Research Paper Sustainable Development

Development of Semi-Mountainous Areas: A Pilot Study the Case Study of The Wider Region of Ancient Olympia

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ABSTRACT

The region of Ancient Olympia was one of the victims of the fires plagued Greece in 2007. The present study aims at: a) a brief illustration of the effects of the forest fires remained on the natural ecosystem of the semi- mountainous region of Ancient Olympia in 2013, b) a suggestion of measures required for the remedy of the environmental damages as well as for the development of the area. Prerequisite for the implementation of the measures is the accurate examination of the technical, ecological and cultural environment of the area. Any action taken to address the harm caused by the fires, contributing simultaneously to the rational environmental development of the primary, secondary and tertiary production of the area, should be applicable, offered in accordance with the natural and the increased historical importance specificity of the region. The financing potential of the area and the social feasibility of the suggested measures are also determining factors taken into consideration for the structure of a protection and development plan of the region.

KEYWORDS forest fire, life quality, developmental politics

1. Introduction

Agriculture, livestock and forestry in semi-mountainous areas have always been closely interdependent. The phenomenon of deforestation for agricultural use was observed in the last years and it resulted in the creation of small farms located on slopes with relatively high inclination and altitude. Today, the gradual abandonment of traditional farming methods of ruminants and in particular the abandonment of the nomadic way of farming and the consequent movement restriction of herds, has the effect of reduction of stocking density of meadows, the increased risk of forest fires and the provocation of severe soil erosion problems (Michailidou, Rokos, 2010).

Preventive measures for forest fires should be taken in order to raise consciousness regarding the require of a self – protection of forest areas. Therefore, the desideratum arising after a forest fire is the application of such precautionary measures in conjunction with renovation – restoration – development of the plagued area.

The area of Ancient Olympia was seriously affected by the forest fires, which took place in Greece in 2007.The fire threatened the sacred site of Ancient Olympia, incoming from the semi-mountainous forest area.

This paper examines which development measures should be implemented in the semi – mountainous region of Ancient Olympia, in order to achieve the rational environmental development of the primary, secondary and tertiary production of the area.

2. Research area

The definition of a semi-mountainous area varies depending on whether we consider the settlement or space, or both of them (Dafis 1973; Psychoudakis 1997).

A mountainous forest area in the context of spatial planning and forestry terms is considered as the region at altitudes higher than 250-300 and lower than 650 – 700 meters on the slopes or on steeply sloping ground (mean slope 10-20%), located in the vegetation zone of oak - chestnut - Aleppo pine, Trachea pine (*Quercion ilicis-confertae, Castanea vesca, Pinus chalepensis, Pinus brutia*).

The surrounding semi-mountainous area of Ancient Olympia includes the following municipal departments of the municipality (Figure ...), which form also the research area:

- Vasilaki which includes the village Ypsilo
- Kafkonia
- Kryoneri
- Xirokampos which includes the village Ampari
- Pefkes
- Helidoni

Figure 1 indicates a satellite image of Ancient Olympia and the semi-mountainous area that surrounds it.

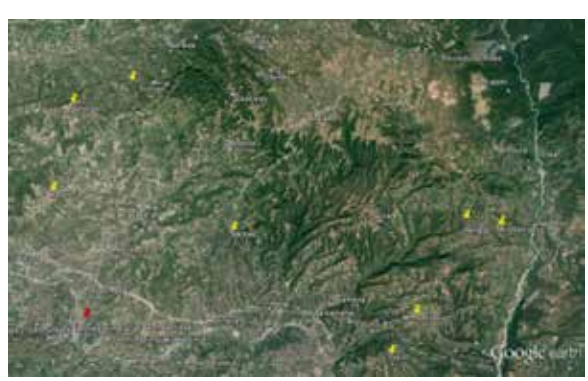

Figure 1. Villages (settlements) of the semi-mountainous wider area of Ancient Olympia

3. Development physiognomy (Parameters, status quo)

Most people in the research region work in the primary sector except from the villages Vasilaki and Pefkes (Figures 2, 3 and 4) and also in the tertiary sector.



Figure 2. Aerial photo, showing the rural forest character of Vasilaki area



Figure 3. Aerial photo, showing the rural forest character of Kafkonia region



Figure 4. Aerial photo, showing the rural forest character of the areas Ampari, Xirokampos, Neochori (from left to right)

3.1. Primary production
3.1.1. Agriculture
The permanent grasslands are few, they almost don't exist. This observation reflects the fact that the fields are fertile enough, so that they can almost entirely be cultivated by the residents. Consequently, agriculture is the main activity of the inhabitants working in the primary sector (Figures 2, 3 and 4).

