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DOMESTIC PROJECT: CHALLENGES AND STRATEGIES FOR THE SUSTAINABLE DEVELOPMENT OF THE PASTORAL AND RANGELAND SHEEP AND GOAT PRODUCTION SYSTEMS IN IPEIROS (EPIRUS) REGION IN GREECE

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Abstract: Case studies from four countries of the Mediterranean region (Greece, France, Cyprus and Morocco)are analysed in the frame of the DoMEsTIc project (ARIMNet initiative in EU 7th Framework Programme) in order to assess the associations between the structure of the farming systems and the characteristics of the local sheep and goat breeds with the sector's resilience and sustainability. Three main topics are investigated: i) livestock farming systems, ii) genetic management of the breeds, and iii) economical aspects. The project, still in progress, concluded with some first results regarding the case study in Epirus (GR) that are presented in this paper. The region of Ipeiros (Epirus) is considered as a Less Favoured Area (LFA) where small ruminant production consists one of the major sectors of economy and is mainly based on natural resources.
Data was collected through personal interviews with the farmers. The analysis of data (32 interviewed farmers) demonstrated that the main weaknesses of the sector, are considered the age of farmers and the lack of successors, the lack of commercialization strategies, certification and labelling and the lack of rational organisation of community pastures. In general, the farmers are willing to be engaged in a process that will allow them to sell their products at a higher price. The main strategy that all agree towards the sustainability of the sector, is the need to implement policies to improve the infrastructures in the mountain areas and to take support measures for low input farming systems.

Keywords: Sheep and goats, production systems, sustainability

Introduction

In the Mediterranean region, rangeland and pastoral systems, considered as the traditional way of farming, have been shaped over the centuries both by and for the specific conditions of the environment. In this context, knowledge systems and know-how have developed gradually by interacting to this particular environment *(Bouche, 2011)*. These systems contain elements that can be proved of high value under the new conditions, related with the need for the protection of the environment and biodiversity and with consumer demands on safe and quality products. The necessary evolution of the rangeland and pastoral systems refers to an overall adaptation of their components so that the production activities will provide sufficient income to the farmer in appreciable working and living conditions.All actions should clearly target the recognition of the profession in connection with the position of the farmer in the local communities, the economic, social and cultural sector *(Ligda et al., 2011; Tchakerian, 2007*).

The uniqueness of Mediterranean livestock products, appreciated by a wide range of consumers, and the contribution of the livestock systems to the maintenance of the natural environment as well as of the population in rural areas, are some of the strengths of these systems, which could provide an opportunity for their sustainability and development *(Belibasaki , 2012; Boyazoglu and Morahnt-Fehr, 2001; Casabianca, 2011; Casabianca and Matassino, 2006; da Gama, 2006; Sossidou et al., 2004; de Rancourt et al., 2006).*

The increased economic value will be achieved by higher selling prices but also with the better access to markets, either new ones or by securing access to existing through product differentiation. Mediterranean livestock production systems operate in an environment characterized by a high degree of dynamism and uncertainty. There is a significant rise in market pressure and competitiveness, which threaten the future and survival of the small ruminant sector in the region. Issues related with the loss of farm profitability resulting from an increased cost of inputs and declining meat and milk prices as well as the aging and shrinking farming population factors leading to a reduction of herds and farms, which in turn may worsen with a decrease in subsidies in the EU countries. This situation may also bring about serious social and environmental consequences as sheep and goats contribute to the conservation of harsh marginal areas and to the maintenance of rural livelihoods. On the other hand, in the countries of southern and eastern Mediterranean regions, small ruminant populations are increasing as a strategy to compensate the low productivity of local production systems, raising some environmental concerns because of overgrazing and consequent soil degradation and deforestation. It is therefore necessary to analyse the sustainability of sheep and goat production systems in the region, covering the economic, social and

environmental aspects, including their adaptive capacity to socioeconomic changes. At present, little research is reported in this area. In addition, methodologies of analysis that would enable a thorough understanding of the nature and complexity of the underlying factors are not readily available. Furthermore, climate change is likely to create a number of problems in many areas of animal husbandry (housing, fodder and water availability, disease challenge etc) and threaten the sustainability of many livestock production systems and their associated AnGR *(FAO, 2007).* Mediterranean livestock farming systems have adapted to these and have taken advantage of the diversity of lands that characterise the Mediterranean area, interacting strongly with the land and the environment. However, current knowledge is limited and additional research in this domain is required.

