

RURAL ENVIRONMENTAL MANAGEMENT IN GREECE AS A CULTURAL FRONTIER BETWEEN THE "OCCIDENT" AND THE "ORIENT"

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RESUMEN: Grecia, en el extremo sur de la provincia de los Balcanes, es cultural y biogeográficamente una zona de transición entre el "este" y el "oeste". Algunos de los estilos tradicionales agrarios están considerados ejemplos típicos de un "estilo de producción oriental". En el Estado de Grecia, estos estilos de producción agraria están considerados como "caducados" y "fuera de sitio" en el contexto de la transformación radical de la producción agraria y del paisaje rural fruto de la intensificación de la agricultura y la modernización de la sociedad rural, unos procesos que se establecen hacia 1970 y se aceleran después del acceso a la UE. Sólo recientemente, algunas de las características de los antiguos sistemas agrarios son reevaluadas, a la luz de los negativos impactos ambientales de algunos modernos estilos agrarios. En este artículo, el paisaje rural de Grecia todavía se presenta en relación a los estilos agrarios que lo han formado, tanto "tradicional" como "moderno". Algunos de los cambios más importantes son discutidos en el marco de una gestión ambiental, mediante algunos ejemplos clave: gestión forestal y laboreo en las montañas, cultivos mixtos y olivar en las islas y sur de Grecia; y tierras de labor en las llanuras. Este artículo presenta los impactos ambientales y visuales de los cambios en los estilos agrarios y discute brevemente posibles tendencias futuras. Los impactos son evaluados mediante trabajo empírico, especialmente en el caso de los paisajes de cultivos mixtos y olivar y por la literatura. Las conclusiones indican que los estilos agrarios "tradicionales" suponen impactos ambientales positivos comparados con los "modernos" y actualmente algunas de sus características pueden ser usadas para la gestión sostenible del paisaje rural.

PALABRAS CLAVE: Paisaje rural, gestión ambiental, Grecia.

LA GESTIÓN DEL MEDIOAMBIENTE RURAL EN GRECIA COMO UNA FRONTERA CULTURAL ENTRE EL «OCCIDENTE» Y EL «ORIENTE»

ABSTRACT: Greece, in the southern tip of the Balkan Peninsula, is biogeographically and culturally a transition zone between the "east" and the "west". Some of the older farming styles in it were considered as typical examples of an "oriental production style". In the Greek state, these farming styles were considered as "outdated" and "backward" and the radical transformation of farming and the rural landscape was sought through intensification of agriculture and modernization of the rural society, a target accomplished by the 1970s and strengthened after the accession in the EU. Only recently, some of the features of older farming systems were reevaluated, in the light of negative environmental impacts of some modern farming styles. In this paper, the rural landscapes of Greece today are presented with a mention of the farming styles that have formed them, both "traditional" and "modern". Some of the most important changes are discussed in an environmental management light via some examples: grazing management and forestry in the mountains; mixed and olive cultivation on the islands and southern Greece; and arable farming in the plains. The paper focuses on the visual and the environmental impacts of farming styles changes and briefly discusses possible future trends. The impacts are evaluated by empirical work, especially for the mixed farming and olive cultivation landscape and by the literature. The findings indicate that "traditional" farming styles did indeed have positive environmental impacts compared to "modern" ones and today some of their features could be used for sustainable rural landscape management.

KEY WORDS: Rural landscape; environmental management; Greece.

1. INTRODUCTION: THE RURAL LANDSCAPES OF GREECE AS A CULTURAL FRONTIER BETWEEN THE "OCCIDENT" AND THE "ORIENT"

Greece, in the southern tip of the Balkan Peninsula, is biogeographically and culturally a transition zone between the "east" and the "west". Biogeographically, its Mediterranean

climate shifts from sub-tropical, in parts of the South Islands, to continental in the North. This climate combined with the hilly relief and the many islands creates a diverse set of habitats, with noticeable differences from North to South and from West to East, namely more arid ecosystems, less forest and more savanna-type ecosystems, following the precipitation differences (Grove and Rackham, 2002).

Moreover, the location of Greece serves as a meeting point for African, Asian and European species (Allen, 2001). Notwithstanding these natural characteristics, the presence of many different cultivation cultures since the Neolithic has lead into the introduction of many cultivated (now or in the past) species from both the west and the east. As a result, some of the species and the landscapes encountered in Greece today are characteristic of "Occidental" or "Oriental" landscapes. Typical examples include the scrub landscapes of Southern Greece and the smaller islands that resemble Levant, Anatolia and Sahel landscapes; the oak savannas of South Greece that are close to *dehesa* and *montado* landscapes; and the beech and alpine landscapes of North Greece that are alike the South Alps.

Culturally, before the establishment of the Greek State in 1826, Greece was part of the Ottoman Empire. Therefore, some of the dominant farming styles until the early and middle 20th century were considered as typical examples of an "oriental production style" (Vergopoulos, 1975; Mouzelis, 1978). The most important characteristics of this "style" are an alleged tendency of farm households towards self-sufficiency and not towards the market (Vergopoulos, 1975). This tendency was combined with a lack of entrepreneur spirit, in the sense that such farm households were reluctant to change and adapt to markets and innovate their production styles and management regimes.

Already in the late 19th century, this "Oriental style of production" and the management systems linked with it were regarded as outdated and backward and as an obstacle and a sign of "delay" in the attempt of the Greek State to modernise agriculture. Other voices (Karavidas, 1924/1978) were not heard in the general urge to transform rural Greece and Greek agriculture. So, the modernization attempt was ignited and lead by the paradigms of "Western agriculture" and the State's organization in general. It should be clarified at this point that the term "Western" here refers to the opposite of the "Eastern" - the "Oriental" and corresponds to modern agricultural systems. Therefore, the distinction between the "orient" and the "occident" in terms of farming systems and landscapes refers to the distinction between the "traditional" and the "modern" that took place in other places of the Mediterranean as well. The difference is that in the Greek case discussed here, "modern" systems were named and considered as "Western" as an ideological and political distinction with

older systems that were linked with "Oriental" Ottoman Greece. This paradigm of modernisation aimed at farmers - entrepreneurs that would be able to utilise modern cultivation techniques, scientific advice from agronomists and machinery to produce enough to cover domestic needs, provide raw material for the agri-food industry and export. Towards this goal, the agrarian reform that was completed in 1932 was envisaged as a means of creating many small owners from which the "new" Greek agriculture would be created¹ (Vergopoulos, 1975).