According to 2004 annual agricultural statistic research, the dominant products of the region are cereals and forage plants for greens and rhizomes. In the region there are also a lot of vineyards destined for wine production. However, dominant cultivation of the area is olive groves produced for oil extraction.

The implemented cultivation methods are characterized as traditional. This "tradition" in the field of cultivation is attributed to the low educational level of farmers, which combined with the significant lack of awareness and professional training complicates the adoption of modern farming techniques by them. And this happens despite the existence of considerable funding community programs concerning farmers and livestock breeders' education.

The outcome of this situation is the low productivity of the crop production sector and the existence of small yields per acre of crops. Still, the lack of mechanization of livestock sectors, the small lots, the excessive use of fertilizers and pesticides, the empirical farm management and the inability of farmers - breeders to operate as entrepreneurs are some of the main features of agricultural activity that contribute to the formation of low incomes.

3.1.2. Livestock
Livestock production is an activity heavily involved in shaping the local farmers income.

The activity of livestock is practiced in a traditional way and the products are being sold without being processed. The dominated activity in the field of livestock production of the region is the rearing of lambs, goats, annual sheep and poultry, which is traditional for every rural family and covers part of daily nutritional needs in eggs and meat. The housing of farmed sheep and goats is made in traditional sheepfolds and is rudimentary. The animals are mainly fed on private pastures. The veterinary coverage is insufficient.

3.2. Secondary sector
The secondary sector in the region almost doesn't exist, as already mentioned. In the research area no artisanal and industrial enterprises operate. A key finding is that funding programs failed to be exploited in the area in the last five years.

The brief conclusions made from the analysis of the collected data referring the secondary sector are:

- The secondary sector in the research area almost doesn't exist.
- The problem of the absolute absence of investment interest in the region is attributed to the lack of active manpower. The cause of such a lack of active work force is credited to the abandonment of the area by dynamic residents, who prefer to move to places, where better employment perspectives are offered. Moreover, the current population of the area will hardly take the risk to perform investment activities due to the lack of sufficient knowledge and investment capacity.
- However, absolutely dissuasive is the great age of the residents and the few funds available by them.
- The development of the secondary sector presupposes the maturity of a certified qualitative primary production, which will provide with a basis for the manufacture of products, whose competitive advantage will be the quality and not the low price as it occurs until today.
- The hope for establishment of an investor sentiment comes from voters wishing to exercise their electoral rights in a different municipality or community from the one, in which their electoral rolls are registered. They have the knowledge, own capitals and are willing to invest in their homeland.

3.3. Tertiary sector (Tertiary production refers to provided services such as trade, health, education, transport, tourism).

Public services in the research area almost don't exist. From

the analysis of the collected data regarding the tertiary sector, we came up to the following conclusions:

- Trade and services is a totally undeveloped field, because the areas are situated at a short distance from the urban centers, which absorb all commercial traffic.
- In all branches of the tertiary sector the enterprises are small and they operate complementary to other agricultural and livestock production activities.
- It goes without saying that there is no mass tourism in the region.
- The rate of unemployed young people in the region is extremely high. The young men and women in the region are not interested in working in the domain of traditional agriculture and animal husbandry.
- Although there are a lot of opportunities in agriculture, livestock and other activities, they are not been exploited by young inhabitants of the region, who seek their fortune in urban centers. The primary sector releases labor force, which is unable to work in the undeveloped secondary and tertiary sector. As a result, this labor force remains unemployed and finally leaves the area.
- As far as the male population is considered, it is found out that young men remaining in the area, try to revitalise their agricultural and livestock holdings. However, these, following the requirements of modern society, finally leave the area due to the easy access to the center of the prefecture. Moreover, they can't find a spouse, as young women also abandon the area, after leaving school. Specific incentives supporting the female employment and entrepreneurship are a prerequisite for the remedy of population balance.
- It is known that the structure of agricultural holdings in Greece is problematic due to objective reasons (intense and rapidly alternating relief, fragmentation and wide dispersion of unit ownership and land use). The middle size of the structure of agricultural holdings in semi mountainous areas is still below the extremely low national average. The farmlands are gradually being abandoned and the ageing index of the Heads of holdings is significantly higher than in other regions.
- Several measures were implemented in order to address the problem of abandonment of the semi – mountainous areas and to develop simultaneously the upland areas. Such measures were: a) compensatory allowances aimed at a counterbalance of low producers incomes attributed to physical constraints of the cultivated areas, b) increased incentives offered to young farmers in semi-mountainous areas and c) increased aids and subsidies for the development of businesses in the semi - mountainous and less - favoured areas. However, these measures helped people only to survive. They didn't contribute to the development of the area. The expansion of farmers' activities in other sectors should be encouraged, such as in the small artisanal and industrial companies. Particular emphasis should be placed on dairy production and cheese products (characteristic of modern policy guidelines and strategies, which tend to connect primary, secondary and tertiary sector).