Case studies from four countries of the Mediterranean region (Greece, France, Cyprus and Morocco) are analysed in the frame of the DoMEsTIc project in order to assess the associations between the structure of the farming systems and the characteristics of the local sheep and goat breeds with the sector's resilience,competitiveness and sustainability. Three main topics are investigated: i) livestock farming systems, ii) genetic management of the breeds, and iii) economical aspects. The project is still on going and the data analysis is not completed; the objective of the presentarticle is to analyze the complexity of sheep and goat sector in Epirus and suggest the necessary strategies for the sustainable development of the sector.

Material and Methods

In Greece the field work was carried out in the region of Ipeiros, which is is considered as aLess Favoured Area (LFA) i.e. areas with a high agricultural potential but with limited access to infrastructure and markets, low population density, or other socioeconomic constraints. In the region small ruminant production consists one of the major sectors of economy and is mainly based on the natural resources of the area. In the mountainous and semi-mountainous regions, the sheep and goat production systems are based in grazing, in certain cases with transhumance, mainly in the mountainous zones. The sheep population presents high variation in morphology and production characteristics and shows excellent adaptability to the local environment *(Georgoudis et al., 2006; Hatziminaoglou, 2005; Ligda et al., 2009; Tzouramani et al., 2011; Belibasaki et al., 2012*).

The survey was conducted in collaboration with the Association of Pastoral Farmers of Epirus (EMKH) and focused to the three municipalities of Ioannina County, Ioannites, Metsovo and Pogoni with the highest concentration of sheep and goats farming. 73 farms have their main installation (winter) in the county of

Ioannina, from which 57 are located in the three municipalities mentioned above. From this selected area data were collected from 32 farms, with personal interviews with the farmers.

The questionnaire that was developed for the survey includesseveral sections covering the farmer's profile, the farm and the production system (including information on management, feeding, breeding and reproduction, health management), information on performance recording, the animal products and the economics of the farm. The last section was devoted to the challenges and strategies aiming to prioritize the challenges and threats to the sector and define the strategies that are needed to achieve the sustainability according the farmer's perception. The analysis of the data is still in progress and in this paper we focus on the last section of the questionnaire i.e. the challenges and strategies This section includes a list of parameters (possible threats and strategies) that the interviewed farmer had to rank from 1 to 5, according the importance of the specific parameter. The list has been designed in a way to be used for all four case studies that were included in DoMEsTIc project. In total 12 variables were included as threat parameters, and 7 variables in the strategies section. The list of variables is included in Table 1. The results that are discussed below include the preliminary statistical analysis of this section using SPSS ver.20 (IBM SPSS Statistics 20) and a SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) which is applied as a valuable adjunct to experimental research for it helps to organize the information and analyze the representation of physical processes(*Sossidou et al., 2007*).

Results and Discussion

Preceding the presentation and discussion of the SWOT analysis results, an overview of the current situation of the sector and a brief description of the production systemis provided. This description is based on the data collected during the survey, corresponding to other sections of the questionnaire. Sheep population in the region is consisted mainly with different crosses of local mountain sheep breeds among them, or in some cases with Chios, Lesvos, Karagouniko or Frizarta. There are few flocks with pure bred animals of the local sheep breeds of Katsika (Karamaniko), and Kalarritiko, which are considered endangered due and are included in situ conservation programmes. The main reason of farmers' preferences to the specific breeds or populations is their adaptation in the environment and the production system. A key difference is observed between farmers that raise the Katsika and Kalarritiko breeds, who express their strong belief on their breed's special characteristics, both in terms of phenotype, but also on their quality characteristics. In these cases heritage and

tradition is considered as an important factor for the choice of breeds, but also the incentives they receive for the loss of part of their expected income due to the smaller productvity.The goat population is considered as the local type of goats while there are also few herds with the Skopelos breed, Alpine, or Damascus. In the survey, seven farmers raise only goats, while 5 of them use autochthonous breeds, the local goat and one the Skopelos breed. In the majority of the sheep farms, goats are also raised together with the sheep flock.

The production system is based on grazing, either in the land around the farm, either rangelands or cultivated lands, and the community pastures. The land used for the sheep and goat farming varies throughout the year, as from middle June until the beginning of November, the flocks/herds move to the mountain pastures.

In general the management system is divided in 3 periods :

1. December until February : the animals are housed and complementary feeding is provided, forages and concentrates
2. March until May : the animals move to short distances and housed during the night. Grazing is the main feeding resource.
3. From end of May or June, until November : the animals move to the mountain pastures, more than 1200m. Feeding is exclusively based on grazing. The mountain pastures are mainly community lands and are divided in different parts for each farmer.

