KnE Social Sciences

EBEEC
Economies of the Balkan and Eastern European Countries
Volume 2021

Knowledge E
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Conference Paper

Investing in Greek Agriculture: A Case Study on Farmers in the Regional Unity of Serres, Greece

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Published: 30 November 2021

Publishing services provided by Knowledge E

Selection and Peer-review under the responsibility of the EBEEC Conference Committee.

Abstract

The Greek Ministry of Food and Agriculture is proceeding in its commitment to apply reforms of the current Common Agricultural Policy (CAP) 2014-2020. Among other measures, in November 2017 two fundamental agricultural projects were introduced: the 4.1.1., which focuses on potential investments in fixed assets and machinery, and the 4.2.3., which relates to potential investments in renewable energy resources such as net-metering systems. Investments in agriculture are considered of critical importance given their potential contribution to the Greek economy. The CAP is undoubtedly an integral and crucial part of the general Common European Policy in terms of agriculture. Nevertheless, European policies have attracted intense negative criticism including from distinguished and Nobel Prize-awarded writers and researchers such as Krugman and Stiglitz. This paper focuses on the probability and sustainability of rural investments dealing simultaneously with a profile analysis of the prospective investors. It consists of two main parts. The theoretical first part presents the special characteristics of the two implemented measures. The second part presents the empirical research carried out with farmers of the area, which was conducted via questionnaires. Participants submitted Action Improvement Plans supporting the 4.1.1 or/and 4.1.3 measures. Data were collected through personal interviews and the opportunity sampling method was used. Data were analyzed through descriptive and inducted statistical methods. This research expands the discussions around the rural investments concept.

Keywords: Common Agricultural Policy, rural development, investments

JEL Classification Codes: R58 Regional Development Planning and Policy

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1. Introduction

Rural areas play a vital role in the European Union (EU), as they cover more than 90 percent of the European territory and host about half of its population and economic activity [1]

Increasing challenges in agriculture and rural areas in Europe lead new approach of implementing the second pillar of Common agricultural policy. The second pillar aims to ensure the viability of rural and regional economies and diversification on a regional level.

The main purpose of this paper is to evaluate the impact of investments in the primary sector of the economy under the context of Common Agricultural Policy. Today, all rural areas confront important economic, environmental, and territorial challenges [1]. The implementation of policies for Rural development in Greece subsidies the investments in the primary sector to increase the competitiveness of agricultural enterprises. Moreover, the Rural Development program focused on food security, environmental protection, and the development of territories. The implementation of CAP in the past succeeded in the drop in production costs (thanks to the decreased labor cost), the increase in agricultural income (automation, etc.), the preservation of farmers' income through the acceleration of farm activities (harvesting). Additionally, it was observed that both the farmer and his family were relieved from the tiring works in the field. All these factors encouraged farmers to expand their farms [2]. In this context, The Ministry of Rural Development and Food announced in November 2017 Actions 4.1.1 - Implementation of investments contributing to the competitiveness of the holding and Action 4.1.3 - Implementation of investments contributing to the use of GDP as well as to the protection of the environment.

In recent years Economic shocks have negatively affected national and regional economies regarding the gross domestic product (GDP) and employment generation [3]. The Great Recession that started in 2010 has offered new insights into the complexity of economic development and has brought up new ways of thinking and interpreting economic activity and its connection to the economy of the regions. The effects of the crisis were particularly more profound and destructive in some countries. Greece is also among these countries [4]. However, the impacts of the economic recession are not homogeneous across all the economic sectors, indicating the ability of certain production sectors to better withstand the recessionary effects [3]. Rural areas are inherently diverse, hence affected in different ways, and to differing extents, by the external forces with which they interact [5]. The agri-food sector has never been taken into much consideration in the economic literature concerning the effects of the crisis, as it has traditionally been seen as an anti-cyclic sector which, on account of its characteristics, can absorb and soften the microeconomic [6]. . From 2010, the burst of the economic crisis, and onwards, Greece underwent the imposition of austerity measures, a decreased demand even for agricultural products, the cancel of the subsidized oil, and very high taxation for the farmers [7]. In contrast, the picture of Greek agriculture has not changed dramatically during the recent economic crisis. Since 2010, the first year of the recent international crisis, which became a debt crisis in the case of Greece, the