The modernisation of cultivation techniques and the mechanisation of agriculture targets were accomplished by the 1970s (Moisides, 1986) for the fertile areas that could be irrigated. But, the target of transforming Greek rural society in favour of farmers - entrepreneurs was not reached, for a number of reasons. First, farms were not big enough in most cases and members of the household, including the farmer, had to seek incomes from other sources. Second, farming was not considered as a prestigious activity but as an unattractive occupation (Gidarakou, 1999) and young people migrated to the urban centres. Third, for many farm households, being a farmer is not an occupation like others but a social condition (Damianakos, 2002) and some households still consider themselves as "farmers" despite earning their living mostly from off farm occupations.

Another set of reasons is related with the areas in which intensification and mechanisation was not possible, namely the mountainous areas and the islands, especially smaller ones. In these Less Favoured Areas (LFAs), the modern "western" agriculture of the plains was either not applicable at all; or relied too much on imported and costly input. In this setting, farming was left to old people, part timers and only sheep husbandry was still a profitable farming option. Farming was therefore marginalised and either the areas were abandoned (e.g. in some mountainous areas), or new activities emerged (e.g. tourism on the islands). These areas emerge today as a heritage tank of traditional farming styles, reminiscent of the "orient", rather than the "occident".

The accession in the EU in 1981 and the Common Market mechanisms completed the transition to "western" farming management systems. New cultivations emerged and some farmers flourished financially by the heavy subsidies (e.g. in cotton and peach cultivation). Some farmers - en-

trepreneurs were eventually created, but their "entrepreneur spirit" was targeted towards subsidies and not the markets. Rural development measures on the other hand, were not particularly successful, except equipment subsidies and compensatory payments in LFAs. The gradual change of the Common Agricultural Policy (CAP) in favour of the so-called "Second Pillar" measures until the ongoing decoupling of production and subsidies, unveiled the crisis of this subsidy-driven farming style.

This recent crisis coincided with the gradual re-evaluation of some of the features of older farming systems for their environmental impacts, in the light of the increasing negative environmental impacts of some of the most spread modern farming styles. This re-evaluation is grounded on the growing concern that modern - "western" farming systems may not be completely suitable for producing safe and quality products, while protecting and preserving natural resources and the rural landscape in a countryside with multifunctional farm households. On the contrary, some of the former traditional - "oriental" farming systems, perhaps transformed, may be of more use for a strategy to achieve this overall goal of both the EU and national authorities.

The rural landscapes of Greece today are complex and changing. In this paper, a few rough types are presented, using geographical and land use criteria. Afterwards, some of the most important changes are discussed in an environmental management light via three examples of very important rural landscapes: grazing management and forestry in the mountains; mixed and olive cultivation on the islands and southern Greece and arable farming in the plains. The discussion focuses on the farming styles that have formed them, traditional and modern, and some important changes. The visual and the environmental impacts of these farming styles changes on the landscapes are presented and some future trends are briefly discussed. The data come from the literature and from empirical work on some of these systems, especially mixed farming and olive cultivation.

2. A HISTORY AND TYPOLOGY OF GREEK RURAL LANDSCAPES

Coherent typologies of Greek rural landscapes are rare in the literature. The few existing ones are either focused

on land uses or rely on agricultural statistics and farm characteristics. The ones focused on land uses result in five broad types that are further sub-divided into more categories. The broad types include forests; agricultural land; grazing lands; wetlands and other areas (settlements, rocks, barren land, etc.). Although such a typology may be useful in terms of describing these landscapes, they are too broad and lack specific spatial and productive criteria and exclude landscape elements. The typologies that rely on farm characteristics focus either on spatial criteria (Anthopoulou, 2001), on combinations of spatial and productive criteria (Moisidis, 1986; Karanikolas and Martinos, 1999), or on productive criteria alone (Damianos and Skuras, 1996). These typologies may be adequate for obtaining useful information about farm land uses or farm types, but fail to capture convincingly the diversity of farm structures and landscapes.

Historically, the Greek landscape was physically and geomorphologically established with the consolidation of the coastline about 9,000 years ago, when the Aegean Sea, after millennia of sea-level change, assumed its present configuration. Roughly after this time, human intervention has been altering the landscape. Mesolithic evidence on the fertile plains of eastern central Greece reveals cultivation of cereals and pulses and sheep and goat remains appear in the early Neolithic (7,000 BC) from stocks that herders brought with them from the East (Halstead, 1996). On the islands, signs of considerable human presence are rare before the end of the Neolithic (4,000 BC) and in the uplands extended human landscapes are recorded even later (2,000 BC) (Halstead, 1996). The evidence draws a picture of mixed cereal and pulses cultivation system, closer to horticulture than to typical arable cultivation, due to lack of ploughs; sheep and goats are raised in rangelands and the typical settlements are small, of 50 to 300 people (Halstead, 1996).

Only after the beginning of the 2nd Millennium BC practices change and the familiar Mediterranean agriculture landscape is shaped. Ploughs and animal traction are two key developments in this process from Neolithic farmers to a monetised and urban society of the last centuries BC. This process is not linear and periods of cultivation growth and abatement following population rise and decline are common (van Andel and Runnels, 1987). The three most important systems shaped are

typical of the whole Mediterranean: cereal cultivation (one year ploughing and with one year fallow with grazing); olive trees and vineyards cultivation; and animal husbandry on barren land and land that is not suitable for other cultivations, with periodic movements of the herds (Braudel, 1993; Halstead, 1996). Already from 1,500 BC onwards the landscape is human, with terraces, irrigation networks, small cultivated fields, grazing animals, managed forests and rural settlements alongside the growing cities (Jameson *et al.*, 1994; Grove and Rackham, 2002). The extend of the cultivated area is striking in some thoroughly studied cases, with the population of the late Hellenistic and Roman periods reaching numbers that will be reached again in the 19th century (Jameson *et al.*, 1994).

The Roman era brought further commercial development based on food products that had to feed the growing cities (Avramea, 2002). It also brought new tools, plants and management techniques that stayed in use for many centuries. Open landscapes of cereal cultivation, terraces expansion (Foxhall, 1996), new water management techniques and three year fallow systems are some of the changes that formed the typical Roman Mediterranean landscape (Horden and Purcell, 2000). The Byzantine era (7th to 13th century) marks the decline of population and cultivated land, especially commercial plants like olives and vines, and although farming practices remain unchanged, farming systems and the landscape change as big landowners and the church own large estates and gradually small free farmers disappear (Lefort, 2002). In the 14th century Ottoman conquests gradually take the land from Frankish lords - landowners and the remaining Byzantine provincial rulers.

The Ottoman Empire brought forward some very important changes in farm structures and management. The whole political and administrative structure of the Empire was against big landowners and in favour of close central control of the land and the resources (Islamoglou-Inan, 1994). Only much later (after the 17th century) large estates were created (Vergopoulos 1975). At the same time, large expanses of land were granted administrative and political liberties in exchange for taxes. Such areas were mountains and islands in Greece. Most of the Ottoman administration and army was located in the plains and semi-mountain areas and on the largest islands only.