3.3.1. Technical environment (Services - Infrastructure)

Social services (education, health) are offered in big villages like Vasilaki and the Helidoni, while the rest of the semi-mountainous villages find these services either in the capital of the municipality or in the capital of the prefecture. A large percentage of illiterate people are mainly older. Regarding the possibilities of education, in municipality of Vasilaki operates one elementary school, one secondary school and one high school. There is no support in the area for education offered by private entities (tutorial). However, in the region operates a school of foreign languages. As a result, only a limited number of students are being accepted by the Technical Schools and Universities of the country. Many students do not continue their education in a secondary school. The low level of education available in the region is one of the major factors of the abandonment of the area by young couples with children, which are students. According to findings coming out from a qualitative research of a discussion group, they actually don't leave the area due to economic reasons, but in order to live in an urban environment and to offer their children a better education.

The migration of well – educated workforce is the most important problem as the local community loses the most active and dynamic of its members, which could provide the region with growth prospects. Projects funded by European programs are not enough for the construction of infrastructures in a semi-mountainous region. The roads have been laid out with serpentines, turns, small width and steep gradients and they obviously require a new design and technical works (Figure 5), road subsidence in Helidoni (Figure 5).



Figure 5. Pavement in poor condition leading to Helidoni and the lack of geometry in semi-mountainous road network

The architecture of the semi mountainous villages does not meet the requirements of the traditional architecture in order to contribute to the development of alternative tourism.

3.3.2. Ecological environment

In the semi mountainous area of the research villages from the aerial photos (Figures 1, 2 and 3) seems their rural forest nature. The fauna and flora compose a unique natural environment which can be exploitable in terms of tourism development. Despite the revegetation of the burnt pine forest, its protection requires the introduction of more systematic preventive measures (Figures 6, 7).



Figure 6. Interesting geological formations and revegetation of burned pine trees after six years (2007-2013) on the way to Helidoni



Figure 7. (a) The fire guardhouse without an observer (August 2013) and without cameras, located between the villages Helidoni, Kryoneri and Kafkonia (b) revegetation of pines six years after the fire of 2007

3.3.3. Cultural environment

The historical and cultural development of the semi mountainous region is directly related to the historical context of the wider area, particularly of Ancient Olympia, whose historical context is well known. The oldest axe (pelekys) referred to prehistoric times and kept in the Museum of Ancient Olympia was found in Schinos, a place situated in the southeast of Xirokambos and at a distance of 3 km from it.

According to residents' testimonies, other findings were also investigated in the area, but no organized excavation took place, in order to enrich the information regarding the historical development of the region. In light of testimonies, during the time of the Ottoman Empire, the settlement Ampari was used by the Turks for storage purposes due to the existence of caves in the area. "Ampari" means in Greek a storage area and it origins from the usage purpose of the settlement, as already mentioned. This is evidenced by the existence of old olive trees on arable land of the village. At that time Xirokampos had not appeared as a settlement.

However, the modern settlement of Xirokampos appeared around 1880 and was inhabited by nomads, coming from the mountainous areas of Nemoutas, located in the north of the modern settlement. The name of the settlement is connected to the fact that it has a flat terrain and therefore no water source had been detected there before4

4. Suggestions of Measures

The following propositions are compatible with terms established by relevant projects and studies undertaken for the prefecture of Ilia (Open cities, 2008).

The proposing measures for the aforesaid semi mountainous areas are based on the following criteria (Doucas, 2004; Steinmüller, Stampfer, 2004):

- Decentralized tourism throughout the year.
- Alternative Tourism (sport, cultural, medicinal, ecological tourism).
- Infrastructure (works, energy, health).
- Alternative crops and traditional local products.
- Employment (support of young farmers, immigration policy).
- Traditional Architecture (reconstruction).
- Mild interventions in the natural environment by undertaking a small number of large investments but only in terms of an environmental impact assessment with standard environmental commitments.