latter's agriculture has managed to maintain the absolute number of employment and to improve it as a percentage of the total. The primary sector lost only 13.96% of its value-added, ending up with a share of 3.7% to the total gross value added compared with a loss of more than 40% of gross value added for industry (share of 16.5% of the total in 2013) and almost 25% for services. However, agricultural production increased by 6.6% at constant prices in 2013, although the sector's productivity, i.e. gross value added against employment, decreased by almost 12% during this period [8]. Monastiriotis [9] analyses the impact of austerity measures on regional income and inequalities, arguing that the horizontal measures are widening existing disparities – something that may be difficult to redress in the future. Greek agriculture, while being fully integrated into the European agricultural system, is called to survive in a very competitive and volatile environment, without thus far being able to compete, except for some very big farming corporations [2]. The empirical part of the survey was conducted using questionnaires that involved farmers from Serres applying for inclusion in one of the above measures. The convenience sampling method was used, and personal interviews were used to collect the data. The data were processed using descriptive and inductive statistical methods. The average, standard deviation, coefficient of variability, and correlation coefficient were calculated.

The results of the empirical research in the above sample of the Farmers of Serres who applied for inclusion in one of the aforementioned measures conclude that there is interest in investing mainly in the semi-mountainous areas. Investments do not focus on the use of RES (Action 4.1.3) but mainly on mechanical equipment such as tractors (Action 4.1.1.). The place was chosen mainly because the Regional Unit of Serres is mostly a rural area and belongs to the Region of Central Macedonia, the Region with the largest contribution to the rural population of Greece and at the same time the poorest one. The timing of the survey in October 2018 coincided with the completion of applications for the measures. The results are expected in the Fall of 2019.

This paper is organized into two parts. The first part is divided into two subchapters, the first one presents the two Actions, the second the special characteristics that led to the selection of the Regional Unit of Serres as the research area, then follow the research questions, and the second part presents the empirical research on Serres farmers. The conclusions of the study are generally consistent with those reported in the relevant literature.

2. Actions 4.1.1 and 4.1.3

According to the proclamation 13158/ Athens 28-11-2017 of the Special Implementation Service RDP 2014-2020 of the Ministry of Rural Development and Food, has been established the institutional framework for the implementation of the sub-measure 4.1 "Implementation for investments in agricultural holdings", in particular Actions 4.1.1 "Implementation of investments contributing to the competitiveness of the holding" and 4.1.3 "Implementation of investments contributing to the use of GDP as well as to the protection of the environment". The main objective of Action 4.1.1 is "to improve the competitiveness of sustainable Greek farms by strengthening investments to modernize and

adapt quickly to market needs" while Action 4.1.3 with "investments in the exploitation of renewable energy sources (sun, air, geothermal energy, etc.) for own consumption, proper management of waste and by-products and their use for energy production for own consumption" aims to protect the environment.

The distribution of public expenditure per action and per beneficiary region is as follows:

Table 1: Distribution of public expenditure per action and per region

Region	Total credits	Action 4.1.1	Action 4.1.3
Eastern Macedonia & Thrace	28.824.929	26.923.761	1.901.168
Central Macedonia	59.529.745	55.603.419	3.926.326
Western Macedonia	20.947.309	19.565.714	1.381.594
Thessaly	30.883.853	28.846.887	2.036.966
Central Greece	27.661.190	25.836.777	1.824.413
Epirus	16.292.351	15.217.778	1.074.573
Ionian islands	8.414.731	7.859.731	554.999
Western Greece	28.287.819	26.422.076	1.865.743
Peloponnese	31.331.445	29.264.958	2.066.487
Attica	9.309.915	8.695.873	614.042
South Aegean	9.667.989	9.030.330	637.659
North Aegean	16.560.907	15.468.620	1.092.286
Crete	28.287.819	26.422.076	1.865.743
Country Total	**316.000.000**	**295.158.000**	**20.842.000**

Πηγή: Ministry of Rural Development and Food [10]

As shown in Table 1, the Region of Central Macedonia receives the largest amount.