Therefore, mountain and island landscapes at the time were characterised by common management systems and decisions at the community level. These liberties helped in the flourishing of mountain economies and of population rise, creating complex cultivation - grazing landscapes, with combinations of permanent settlers, small scale and long distance transhumance. On the smaller islands, maritime trade (and piracy) was always another option for island populations, but these societies were always supported by complex and elaborate systems of utilising land resources to a maximum. This rough historical outline is summarised in Table 1.

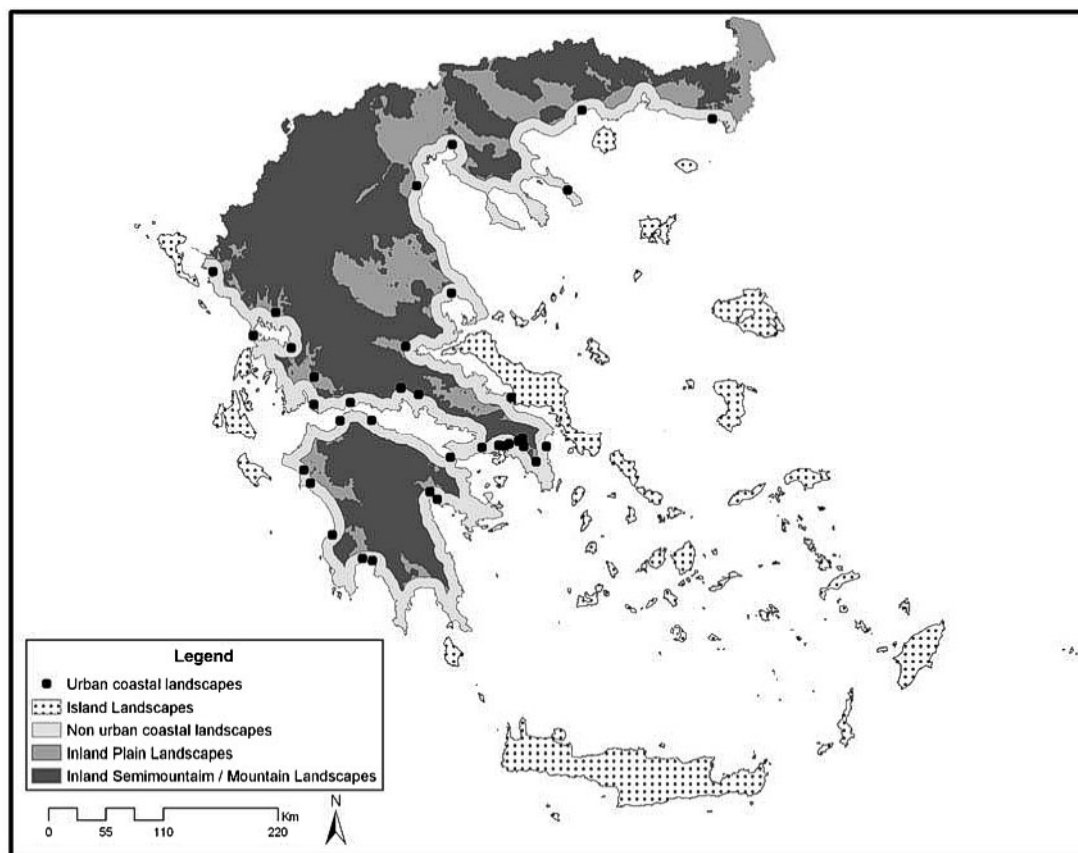
After the creation of the Greek State, these areas lost more than community control over their resources; they lost a comparative advantage of producing in small scale in small, protective markets, in favour of more open markets. They were considered as less favoured compared to plains and fertile areas and were gradually abandoned.

The main characteristics of traditional management systems were (Gasparis, 1997; Horden and Purcell, 2000; Pinto-Correia and Vos, 2004): (a) the integration of agriculture and animal husbandry, with animals grazing and fertilizing fallow land and plots dedicated to growing animal feed; (b) the combination of intensive and extensive management practices, with fallow and cultivation of legumes combined with growing wheat and barley; (c) transhumance that was linked with fallow systems of cereals in the plains; (d) common management of the common resources and especially grazing lands and (e) orientation towards self-sufficiency, not in the sense of *autarchy*, i.e. producing all the food and other material one may need, but as diversification (of production and land uses), storage (of raw or processed products) and re-distribution (to markets) to lower risks and assure strong connection with markets (sometimes distant ones) in the dense communication networks of the Mediterranean (Horden and Purcell, 2000). Change is constant but on the whole is important for most rural areas after the first quarter of the 20th century and reaches a climax after 1950, with differences among localities. These changes include (Pratt and Funell, 1997) intensification of both agriculture and animal husbandry (i.e. mechanisation, irrigation, chemical fertilizers and plant production products along with more livestock and imported feeding stuff for animals).

TABLE 1: ROUGH HISTORIC OUTLINE OF GREEK RURAL LANDSCAPE HISTORY

Period	Political situation	Land uses and practices	Landscape elements	Localities with special interest
9,000 years ago,	–	–	Consolidation of coastline.	Coastal caves, inland plains
Mesolithic to early Neolithic (up to 7,000 BC)	Settlements	Mixed cereal and pulses cultivation system; Sheep and goat; Practices closer to horticulture (lack of ploughs); Typical settlements of 50 to 300 people	Forests and forest areas; cleared land close to settlements	– Fertile plains of eastern central Greece – On islands, at end of Neolithic (4,000 BC) – In uplands 2,000 BC
Beginning of 2nd Millennium BC – Classical times	City States (<i>Poleis</i>); many small free farmers	Ploughs with animal traction key development. Three systems: (a) cereal cultivation – fallow; (b) olive trees and vineyards; (c) animal husbandry with periodic transhumance	From 1,500 BC onwards a human landscape: terraces, irrigation networks, small fields, managed forests and small rural settlements alongside growing cities Not linear: Periods of cultivation growth and abatement	Coastal cities and plains; gradually everywhere
Roman era (2nd century BC – 4th AC)	Roman empire; big landlords and small free framers	Same systems; more intensification and more “commercial” crops for the growing cities; new tools, plants and practices	Open landscapes of cereals, big farms, terraces expansion, water management	Population growth and cultivated area increase
Byzantine era (7th – 13th AC)	Byzantine empire; big landlords, church lands increase, small free framers disappear gradually	Decline of population and cultivated land, especially “commercial” (olives, vines), systems unchanged	Less cultivated land, large estates	–
Byzantine, Frankish and Ottoman period (14th – 15th AC)	Byzantine small kingdoms, Frankish and Italian areas, Ottoman empire expanding	Decline of population and cultivated land, in some Frankish and Italian lands “commercial” cultivations	Less cultivated land, large estates	Frankish lands on islands and South Greece; Italian lands on islands and ports; Byzantine lands in the Peloponnesus and KonstantinopolisS
Ottoman Empire (15th – 19th century)	Ottoman Empire; Small free farmers; only later big farmers; large expanses of land with administrative liberties (mountains and islands	Management systems: (a) integration of agriculture and animal husbandry; (b) combination of intensive and extensive practices (fallow, mixed cultivation); (c) transhumance; (d) common management (forest and grazing lands); (e) orientation towards selfsufficiency.	See Figures 2, 3, 4	–
Greek State (1927 – today)	After agrarian reform (1932) small family farming; central administration and mountains and islands lost community control over their resources	Change constant, important after 1930s and especially 1950s with intensification of agriculture and animal husbandry (i.e. mechanisation, irrigation, chemical fertilizers and plant production products; more livestock and imported feeding stuff for animals).	See Figures 2, 3, 4	Mountains and islands considered as less favoured compared to plains and fertile areas and gradually abandoned; rise of the cities and especially Athens