Milk production is the main source of income for sheep and goat farmers. The 75% of the milk production is directed to the principal dairy industry of the region DODONI (a cooperative until November 2012), while other small dairies receive smaller quantities. Milk is transformed to feta (PDO), kefalograviera (PDO), galotyri (PDO), other cheeses and yoghurt. Very few farmers produce dairy products on farm for direct selling, however all farmers produce cheese, yogurt and other products for self consumption. Regarding meat production, two main channels are described; the majority of the production is directed to the market through the wholesaler, while the remaining is sold directly to the consumer, or is self consummated. The percentages can vary between the farmers. The prices are unified in the region, formed by few actors.Although farmers have a high appreciation of their products, in most of the cases (only few exceptions) they do not have special agreements which differentiate the prices according to the quality, neither for meat or milk products. In general the farmers are willing to be engaged in a process that will allow them to sell their products at a higher price. There are some initiatives towards this direction, mainly for meat production.

The descriptive statistics analysis of the questionnaire revealed the following parameters as the most frequently reported threats for the sustainability of the sector: Aging of the farmers and lack of successor, the existence of

predators, the rational management of pasture lands and animal health and disease control (most frequent ranking of the threat is 5 in all four parameters). 45.2% of farmers consider as a major threat (rank 5) the aging of the farmers and the lack of successors, and about the same percent the existence of predators. Regarding the threats that are linked to the technical interventions (breeding and reproduction, feeding, health and disease control and management of pasture lands), despite the recognized need that these should be enhanced, only for the two of the variables, management of pasture landsand health and disease control the most common rank is 5, and in total 58% ranked the management of pasture lands as an important threat (4 or 5) and 44% of the farmers ranked the health and disease control as an important threat.

Regarding the strategies to be followed, these can be divided to the general policy measures that are necessary to ensure the sustainability of the sector and the specific interventions. According to this division, the policy measures to support promote extensive farming have been ranked as the most important priorities, with 95.8% of the farmers ranking this strategy as 4 or 5,the need to take measures to support and promote extensive farming, while 82% of the farmers consider as a first priority (5) (92.8% ranked as 4 and 5), the need for measures to improve the infrastructures in the mountainous areas. Certainly, this could mean that it was easier for the farmer to identify as a necessary strategy a general framework that would improve his conditions of working and living, which includes all measures from improvements on the installations in the summer pastures, the connecting roads and the communication and the technical support. The third strategy that was also ranked as an important priority, the improvement of support and advisory services (96% of the farmers ranked this variable as 4 or 5), followed by the development of market oriented policy (58% of the farmers, ranked as 4 or 5 this variable).On the other hand, it is observed that more specific policies regarding the differentiation of production, the support of other activities (as agrotourism) and consumer awareness, which will lead to the increase of value of the products and consequently to the sustainability of the production system, are ranked as medium priorities (mode value=3), mainly because the farmers considered that these measures, are included in the general strategies which currently are missing for the region and can be detailed and specified according to each case, provided that a healthy framework that promotes the extensive farming is being established. The results are presented in Table 1. Further analysis of the data will reveal the relationships between the different threat factors and the parameters of the production system.

Table 1. Descriptive statistics of threats and strategies						
	Number of replies	**mean**	**median**	**mode**	**Frequencies of**	
					5	**4**
Threats						
Age of farmers / Lack of successors	31	3.9	4	5	45.2	19.4
Limited availability of labor force	31	2.6	3	3	9.7	3.2
Breeding and Reproduction	30	2.4	2	2	20.0	3.3
Developing feeding program	30	2.3	2	2	10.0	6.7
Animal health and disease control	31	3.1	3	5	32.3	12.9
Rational management of pastures	31	3.3	4	5	19.4	38.7
Limited infrastructures f or processing	30	3.0	3	3	20.0	16.7
Limited infrastructures for slaughtering	30	2.9	3	4	3.3	43.3
Low promotion of labeled products	29	3.6	3	3	34.5	13.8
Long distances to markets	30	3.5	2	2	10.0	13.3
Changes in CAP	30	2.6	2	2	16.7	3.3
Predators	27	4.3	4	5	44.4	40.7
Strategies						
Marke toriented policy	24	3.7	4	5	37.5	20.8
Differentiation of production	24	3.7	3	3	33.3	12.5
Consumer awareness	24	3.5	3	3	20.8	25.0
Support extensive farming	24	4.5	5	5	58.3	37.5
Support and advisory services	26	4.6	5	5	50.0	46.2
Improve infrastructures	28	3.6	3	3	82.1	10.7
Other activities	24	3.0	3	3	25.0	20.8

In addition to the descriptive statistics, a SWOT analysis which is presented in Table 2, aimed to organize the different parameters and analyze the current situation of the sector in Ipeiros. The analysis was enriched with information from other stakeholders in the region.