Regarding the subsidy percentage, the following table 2 presents the funding rates per region and farmer category.

Young farmers, as well as mountain dwellers, receive the maximum grant.

It is worth mentioning the particular awarding of credit points for innovative investments in the context of the actions. A typical reference to the role of innovation: "Innovation and Entrepreneurship tend to be incremental. Both concepts turn to an opportunity or a need that is temporary and will disappear if it is not realized in time or if it does not succeed" [11].

3. Special characteristics of the Regional Unity of Serres

The Regional Unity of Serres is one of the poorest in the country with a per capita GDP below 9.500 € when the average in Greece is € 16.300. Table 3 shows the GDP per capita.

The second reason is that the Region of Central Macedonia is the Region with the highest percentage of rural population, followed by the Peloponnese as shown in Table 4..

Table 2: Financing of an investment project

FARMER CATEGORY	SMALL ISLANDS OF THE AEGEAN SEA	EASTERN MACEDONIA - THRACE & EPIRUS	THESSALY, WESTERN GREECE, CENTRAL MACEDONIA, IONIAN ISLANDS, PELOPONNESE & CRETE	CENTRAL GREECE & WESTERN MACEDONIA	ATTICA
Beneficiaries young farmers	80%	70%	60%	60%	50%
Beneficiaries in mountainous areas	75%	60%	60%	60%	50%
Beneficiaries in areas facing natural or other specific disadvantages	75%	50%	50%	50%	40%
Other farmers in normal areas	75%	50%	50%	40%	40%
Collective investments in all areas	85%	60%	60%	60%	60%

Source: Ministry of Rural Development and Food [10]

Table 3: Per capita Gross Domestic Product (GDP) in Greece 2018

S.N	REGIONAL UNIT	GDP (per capital)
	GREECE	16.336
1	Attica (Attica Region)	22.377
51	Serres	9.381

Source: Hellenic Statistical Authority [12]

The third reason which makes the Regional Unit of Serres an excellent choice is that it is mainly a rural area. This is evident from Table 5 below, where the percentage of farmers exceeds 30% in most municipalities.

4. Methodology

The main question in this survey focused on examining the existence of possible different behavior of farmers concerning their intention to invest. The investment capacity, depending on the particular characteristics of the farmers, was the investigative field. The correlation of the intention for investments, depending on the altitude, was examined and recorded, as was the existence of other correlations such as gender and age, and RES. The empirical quantitative research was conducted through questionnaires which were prepared according to scientific method [13]. The sample consisted of 281

Table 4: Greek Regions - Economically active population (2011)

REGIONS	Economically active population	Primary Sector	Percentage of farmers in the whole country
TOTAL COUNTRY	4.586.636	372.209	100,00
EASTERN MACEDONIA AND THRACE	234.579	38.787	10,42
CENTRAL MACEDONIA	771.613	69.563	18,69
WESTERN MACEDONIA	108.094	11.792	3,16
EPIRUS	129.712	16.002	4,23
THESSALY	283.427	41.954	11,27
CENTRAL GREECE	217.278	30.495	8,19
IONIAN ISLANDS	88.693	6.898	1,85
WESTERN GREECE	261.175	40.248	10,81
PELOPONNESE	233.986	50.439	13,55
ATTICA	1.771.562	17.528	4,70
NORTH AEGEAN	76.628	9.000	2,41
SOUTH AEGEAN	140.016	6.245	1,67
CRETE	269.873	33.258	8,93

Source: Hellenic Statistical Authority [12]

Table 5: Regional Unit of Serres-Economically active population (2011)

DESCRIPTION	**TOTAL FINANCIAL ACTIVE**	**PRIMARY SECTOR**	**PERCENTAGE**
REGIONAL UNIT OF SERRES	63.057	14.151	22,442
MUNICIPALITY OF SERRES	30.106	2.743	9,111
MUNICIPALITY OF AMFIPOLIS	2.675	916	34,243
MUNICIPALITY OF VISALTIA	6.795	2.740	40,324
MUNICIPALITY OF EMMANOUIL PAPPA	4.969	1.499	30,167
MUNICIPALITY OF HERAKLION	7.220	2.437	33,753
MUNICIPALITY OF NEA ZICHNI	4.246	1.953	45,996
MUNICIPALITY OF SINTIKI	7.046	1.863	26,441