Figure 1. Greek landscapes.



3. EXAMPLES OF RURAL LANDSCAPES AND ENVIRONMENTAL MANAGEMENT IN GREECE

The short historical description can yield a simple distinction of Greek rural landscapes (the distinction between rural and urban landscapes is not considered here) in three broad types: island, coastal - level and mountain agricultural landscapes (Figure 1). From both a physical geographical and a human geographical perspective, these three broad types represent three different and highly variable and historically changing geographical entities.

3.1. Grazing management and forestry in the mountains

Greece is a mountainous country. The mountain range of Pindos serves as a backbone of the main continental

peninsula and forms a natural barrier between the east and the west coast. In antiquity, this area was uncharted and regarded as "wild" country. In Byzantine times the first nomadic and semi-nomadic herders established themselves (Laiou, 1992) and transhumant sheep and goat husbandry has been practiced constantly since. The relative freedom from authority made these mountains attractive places for Christian populations during Ottoman times and the population increased, forming a complex cultural landscape.

This landscape was shaped around the main settlement, a village located on a South facing slope, typically at 800 - 1,000 m, above most of the cultivations and below grazing lands and forests. The land can be private fields (for cultivation or meadows) and common land (grazing lands and forests). The spatial allocation of the land uses

followed some common lines (Nitsiakos, 1995): closer to the main settlement and facing south, garden crops and vegetables were grown into small private and irrigated fields. More often downhill and rarely uphill some of the cultivations were found, the most important of which were cereals and especially barley and legumes, along with small woods and meadows. At even lower altitudes (400 - 600 m) and following local particularities vines and more crops were found. If the distance was more than 10 - 15 km, seasonal houses were usually built for staying in the fields during summer harvest and temporarily storing crops. Fields were small and separated by hedgerows or small trenches. Further uphill (up until 1,100 m roughly) the *kladero* forest was located, typically a sparse oak forest that was grazed in the summer and some of the oak branches were cut and stored upon the trees for the winter when grass was not enough for feeding the animals. At higher altitudes (up to 1,500 m) the pine, fir and beech forests for wood and timber were located. Even higher and from as low as 1,300 m, the communal summer grazing lands were located. The picture is completed by the dense footpaths network, some of which were very broad, paved with great care and supported by magnificent arched stone bridges. The settlement's limits are marked by natural or cultural points (typically small churches that "protect" the settlement). An idealisation of this landscape is depicted in Figure 2A.

Animal husbandry and timber trade were the main occupations of the people. The animals kept were mainly sheep and goats (used for cheeses, meat and wool) with different transhumance practices. Some tribes were permanently located in their settlements or worked as shepherds for big transhumant herds, others moved only their herds (and not their households and families) seasonally to the plains in the winter and returned in the fall and others moved their households and families along with the herds seasonally to summer seasonal settlements. Forestry was integrated with agriculture and animal husbandry and forest management included: (a) Tree planting; (b) Pollarding, coppicing and other practices for wood fuel and timber (Grove and Rackham, 2002; Nitsiakos, 1995); (c) Hunting; (d) Collecting wild fruit and nuts (acorns, mushrooms, berries, snails, etc.); and (e) Grazing. Apart from herding and forestry, artisan production of a number of objects from wood and wool or craftsmanship of stone masonry was also very important for some localities and provided extra

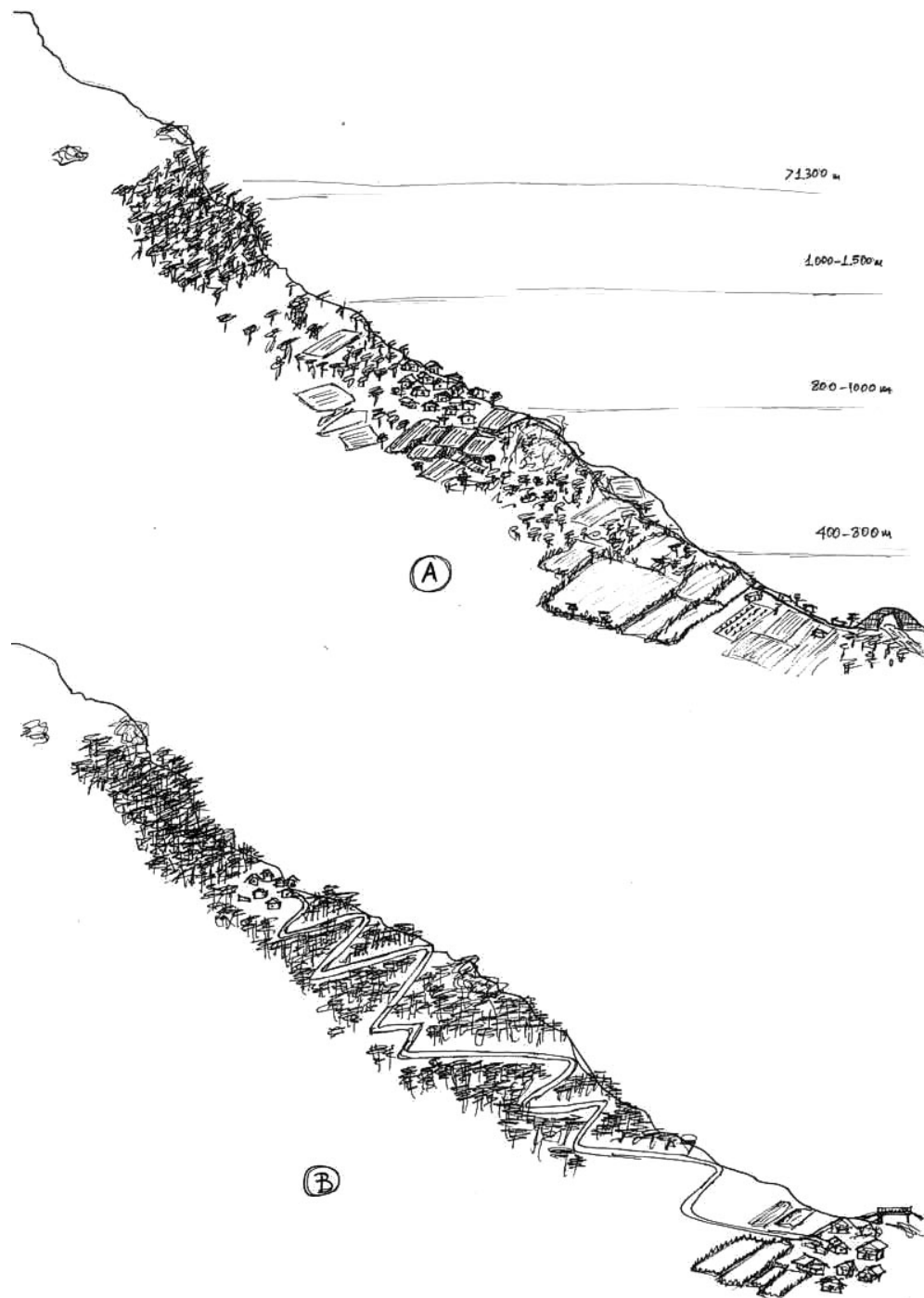
incomes. Especially stone masonry was turned into a local speciality and bands of builders travelled throughout Greece offering well-paid services.

