07, M non-coop=32.49, t=- 4.467, p< 0.000, d=0.727) and family consumption (M coop=3.36, M non-coop=28.69, t=-7.755, p<0.000, d=1.046) among the cooperative and non cooperative farmers. It was discovered through qualitative interviews that "The majority of farmers do not conclude an agreement (enter into a contract) for agricultural selling, they choose selling channels (which offers more incomes) when the product is ready for market, but it was evident that many small farmers have sold their products even below production cost or in some cases have thrown their products away since they could not sell them in any way".

Table 13. Comparison selling channels between cooperative and non-cooperative farmers

Selling channels	Coop. farmers	Non-coop farmers				
	Mean	Mean	Mean Difference	t-value	p-value	d-value
Whole trades	64.40	19.12	45.283	6.489	0.000	1.184
Processors/factory	2.11	1.83	0.273	0.135	0.893	0.026
Retail traders	15.96	14.34	1.614	0.304	0.762	0.053
Restaurants/hotels	2.44	0.00	2.444	1.565	0.125	-
Direct sales	0.44	3.54	-3.081	2.154	0.033	0.283
Collection points	11.07	32.49	-21.425	-4.467	0.000	0.727
Family consumption	3.36	28.69	-25.336	-7.755	0.000	1.046

Source: Author's own work based on SPSS 21 Results

The results imply that the members of cooperative sell most of their produce through whole traders as compared to the non-cooperative farmers. Wholesalers are reported to be almost the only channel through which fruits are distributed in Kosovo (GJOKAJ ET AL., 2017). Similar results in the study of HAO ET AL. (2018). It could be understood that non-cooperative farmers sell most of their produce through direct sales. Non-cooperative farmers also sell a slightly higher amount of their total produce through collection points compared to the cooperative farmers. Finally, the results show that the non-cooperative farmers use a sizeable amount of the total produce for family consumption while comparing with that of the cooperative farmers.

However, for other selling channels such as processors/factory ($M_{coop}=2.11$, $M_{non-coop}=1.83$, $t=0.273$, $p>0.893$, $d=0.026$), retail traders ($M_{coop}=15.96$, $M_{non-coop}=14.34$, $t=0.304$, $p>0.762$, $d=0.053$) and restaurants/hotels ($M_{coop}=2.44$, $M_{non-coop}=00$, $t=1.565$, $p>0.125$), a significant difference could not be found between cooperative and non-cooperative farmers.

Smallholders are mostly more vulnerable to economic shocks including COVID-19 lokcdown, as long as they have low productivity, low amount of savings and investments (GUIDO ET AL., 2020). This period of time –cooperative farmers have become handy as collection centers and at the same time minimize the risk of virus transmission since farmers drop off their product in one fixed place, while a single member of the cooperative is responsible for selling the product (DEUJA, 2020).

IV. CONCLUSION AND RECOMMENDATIONS

Conclusion

The historical, cultural and economic background of the country also influences the situation and structure of agriculture and the behavior of farmers. In the agriculture of Kosovo, the

pace of the transition to modern agriculture is slower, both technologically and institutionally, than in the countries of other Central and Eastern Europe. However, the level of cooperation between farmers in these countries is also not even the required level, as Kosovo lags behind them. Kosovo is on its way to EU accession. This process is very slow and the effects on the restructuring process of support are also lagging behind.

As a consequence of my research, I have reached the following conclusions;

1. The research adds new knowledge through identifying new variables that impact agricultural cooperation in Kosovo. The findings show how important demographics and economic considerations, as well as trust levels are in the establishment of cooperative action. Farmers who live in the rural areas, and those who are younger and have a high level of education, show a higher level of cooperation activity that can be statistically confirmed, whereas farmers who seem to have a low education level and are managed by males are less supportive to cooperation, according to the descriptive analysis of demographic indicators. The economic variables point to the fact that medium-sized farms have a high level of collaboration that can be statistically validated, whereas small and large farms are less likely to collaborate.

2. Regarding to contract farming, there are three factors that significantly influence the participation of Kosovo farmers in contract farming. Location, cooperation activity and type of farming have a positive influence on farmers' decisions. The result implies that farmers which are located in rural areas which are engaged with vegetable productions and are member of any cooperative/association or cooperate in informal way with other farmers have the strongest effect on participation in contract farming. Meanwhile, gender, age education level, trust and size of farm has a negative effect.