Source: Hellenic Statistical Authority [12]

out of 677 total farmers of the Regional Unit of Serres who applied for inclusion in sub-measures 4.1.1. or 4.1.3. The sapling method employed a convenience sample. The questionnaires were completed by personal interview. The survey took place in October 2018 at the time of the application for the investments. The separation in a mountainous - semi-mountainous - lowland area was based on the Ministry of Rural Development and

Food's designation of areas. Semi-mountainous areas include, in addition to areas with natural constraints, areas with special handicaps.

The discrimination in urban-semi-urban and rural areas was done based on the seats of the municipalities. The town of Serres is considered an urban area, while all other municipalities semi-urban areas and the villages rural areas.

4.1. Descriptive statistics and correlations

Results will be analyzed using variables 1 and 2, where there are two categories of farmers (e.g. gender) and 1, 2 and 3 where there are more (e.g. urban-semi-urban-rural areas). Then will be calculated the main quantities of the descriptive statistic, the average, and standard deviation, and the coefficient of variability. Additionally, we will calculate the most common size of inductive statistics, the correlation coefficient.

4.2. Results

As mentioned above, the main objective was to examine the investment behavior of farmers depending on the place of residence/activity in a mountainous-semi-mountainous-lowland area. Figure 1 presents the distribution of potential farmer investors according to the characterization of the area during the period of submission of the improvement plan.

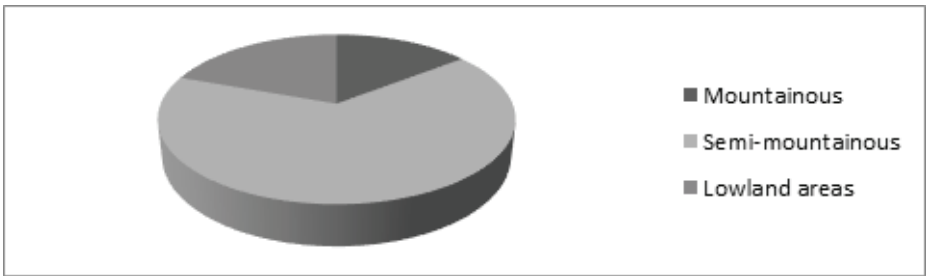

Figure 1: Prospective farmer investors regarding the characterization of the area

In the Regional Unit of Serres, mountain settlements do not constitute the majority. Only 14% invest in mountainous areas, while 2 out of 3 are residents of semi-mountainous (disadvantaged) areas. Therefore the majority of farmers who invest live in semi-mountainous areas. The percentage of 20% corresponding to the lowland settlements is disproportionate to their population. Inhabitants of the lowlands, although they constitute the majority of the population, are reluctant to invest, while the inhabitants of mountainous areas do the opposite. The highest subsidy rates in mountain areas (Table 2) are a decisive factor in decision making.

The distribution according to the level of urbanization was another question. Figures 2 & 3 below present, as expected, that the vast majority of farmers live in rural areas. The urban area of Serres belongs to the lowland zone. According to the geography of the Regional Unit of Serres in the mountainous areas, we find only small settlements

except for Sidirokastro that is included in the mountainous zone. Figure 5 presents the proportional distribution of investment.