The most common social organization was the *tseligato*, a co-operating organisation of herdsmen under a powerful leader (typically elected, but in practice the most financially powerful families ruled these associations). The whole system offered security and a stable way of life, based on tradition and loyalty, very inward directed (Damianakos, 2002). It worked along with the winter fallow lands of the big cereal holding in the plains, as the herds paid a low rent to graze in them. Summer communal grazing lands were divided in a public meeting in the settlement according to the number of animals each *tseligato* had (Nitsiakos, 1995). Herdsmen employed many shepherds (usually from poor families) that followed their movements. The fragile and harsh environments and the increasing population made migration a necessity for some of the members of poorer households, seasonally to seek employment and incomes in the plains or permanently.

This flourishing economy rapidly collapsed during the 20th century due to a number of different reasons. First of all, the Greek State claimed control over communal lands and forests and the, sometimes unfair but at all times local, systems of sharing common resources stopped, giving their management to a few, politically powerful inhabitants. Second, the civil war of 1945-1949 divided local populations. Given that all the fights were conducted on the mountains and that after the end of the war many of those who lost fled the country, it is no surprise that this war is regarded as the sign of the end of many of the mountain communities. Third, agriculture on the plains was intensified and mountain cultivations and products could no longer compete even in local markets. Finally, the comparison of the new quality of life in the cities to that on isolated mountain settlements reinforced the population exodus.

These factors changed dramatically the landscape. Some of the settlements are almost completely deserted and the remaining population is ageing. Agriculture is abandoned and the forests consumed all former agricultural land. Forestry mostly and animal husbandry on a lesser degree are left as two economic activities for the remaining local population. An idealisation of these changes is depicted in Figure 2B.

Figure 2. Idealised landscape of a mountain landscape of the Pindos Mountains: A) the Landscape in the beginning of the 20th century with the settlement at 800 - 1,000m; cultivations include cereals, legumes and meadows, at lower altitudes vines and more crops; Uphill (<1,100m) the kladero forest was located; above (<1,500m) pine, fir and beech forests; even higher (>1,300m) communal summer grazing lands (adapted from Nitsiakos, 1995, p. 214). B) The same landscape in the beginning of the 21st century, with abandoned fields turned into dense forests; the former settlement with very small population and new settlements at lower altitudes



Recently, mountains are rediscovered by urban populations as places for relaxation and getting back "in touch with nature" and the deserted villages are visited again. In some settlements, new expensive holiday houses are being built and during winter holidays they are full of visitors. This tourist development provides incomes to some locals and is in some cases revitalising the population, though most of these employed in tourism come and leave with the tourists. The former farming landscape is now replaced by forests, which are more desirable by urban populations. This development is not negative in environmental terms, but important local knowledge in managing these fragile ecosystems in a more or less environmentally friendly way is lost.

3.2. Mixed and olive cultivation on the islands and southern Greece

Greece is, apart from mountainous, an insular country as well. In total, 112 islands are inhabited today in the Ionian and the Aegean Sea. Here, only the landscapes of the Aegean islands are presented. The natural vegetation of the islands is Mediterranean sclerophyllous, evergreen flora forming mixed forests (Mucher *et al.*, 2003) of maquis, phrygana and pine - oak forests (Allen 2001, Grove and Rackham 2002) with more arid ecosystems in the South.

Human landscapes on the Aegean Islands date back to the Neolithic (Doumas *et al.*, 1999), but Classical, Hellenistic and Roman landscapes are better documented. Aegean islands flourish until late Roman times (Jameson *et al.*, 1994) and the evidence suggests a cultural landscape resembling in some respects that of the 18th and 19th century, with cultivation on terraces, tree cultivation (olives, figs, almonds, oaks) and vines (Foxhall 1996, Grove and Rackham 2002, Price and Nixon 2005). Political instability in the Middle Ages and the collapse of the late Antiquity economy brings significant population decline on most of the islands and noticeable landscape differences. Forts and castles are built on coastal areas due to the rising threat of piracy and populations "retreat" inland in naturally defended spots or away from the coast. The different lords of the islands (Byzantine, Italian, French, Ottoman) bring some differences in plants and practices, but the existing evidence suggests that these are rather limited and in general they preferred to leave locals man-

age their own affairs (Lock, 1998), except for bigger and richer islands.

The organization of the landscape on most of them is similar and structured around settlements and land suitability. Cereals and pulse were the main calorie providers, in biennial or three-year cycles of fallow and/or crop rotation with many different legumes and barley, wheat and rye for cereals (Grove and Rackham, 2002; Petmezas, 2003; Asdrahas *et al.*, 2003). Olive plantations and vines are common and in the largest islands' plain and fertile areas industrial and intensive cultivations are introduced (cotton, tobacco). Mountainous, barren or inaccessible land was grazed by sheep and goats with transhumance practices on some large islands (e.g. Lesvos, Kizos and Koulouri, 2006). Fields are small. Forests, forest areas, savannas and shrublands of oaks and pines are managed for wood and timber, grazed and used for collecting acorns and hunting. As in the mountains of Pindos, on Aegean islands, production was oriented towards self-sufficiency by diversifying production, storing and redistributing to markets raw or processed products (Horden and Purcell, 2000). Going to the sea was always an option for local populations and small time local trade a lucrative and common occupation, ensuring strong connection with markets. Finally, the end of the 19th century marks the rapid economic development of many islands, based on the flourishing local, Black Sea and Mediterranean trade and industrial development, in the agri-food and textiles sector boosted by new steam technologies.