The development of a certified quality primary production will be the background for the development of the secondary sector. The competitive advantage of these products will not be anymore the low price, as is done till today, but the quality. Due to the interrelation between the two sectors, our proposals for both of them are common.

4.1. Primary - Secondary Production

4.1.1. Works / Interventions for the modernization of farms

- Recording and delimitation of farmland and classification of a 'medium' and 'high' productivity agricultural land. Agricultural land is a natural resource that needs to be protected. Every change in use of it should be prevented. The construction of small irrigation networks, the implementation of environmentally sound cultivation techniques (cross-compliance), the application of land consolidation are interventions that contribute to the protection of farmland, prevent its abandonment and ensure its sustainable exploitation.
- Recording and delimitation of pastures.
- Reinforcement of natural revegetation and suitable seed mixtures of plants that will restore and enhance the required biodiversity.
- Support vegetation by using suitable fertilization.
- Application of projects for controlled grazing and grazing pressure.
- Restoration of the existing infrastructure and provision the pastures with an additional basic technical infrastructure (road building, construction of shelters, drinking troughs, etc.)
- Improvement of the age composition of the Heads of farms, by promoting young people to work in the primary production.
- Implementation of farmers' employment program in reforestation in order to support their income.
- Trees planting and environmental restoration works targeted at avoiding the aging of the rural population and the abandonment of the areas and simultaneously rehabilitating the natural environment.
- Disciplined immigration policy of agricultural labor manpower.

4.1.2. Works / Interventions aimed at a rehabilitation of the traditional crops in the region (Plantations of olive groves and vineyards) and restructure of crops

- Replanting olive groves and remedying the damage caused to them. Specifically, our propositions depending on the extension of damage caused to olive trees are the following:

a) Burned olive trees: Partial pruning of the crown of them, planned to be made if the damage caused is small.
b) Moderate burnt olive trees: Renewal pruning on the arms or on the trunk of them.
c) Olive trees with severe damage: Either replacement of them (with supply of healthy and certified material of local varieties) or pollarding them in stem height and vaccination (this suggestion refers to olive trees grafted on wild olive).

- Development of Biological Agriculture

- Biological Agriculture is the agriculture performed in a way that secures sustainable social well - being, environmental welfare and prosperity by minimizing the use of external inputs and maximizing the use of renewable resources. The conversion of a part of the restored and new vineyards and olive groves into biologic, differentiates importantly the cultivation techniques in the production of competitive products with high quality standards. These products are requested more and more by consumers.
- The replanting of damaged vineyards (depending on the extent and degree of the damage caused to stumps) can be achieved either by the implementation of total replanting of vineyards (using an identified, genuine and healthy propagating material, choosing the most desired clones among the recommended and authorized for the region of vine varieties and applying new formation techniques of stumps and vineyard structures), or by adopting the appropriate management of stumps during the winter pruning.
- Extension of outdoor horticultural cultivation with respect to the codes of appropriate agricultural practice and cross compliance rules (limitation of the used inputs, rational irrigation etc.) in order to produce quality products.

- Extension of the offseason horticultural cultivation in modern greenhouses.

4.1.3. Works / Interventions in livestock
- Support the livestock in the area, based on sheep and goat farming, by cultivating grassland plants and producing forage that will meet the nutritional requirements of livestock production in the region to the extent that they were covered by grazing.
- Replacement of lost sheep and goats with introduced new animals of Greek high yielding breeds originated from the best herds in the wider region.
- Application of a program for electrification of agricultural and livestock holdings. Existing holdings are by 60% non - electrified. Holdings have to be modernised, subsidized by 80%, new opportunities have to be exploited.
- Promotion program for biologic livestock farming. An available European Union program demands participation less than 2% of national funds. Biologic agriculture is the instrument that ensures the protection of the environment, the production of safe products and consequently the consumer's health. However, prerequisites for the application of the program are: a) the integration of the cultivators in a special register and b) the introduction of specific measures aimed at a reinforcement of biologic farmers undertaken in the context of a program for young farmers.

4.1.4. Land improvements
- Construction of at least two (2) reservoirs in appropriate locations, the water of which will be used for the irrigation of adjacent crops and in exceptional cases also for fire fighting.
- Construction of small irrigation networks that will serve 10000-15000 acres that aim at: a) a better utilization of the cultivated farmland, b) an improvement of the efficiency of crop yields by ensuring the irrigation completeness and c) a reduction of the increased percentage of land lying fallow. Moreover, the construction of small irrigation networks will reduce the water extractions from the several drillings operating in the region.
- Integrated management program of water resources - drillings - climate change.