3. The study uncovers major and new differences in the socio-demographic, agronomic, and economic characteristics of cooperative and non-cooperative farmers in Kosovo. According to the statistics, the number of cooperative members in the country is still quite limited. The findings also reveal that cooperative development is influenced by socio-demographic, agricultural, and economic factors. Usually, cooperative farmers are involved in vegetable production, they have more access to seasonal labor, machinery through sharing, are more willing to invest in equipment with other farmers, and have a higher level of trust between farmers than non-cooperative farmers. Furthermore, cooperative farmers appear to generate more revenue than non-cooperative farmers. Non-cooperative farmers, on the other hand, are farmers who generally cultivate and deal with

cereal, fruit, and livestock production. While other factors which are not significant are; gender, age, rent land and size of farm.

4. Farmers consider the following characteristics to be motivating to join a cooperative: no need to identify buyers, better knowledge, better pricing, and better services.

5. The differences between cooperative and non cooperative farmers' selling channels were statistically demonstrated. According to the findings, cooperative farmers sell the majority of their produce through whole dealers, whereas non cooperative farmers sell it directly or through collection sites, with a significant portion going to family consumption.

6. The period of crises (COVID-19) highlights the need for cooperation among farmers and making family farming system more sustainable and strong in case of future crises.

Recommendations

Based on the empirical evidence of this study, following recommendations and managerial implications are given to the policy makers, farmers and researchers:

1. Cooperation, particularly horizontal integration, will play a critical role in enhancing productivity in developing countries like Kosovo, which has a large number of dispersed farms, in this way negotiating power would also be increased together with the returns to scale, while it will also impact the cost of production by slightly decreasing it.

2. In a developing country like Kosovo, contracting development is critical for both farmers and contractors in order to ensure future market access and risk management.

3. According to the results, there is a need for a tool to increase the participation of poorer farms in cooperatives and to improve member benefits as prospective regions in making cooperatives more purposeful, stimulating, and sustainable. Our own personal experience implies that emotional bonds between farmers should be taken into account. This is seen as a crucial component of any support program's success.

4. The findings aid governmental and non-governmental organizations in encouraging farmers to form or join sustainable cooperative, through informal education, seminars presentations and financially encouraging.

5. The fourth revolution is currently seen as a possible solution for improving agricultural growth, ensuring the future needs of the global population in a fair, resilient and sustainable way. Government should find different forms to pass the barriers of farmers for land fragmentation (by increasing farm size) and knowledge on technology use.

4.1 Research Limitations

It is crucial to emphasize that this study has certain limitations, which are partly as a result of the fact that internet access and knowledge are extremely limited in Kosovo. Considering that the interviews were performed one-on-one with each farmer, the sample size was limited, but it did have the advantage of enhancing the desire to answer and the authenticity of the responses.

It is also worth noting that, despite increased interest among policymakers and researchers, the literature and statistical data on cooperation, cooperatives, and contract farming in Kosovo are limited.

V. NEW SCIENTIFIC RESULTS

1. Researching this topic was a complex task. In Kosovo, as in a young republic, there is no reliable and available background data and statistics on agriculture in general, but this is the first survey based on extensive direct data collection on the food chain and the willingness of stakeholders to cooperate and forms of their cooperation.

2. The results of the research allow to gain an understanding of the behavior of farmers, the motivations of cooperation and the factors mostly emotional and educational creating barriers of non-cooperation. The results of this research contribute to the scarce literature common not only in Kosovo but also in the Balkan countries and make methodological recommendations for data collection and analysis.

3. In my empirical research, it has been revealed that the level of cooperation among farmers in Kosovo is low due to the lack of trust in the cooperative institutions. Informal cooperation (between farmers) has been seen to be present as a result of satisfactory trust between neighbors. Results highlight the significant role that demographics and economic factors likewise the level of trust play in the formation of cooperation activity

4. One of the results brought forth by this study, almost half of the interviewed farmers do not have contracts, the rest who claimed to have contracts have a verbal agreement and a very small part claimed to have a written contract. Results stress that socio-demographic and economic factors affect the willingness of Kosovo farmers to participate in contract farming.

5. Results also highlight the significant relationship in socio-demographic, agricultural and economic factors in the formation of cooperatives. Cooperative farmers are mostly involved in vegetable production. They have more access to seasonal employees, machinery through sharing, higher readiness to invest in equipments with other farmers and a higher level of trust between farmers, in contrast to non-cooperative farmers. In addition to that, cooperative farmers appear to have higher level of income than non-cooperative farmers.

6. Based on the obtained results, some of the factors that farmers consider as motivational to join a cooperative are; no need to find buyers, better information source, better prices and better services.

7. Another important result found is that differences in the selling channels used by the cooperative and non-cooperative farmers were statistically demonstrated. The results imply that the cooperative farmers sell most of their production through whole traders, while noncooperative farmers through direct sale, collection points and a sizeable amount is used for family consumption.

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