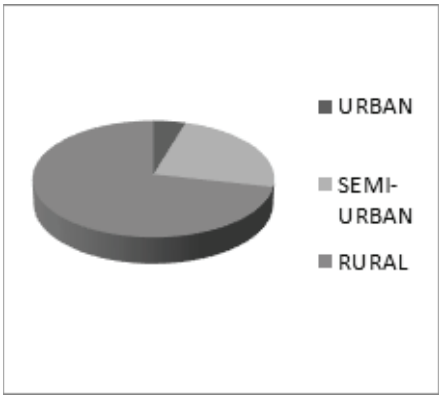

Figure 2: Distribution according to the level of urbanization

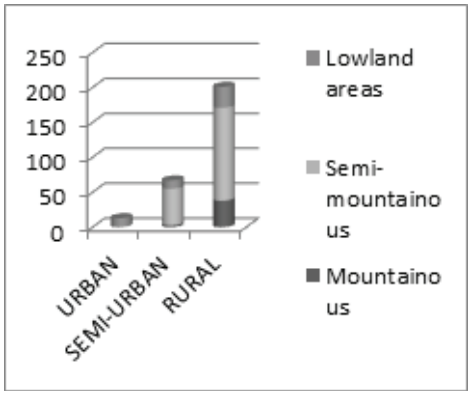

Figure 3: Distribution according to the level of urbanization and altitude

Examining the specificities of the border area was the next issue. Border areas have preoccupied reputable regionalists such as Nijkamp, who points out [14] "Unlike the past, where many border and perimeter areas were 'dead spots' in a country, today their important strategic position as communication poles and trading in an internationalized society is recognized ". Figure 4 below shows the investments in the border zone and the other areas.

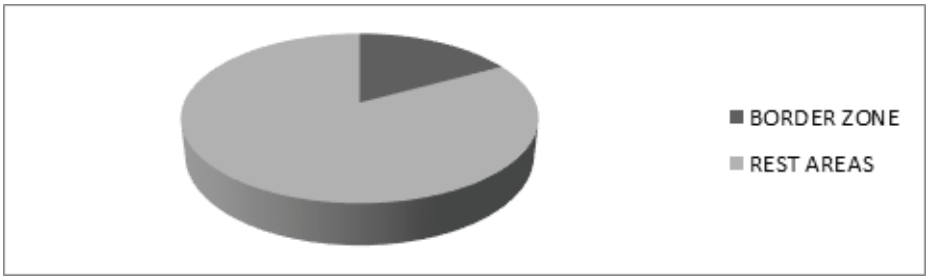

Figure 4: Distribution of investments in the border zone

The following figures 5 & 6 show the investments in the border zone depending on the altitude.

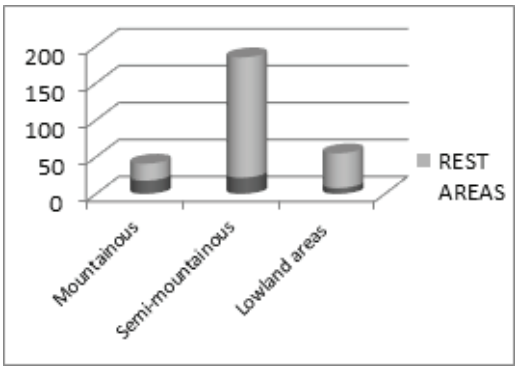

Figure 5: Distribution of investments in the border zone depending on the altitude

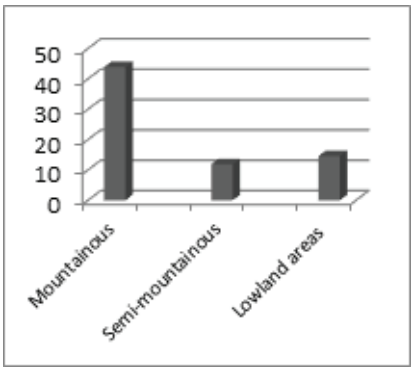

Figure 6: Distribution rates in the border zone

It seems that mountainous areas have higher investment rates.

Examining farmers by gender essentially confirmed the common belief that farmers are predominantly male. The following Figure 7 shows the percentages.

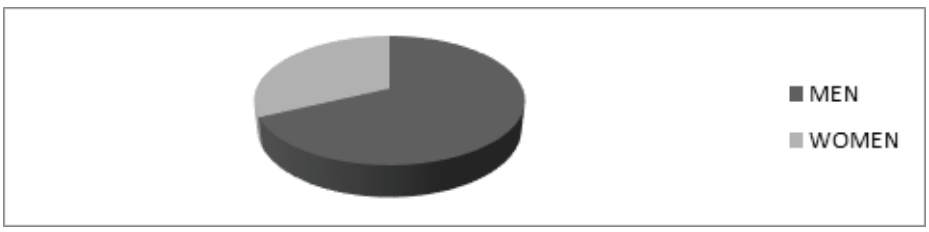

Figure 7: Distribution of farmers' investments by gender

It is a given that despite technological advances, where physical strength is not so necessary for the execution of agricultural work, males are the vast majority of farmers at over 75%. The following figures 8 & 9 show the percentages by gender according to the altitude.