The landscape elements of the above management systems and land uses are (Grove and Rackham, 2002; Gasparis, 1997; Kizos and Koulouri, 2006) (Figure 3A):

- (a) Terraces, which were constructed in order to increase cultivated land and preserve natural resources (soil and water). They are abundant on Aegean islands in three types (Rackham and Moody 1996): step (in straight line or along contours); braided (zigzag on the slope); and pocket (for individual trees). The first two types supported many different land uses, such as cereals, vegetables, legumes, and other arable crops; vines and trees (orchards, chestnuts, nuts and olives); and grazing lands (sown with pulses or cereals). The last type supported mostly olives. Today, the abandonment of agriculture on terraces has resulted in the slow but steady degradation of their quality, if not their destruction and/or removal.

(b) Fences, which are of two types: hedgerows and dry stone walls. Hedgerows are very rare on Aegean islands, but stone walls are very common as protection from grazing or for marking rangeland - fields limits. When they separate grazing lands they are vertical to the contours and rectangular when they separate fields. Modern fences are made of wire and often replace fallen stone walls.

(c) Footpaths that range from simple passages through fields to paved and broad paths. Today, they are either replaced by dirt or asphalt roads or abandoned and covered by vegetation.

(d) Agriculture and animal husbandry infrastructure, which includes many different elements such as storehouses, animal yards, dwellings, constructions for harvesting, irrigating, watering animals or processing products (threshing floors, wine presses, windmills, water mills, wells, tanks, etc.). These constructions are part of the local architectural and craftsmanship stone building tradition and may differ even on the same island. The decline of traditional management systems, new and cheaper building materials and the scarcity of craftsmen, have led to the degradation of their quality or replacement of stone with modern materials (concrete, metal, etc.).

(e) Rural constructions, which are non-house constructions, mainly temples, churches, etc. scattered in the countryside.

Apart from the rest of the common factors for all Greek rural areas that changed the landscapes of the Aegean Islands in the 20th century (intensification of agriculture on the plains and marginalisation on the islands, social changes, etc.) some are unique to them. The development of ground transportation favoured continental areas and resulted in the closing or relocating of almost all industrial and trading activities and reinforced migration to urban areas. At the same time, after the 1922 Greek - Turkish war all transactions, movements and investments between the islands and Asia Minor stopped, depriving many of them of their historically closest areas. The population declined significantly from the high 1950s levels until the 1990s, with 11 islands losing more than half of their population. Today, population is stabilized to 1991 levels but the societies are ageing, with young people still leaving.

These developments affected land uses greatly. Almost all cultivations except for olives declined, indicating a

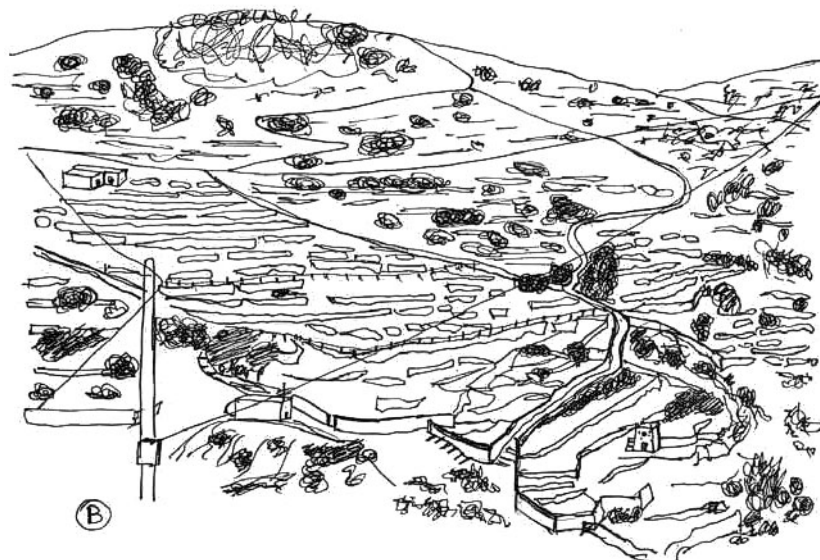
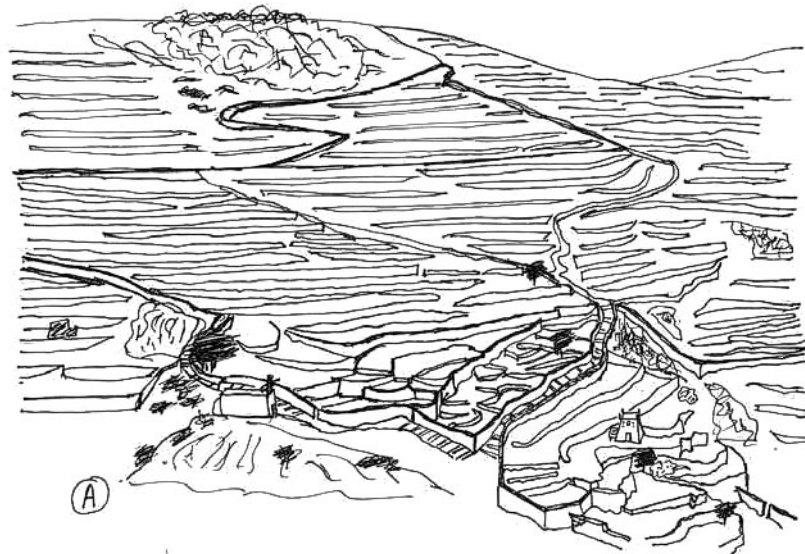
fundamental change in management systems, a gradual halt of practices that combined different land uses, agriculture and animal husbandry (fallow, seasonal movements, mixed farming). Most of the elements that characterized Aegean landscapes are neglected and their quality deteriorates (Figure 3B). Forests and shrub lands increase in the mountains, as fields are abandoned. In the limited plains, agriculture is intensified by pumping for animal feeding stuff or vegetables in greenhouses. On the other hand, the number of sheep increases resulting to grazing in high densities and leading to overgrazing and erosion. Finally, a number of distinct products are found on the Aegean Islands, with 62 of the 84 registered Protected Designation of Origin (PDOs) and Protected Geographical Indication (PGIs) products until 2005 being produced on one or more islands (33 exclusively on islands).