Table 2. SWOT analysis of Ipeiros case study

STRENGHTS ▪ Rich biodiversity and natural environment ▪ Local farm animal breeds adapted to the environment ▪ Low input production systems ▪ Exploitation of pastures ▪ Unique flora that give special aromas to the agricultural products ▪ Highly appreciated by the consumers products (milk and meat)	**WEAKNESSES** ▪ Low population density – ageing of farmers – lack of successors ▪ Lack of appropriate breeding strategies ▪ Lack of rational organisation of community pastures ▪ Lack of organizations of professionals – and of co-operation between the competent authorities ▪ Lack of commercialization strategies - Limited access to markets and infrastructure – Lack of certification and labelling ▪ Lack of social services (education, health) ▪ Luck of integrated policies for the protection of the biodiversity ▪ Lack of vocational training ▪ Low agricultural output prices and market distortions
OPPORTUNITIES ▪ Improve the infrastructures in the mountainous areas ▪ Incorporate innovative methods in the traditional production systems ▪ Development of suitable breeding programmes ▪ Protection of the environment along with the implementation of good farming methods ▪ Implementation of integrated management system, improve farm animals' health and welfare ▪ Development of market oriented policies -Production of certified agricultural products ▪ Diversification of economic activities ▪ Co-operation between the different stakeholders	**THREATS** ▪ Depopulation of the areas and movement of livestock farming from the mountainous to plain zones ▪ Low productivity - Low income ▪ Lack of professional organisations ▪ Economic exclusion ▪ Social exclusion

Conclusion

The main weaknesses of the sector, according to the interviews, are considered the age of farmers and the lack of successors, the damages from the

predators, and the lack of technical support for the rational organisation of community pastures, and health and disease control. Although the lack of promotion strategies for certified and labelled products is not included in the most important threats, the need for such strategies has been identified and in general the farmers are willing to be engaged in such processes. The main strategy that all agree towards the sustainability of the sector, is the need to implement policies to improve the infrastructures in the mountain areas, take support measures for low input farming systems and enhance support and advisory services.

For the effective promotion of sustainable sheep and goat farming in LFAs of Ipeiros, policies can be summarized as following:

- Improving competitiveness of farming by developing infrastructure related to development of agriculture.
- Enhancing the professional organisation of farmers and the collective organisation.
- Encouraging the implementation of integrated strategies for sustainable development.
- Supporting farmers who participate in food quality schemes, animal welfare standards and agri-environment measures.
- Supporting the adaptation and modernization of education, training and employment systems to assist regions taking into account the general needs of areas facing structural difficulties with regard to economic and social conversion.

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DoMEsTIc projekat: izazovi i strategija za održivi razvoj ekstenuzivnih i pašnjačkih proizvodnih sistema u ovčarstvu i kozarstvu u region Epir u Grčkoj

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Rezime

Studije iz četiri zemlje regiona Mediterana (Grčka, Francuska, Kipar i Maroko) su analizirani u okviru DoMEsTIc projekta (ARIMNet inicijativa, 7. Okvirni program EU) u cilju procene veze između strukture poljoprivrednih sistema i karakteristike lokalnih rasa ovaca i koza sa stanovišta održivosti t sektora. Tri glavne teme su istraživane 1) sistemi u stočarstvu, 2) genetsko upravljanje rasama, i 3) ekonomski aspekti. Projekat je još u toku, a neki preliminarni rezultati u vezi sa studijom u Epiru (GR) su prikazani u ovom radu. Region Ipeiros (Epir) se smatra manje pogodnim područjem - Less Favoured Area (LFA), gde proizvodnja odnosno uzgoj malih preživara čini jedan od glavnih sektora ekonomije i uglavnom se zasniva na prirodnim resursima.

Podaci su prikupljeni putem ličnih razgovora sa poljoprivrednicima. Analiza podataka (32 intervjuisana poljoprivrednika) pokazala je da su glavne slabosti sektora starost poljoprivrednika i nedostatak naslednika, nedostatak strategije komercijalizacije, sertifikacije i obeležavanja proizvoda, i nedostatak racionalne organizacije zajednice pašnjaka. U principu, poljoprivrednici su spremni da se angažuju u procesu koji će im omogućiti da prodaju svoje proizvode po višoj ceni. Glavna strategija oko koje se svi slažu da će omogućiti stabilnost ovog sektora, jeste potreba da se sprovede politika za poboljšanje infrastrukture u planinskim oblastima i preduzmu mere podrške malim poljoprivrednim sistemima.

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