There are no substantial differences between the genders in terms of distribution by altitude.

Age was another factor to consider. Based on the difference in expected subsidies, farmers have been divided into two categories one over-40s and the second under-40s – young farmers. The following Figure 10 shows the distribution.

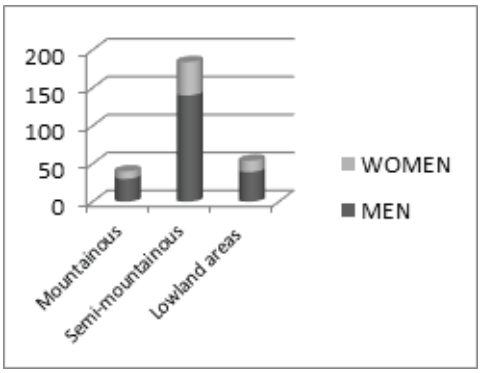

Figure 8: Distribution of farmers' investments by gender according to altitude

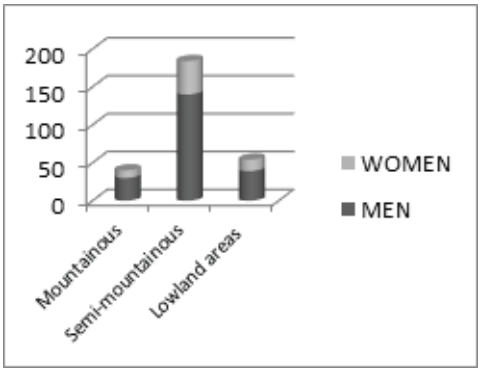

Figure 9: Percentages of farmers' investments by gender

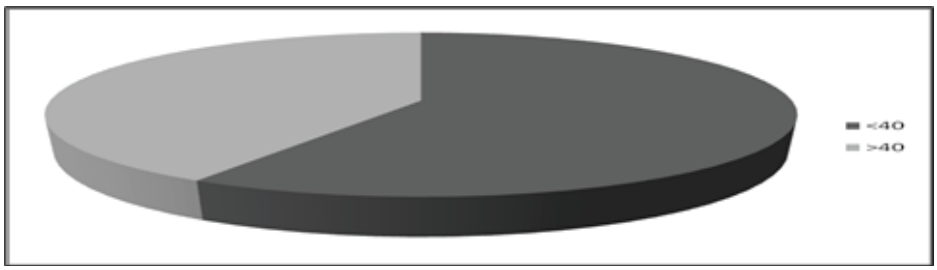

Figure 10: Distribution of farmers' investments by age

Young entrepreneurial farmers face increased challenges. According to NOBEL Prize-winning professors Porter and Stinglitz, who dealt with it: "As a result of newness, the high level of uncertainty, customer confusion, and erratic quality, the emerging industry's image and credibility with the financial community may be poor" [15]. Especially in Greece and in the countries of the European South, investors face more problems. "The rich and well performing could invest in better schools and infrastructure. Their banks could lend more, making it easier for entrepreneurs to start a new business" [16]. The fact that the majority of farmers investing are young farmers under the age of 40 sends a promising message.

The following figures 11 & 12 show the distribution by age and by altitude and the percentage of young farmers.

As shown, the percentage of young farmers in lowland areas is higher.