Economic decline and population loss was balanced in some islands by the emergence of tourism after the 1960s or 1970s that brought major pressures to agricultural land, especially in coastal areas. Today, local economy is based on tourism, but agriculture is still important especially on smaller islands, due to the lack of other opportunities. Low incomes from the farms and opportunities in tourism have made hobby and part time farming very important in the area. The former farming landscape is now replaced by scrub, maquis forests and buildings, either for tourists, or holiday homes, while the elements of this old landscape are destroyed. These developments are negative in environmental terms, as not only urban land uses expand but here, again as in the Pindos Mountains, the local knowledge of managing these fragile ecosystems in a more or less environmentally friendly way is lost.

3.3. Arable farming in the plains

All around the Mediterranean, many plains were not very suitable for cultivation or habitation until recently due to the periodic or permanent flooding of large areas and unhealthy conditions (Horden and Purcell, 2000). Only after the artificial draining of many wetlands in the 20th century these plains became habitable and were cultivated. This is true for some of the greatest plains of Greece (e.g. the greatest part of the Thessaloniki plain was drained and cultivated in the 1930s).

Figure 3. Idealised landscape of an island (Sifnos): A) the Landscape in the beginning of the 20th century with terraces, paths, stone walls and farming infrastructure scattered in the densely used landscape; cultivations include cereals, legumes and vines. B) The same landscape in the beginning of the 21st century, with abandoned fields, some grazed, others not; landscape features are slowly destroyed (drawing by a picture by the author of Sifnos in summer 2004).



The plain of Thessaly has a long history of cereal cultivation. It was one of the first locations where cereal cultivation in Greece is recorded (Halstead, 1996). In Ottoman times, the development of mountain animal husbandry was closely linked with cereal cultivation on the plains. Herds grazed fallow lands of the big *ciflic* estates, created after the 16th century from former *timars* (Islamoglou-Inan, 1994). These large estates coexisted with small Muslim and Christian farmers who were either landless (therefore employed by the big estates), or with small farms and had to work for big landowners as well.

Cereals were the main crop, in a typical open landscape. The management practices were biennial or three-year cycles of fallow and crop rotation. The biennial cycles included cereals – fallow (grazed by animals); and cereals – pulse. Three year cycles included rotation of winter cereals (1st year) – summer cereals (or pulse, 2nd year) – and fallow grazed by animals (3rd year). Wheat was the main product in the most fertile plains, but barley was also found in hills and poorer soils. Maize and rye, used mostly for animal feeding stuff are also encountered (Prontzas, 1992). Wood fuel was collected from scattered trees or small forests and timber had to be carried from mountain forests. Settlements were typically small villages, but some of the workers of the estates lived near their main buildings. An idealized landscape is pictured in Figure 4A.

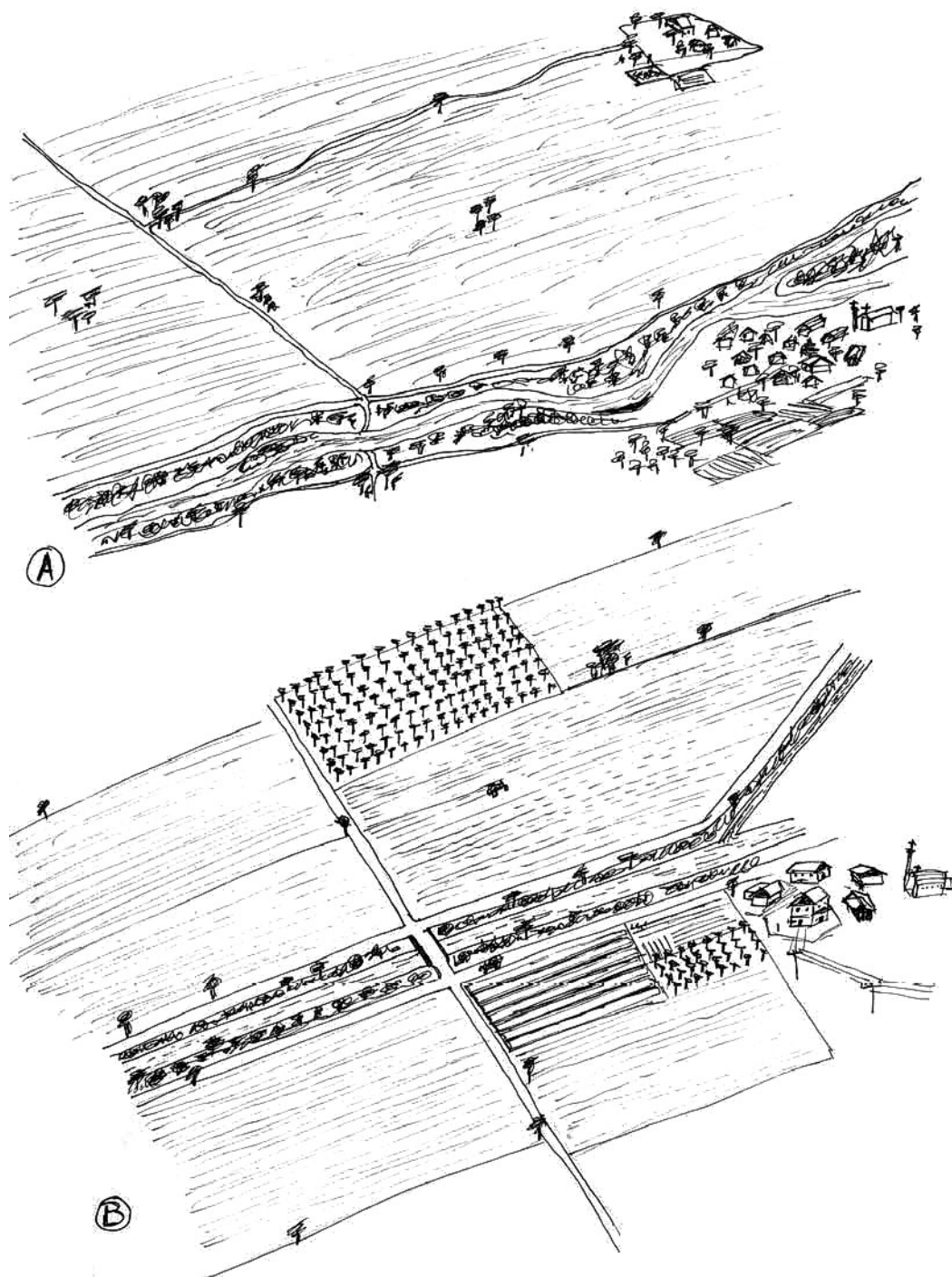
Changes start already at the end of the 19th century, when big landowners had to face growing unrest and struggle for reforms from the landless peasants or small farmers, along with growing demand from European markets for their products, as the Ottoman State initiated economic reforms that eased domestic and international trade. Ottoman owners started selling the land to Istanbul Greeks in the late 19th century, as they were seeing that it was a matter of time before the area would be part of the young then Greek State. After the incorporation in the Greek State, the new owners intensified production by reducing fallow and introducing new management practices and equipment from "the west" (especially France). Customary "rights" of local farmers were not incorporated in the new legislation and this resulted in stronger local unrest and eventually violence between the police (that supported big landowners) and private security forces of the landowners on one side and farmers or landless peasants on the other². The agrarian reform settled the problem, by dividing big

estates to small farmers. This settle caused major changes to the landscape and practices. Small farmers intensified production further and broke the link with transhumant herds that could no longer find the large grazing lands they needed.