4.1.5. Works / Interventions in the realm of spatial organization
- Siting of livestock farming activity and institutionalization of areas, in which "livestock parks" with small capacity (10-20 farmers, with 100-200 sheep each) will be installed.
- Delimitation and institutionalization of areas, in which modern holdings with greenhouses will be installed. This action targets at an all year round production of horticultural products, which will be exported.
- Improvement of the access to agricultural and livestock holdings by repairing - opening - widening suitable rural roads or reconstructing the poor conditions and incomplete geometric characteristics of the existing rural roads.
- Drawing up an integrated reparcelling - program of Plateau areas. Plateaus having good quality soils and extensive fragmentation of land and non-existent irrigation infrastructure, don't contribute to a qualitative and quantitative improvement of the holdings. Enlargement of the agricultural lot and more effective utilization of land is the optimum solution.

4.1.6. Works / Interventions for restoration of the damaged forest areas

Key interventions to restore the damaged forest areas are:
- Delimitation of the forest areas, related to the protection of burned natural areas by transgressions (Cadastre and forest registry).
- Improvement of the access conditions to woodlands by opening new and rehabilitating the existing forest roads, creating firebreaks, installing fire lookout stations etc.
- Protecting the natural regeneration from the animals grazing within designated forest areas.
- Works / interventions in order to create the necessary infrastructures promoting the processing and marketing of agricultural products.
- Installation of a standardization - packaging unit of horticultural products produced outdoors or in greenhouses.
- Modernization and relocation / merger of oil mills.
- Establishment of a standardization and packaging plant of olive oil.

4.1.7. Development of agrotourism activities
- Creation of agrotourism accommodations and visited farms (Rooms in rural homes, where the rural household and agricultural holding can offer tourists rural life experiences).
- Development of cottage industry activities (production of traditional sweets, handicrafts, etc.).
- Construction of organized recreation – sport - promenade areas, suitable also for other accompanying activities (e.g. hiking, climbing, etc.).
- Promotion of sports tourism (e.g. conducting bicycle and motorcycle racing).
- Construction of traditional guesthouses.
- Highlighting of hiking trails in the canyons.
- Creation of cultural and historical routes.
- Creation of a natural park which operates as an open system of Anthropogeography.
- Promotion of eco-tourism.
- Creation of a cycling routes network.
- Enhancement and organization of local regional tourism routes based on thematically organized cultural activities around the selected cities – road nodes of the network.
- Enhancement of monuments and archaeological sites in modern and well organized poles of attraction of the visitors.
- Conservation and restoration of sites aimed at a reopening and a development of modern cultural activities in them.
- The publication of a modern Tourist Guide.
- Utilization of particular cultural and natural assets.
- Revival and promotion of traditional and other events of the prefecture.
- Design of leisurely walk areas, view points and recreation areas.
- Creation of tourist kiosks.
- Construction of bird observatories.
- Utilization of archaeological, historical sites and of the traditional environment in order to promote educational, cultural, congress, eco-tourism and agrotourism.

4.2. Tertiary Production (Tertiary production refers to services such as trade, health, education, transport, tourism).

The tertiary production of the semi mountainous areas is connected to the development of the wider area of Ancient Olympia. However, from this point of view, the emphasis should be placed on the stay of visitors in the area and not only on a daily visit to the archaeological site.

5. Conclusions
- The area of Ancient Olympia on account of its archaeological value, has relatively comparative advantages to maximize the efficiency of the projects affected by its position. Meantime, it offers specific additional advantages conjoined with the dynamism of human factor and the specific features of natural, man - made and cultural environment. These advantages allow the development of multi activities as well as the implementation of projects. A proper exploitation of the aforesaid benefits of the region will improve the economy and the quality of life. Furthermore, an environmental dimension should be necessarily attributed to this framework for the development of the region. This means that the natural as well as the cultural environment need to be protected as an ongoing capital.
- The mobilization of all productive resources should be done in a way that will allow a grid – function of new and old works. One work will complete the other (where possible) and all works together will construct a grid operating

in multiply ways and contributing to the improvement of local economy and quality of life.
- The correlation between these projects is prerequisite for the achievement of the desired targets at a satisfactory degree. Meanwhile, the coordination and support by relevant bodies and infrastructures is also a precondition.
- The creation of developmental cores enables the use of the comparative advantages of the region, especially if the alternative forms of tourism will be combined with local production activities.

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