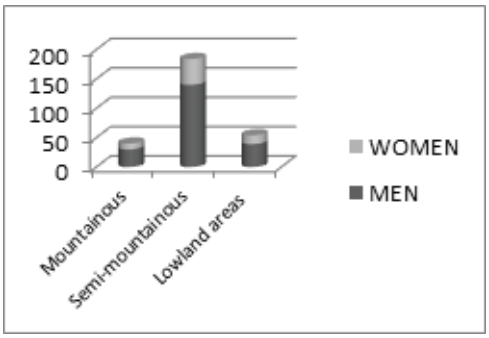

Figure 11: Distribution of farmers' investments by age depending on the altitude

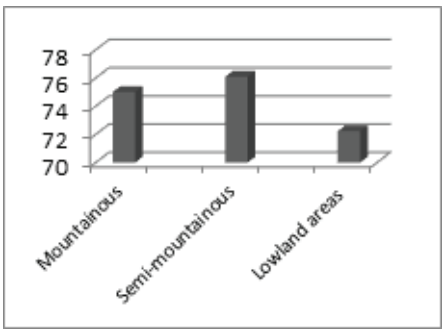

Figure 12: Percentages of farmers' investments by age

Finally, the examination concerned Measure 4.1.3 investments in Renewable Energy Sources (RES). Only 27 investors decided to take advantage of the measure to minimize energy costs by installing photovoltaic parks in fields with the net metering energy clearing process. It is worth noting that they also had the right to use virtual net metering. The majority take advantage of the measure to reduce the irrigation cost, and in very few cases 1-2, the measure concerns the energy of livestock facilities. Taking into account that in R.U. of Serres, private irrigation drillings consume large amounts of energy and that there are about 1000 private drillings, finally, very few farmers applied for inclusion in measure 4.1.3. Figure ?? below shows the distribution of just 27 photovoltaics depending on the altitude. The 26 investments are made in semi-mountainous areas, one in mountainous and none in the lowland. The vast majority of lowland areas are part of an organized public irrigation network and, there is no low-productivity land - a prerequisite for the installation of the park.

All the above are presented in Figure 13 below.

Finally, given that not one in ten farmers invest in RES, the widespread use of good environmental practices is questioned.

5. Conclusions

The current economic crisis could constitute a chance for setting a stricter and effective production system to contribute not only in alleviating short-term impacts of the economic crisis but also to help in the mid and long-term growth of the farms [17]. The recession afflicting the country harms its productive potential. In this environment of

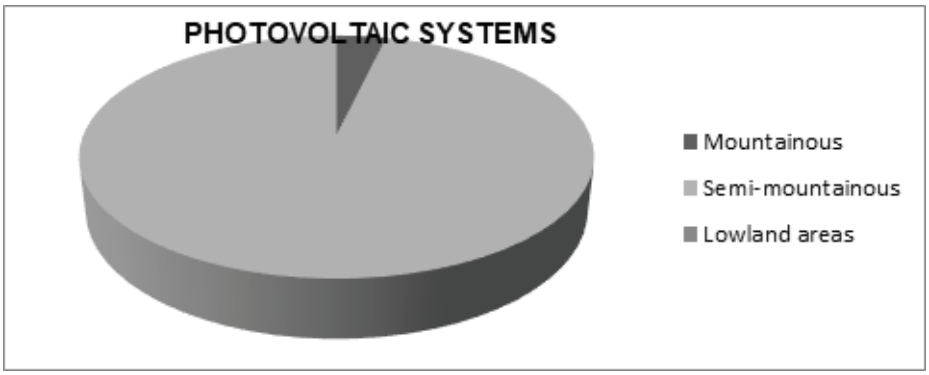

Figure 13: Distribution of photovoltaic parks per altitude

limited financial resources, the exploitation of European funds is helping to reverse the recession.

The main conclusion that emerges from our research is that interest in investing in the primary sector is particularly increased, especially among younger farmers. The increased rate of investment in the semi-mountainous areas with natural restrictions in the R.U. of Serres may be due to the additional aid received by farmers in these areas. Accordingly, farmers in mountainous areas intend to make more investments in proportion to their population. The fact that younger farmers under the age of 40 invest more than the older reinforce the renewal of the rural population. Investments in RES did not attract the interest of farmers as expected. Environmental awareness has not been acquired by such population groups yet.

The improvement of productivity and competitiveness are also affected by the philosophy of the business. Moreover, social capital plays a crucial role in the implementation of policies for rural development (Papageorgiou, 2015). Policymakers can use this paper to evaluate the planning process of the programs under the second pillar of CAP. Furthermore, it can be used to identify trends among farmers and their needs in investment plans.

The present research gives the impetus for the study of investments in the primary sector. The examination of the implementation of the program after the announcement of the results, which most probably will take place in autumn 2019, remains a challenge.

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