In the following decades, the plain of Thessaly was a strong centre of agricultural development and intensification, with irrigation networks, roads, fertilizers and plant production products and the establishment of public professional assistance to farmers, along with aids for investment in equipment later on (Figure 4B). The new management systems were highly intensive and modernized and emphasis was gradually given to industrial plants in the place of cereals (tomatoes, sugar-beets and eventually cotton). Especially cotton was spread all over the plain after the accession in the EU and the cotton Common Market Organisation that made its cultivation very profitable in the 1980s (it was named as "white gold"). These intensive systems were supported by the state in many ways: irrigation water was given as a very small price or for free, fertilisers were provided at low prices to cooperatives by state factories, petrol for tractors was cheaper, etc. As in most Western countries (Pratt and Funell, 1997), this intensification caused a number of problems in productive (overproduction), social (despite subsidies, people still migrated from rural areas) and environmental (pollution of underground aquifers, overuse of resources especially water, biodiversity loss due to monocultures, erosion) terms. Water management is particularly an issue of great concern, as underground water is getting less due to over-pumping and existing irrigation networks dry out in mid summer, when cotton water needs are dire.

Today, the plain is looking for a new development paradigm. Although the cultivation of cotton still dominates certain parts, more and more farmers turn to bio-fuel, other industrial plants with less water demands, organic agriculture, and even back to cereals. Older productions and management systems are re-evaluated and a growing number of farmers seek to diversify once again their land uses to reduce risks and use less inputs to reduce costs and increase revenues by focusing on quality rather than quantity. The change of CAP is a major driving force behind these changes, but the overall results remain unknown so far.

Figure 4. Idealised landscape of a level landscape of the Thessaly plain: A) the Landscape in the beginning of the 20th century with a small settlement and a farmstead of a tsiflic; cultivations are cereals and legumes, garden crops for domestic use close to the settlement. B) The same landscape in the beginning of the 21st century, with the river channelled and the water used for irrigating industrial crops (mostly cotton, but also beetroot and tomatoes).



4. DISCUSSION: "OCCIDENT" AND "ORIENT" ENVIRONMENTAL MANAGEMENT

The environmental management of agricultural landscapes is a complex issue. It is grounded on separate actions of individuals along lines that are very rarely explicit. In fact, farmers do what they consider will be better for them in order to produce more or earn more and not for the landscape. At the same time, they are not wholly independent from the society they live in and follow traditions, examples that prove successful, or policies. In this complex and sometimes chaotic way farming systems are created. This complex nature implies that they are constantly changing and the idealisations presented here serve as sketches of a more complicated overall picture. The landscapes they shape are constantly changing also, reflecting the continuous changes of the farming systems, but at the same time bearing marks of past systems as well.

In this paper, some characteristic rural Greek landscapes of today are presented, two more traditional and one modern, and the changes of the farming styles that have formed them are discussed in an environmental management light. What stems from the discussion is that:

- (a) The distinction between "traditional" and "modern" farming systems is still valid for rural Greece today and that this distinction can be traced partly back to the divide between the "oriental" and the "occidental" production systems that policy and ideological discourses introduced, by favouring "occidental" systems instead of "oriental" ones. This divide has gained a different content today when on one hand the increase of production is not considered as something positive anymore, while society raises issues regarding the rural landscape on the other, considering alternatives for some of the problems agriculture and farming face.
- (b) The findings indicate that traditional farming styles did indeed have positive environmental impacts compared to modern ones. The reasons behind this assertion lie in the character of the different systems. Modern "western" systems aim at increasing production volume and productivity per area and per working unit. Although these aims are reached, the price that has to be paid is high with hidden costs that arise from the fact that soil fertility has to be kept artificially high; diseases and enemies of the plants or

the animals have to be fought with expensive and poisonous protection products and moreover the natural resources of the area are degraded. Traditional "oriental" systems on the other hand are more concerned with the relatively long term preservation of a level of soil fertility and resources availability. This overarching principle does not imply that decisions and actions of farmers in these traditional systems were intentionally sustainable. On the contrary, the evidence seems to support that they were as much interested in raising their production and incomes as farmers in modern systems. The fact though that no external inputs were available for their traditional systems forced them to utilise practices that preserved resources, making a virtue out of necessity. Again, this must not be taken to imply that all traditional systems are more sustainable than modern ones. Surely, environmental problems and degradation of resources were problems for traditional systems as well and the need to migrate to provide food or money or simply the level of population density in some areas indicates overexploitation of resources³. Finally, another common misinterpretation of such data is to consider traditional management systems as tokens of a better society and way of life. The fact remains that everyday life in the traditional systems presented here (on the islands and in the mountains) was extremely harsh and unjust. Malnourishment and hunger are typically reported even in rich communities and rich and powerful families or lords controlled the land and manipulated the system for their gain. Women are invisible in this setting, especially in the mountains case, although their help in management is vital. In any case, such systems are not directly applicable again, but some of their features and practices could be used today in sustainable rural landscape management.

(c) It is difficult to discern the future of "oriental" and "occidental" farming systems in Greece. Different driving forces change them and the agricultural landscapes of Greece. The most important of these driving forces in the future will be the focus of agricultural policies from the agricultural (i.e. assistance to production) to the rural (i.e. assistance to farmers or generally residents of rural areas); the continuing land use conflicts of farm land and housing uses; and the breaking up of agriculture to two distinct branches, professional farmers that use more and more contracts with agri-food industry being the one branch and quality small time and part time farming being the other. It seems that traditional management systems and landscapes will be less affected by these driving forces than modern ones.

Concluding, different farming styles that correspond to different environmental management systems seem to be linked with wider issues than just profitability and effectiveness; they are politically and ideologically laden. The example of Greece is characteristic, with

whole systems and landscapes being characterised as outdated until recently. A recent re-evaluation of such systems is indicative of the shift of ideology and policy from production to quality, favouring again "oriental" traditional systems.

NOTAS

- 1 The agricultural reform had other targets as well, including satisfying the landless farmers, dividing big estates and providing a livelihood to refugees from the 1922 Greece - Turkey War.
- 2 These incidents are celebrated today as a symbol of farm revolt and the triumph of the poor, small farmers against rich big landowners.
- 3 Environmental "failures" of traditional systems are discussed at length by Diamond (2005) who provides some characteristic examples.

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