Alternative development and biodiversity conservation: Two case studies from Greece

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Introduction

The Mediterranean has long been plagued by unsustainable development associated with conventional tourism. Valuable coastal and marine ecosystems have been destroyed to accommodate marinas, seaside hotels and recreational activities at sites which are important habitats for Mediterranean fauna and flora. An alternative to this model of tourist development has begun to emerge in the form of ecotourism: sites with important biological diversity have become organized to accommodate nature-seeking tourists, orienting them to the specific interests of the areas. These sites provide a lower level of tourist accommodation and services which is, however, compensated by the outstanding beauty and interest of the areas.

In Greece, two such cases developed to a large extent around protected areas. In the Prespa lakes of northwestern Greece, a National Park and Ramsar site has been designated because of the rich biodiversity of the site. Particularly known for the spectacular colonies of Dalmatian pelicans, which are a world-wide endangered species, the area is a rich mosaic of lakes, forests, and rural landscape. The second site is the Dadia-Lefkimi-Soufli forest reserve in northeastern Greece, on the border of the river Evros. Also designated a protected area, the forest reserve is the habitat of many species of raptors, including the Black vulture, the Griffon vulture, eagles, owls as well as a rich variety of amphibians and reptiles. A characteristic of both sites is the relatively low level of development compared to other areas of Greece. The adjacent population is mainly concerned with fishing, farming, timber production or livestock and there is a lack of basic services such as hospitals, schools, or commercial activities.

In both sites, conservation bodies followed the initial identification of the scientific importance by investments in public awareness, education and basic conservation activities. In time, these investments attracted visitors, who were able to appreciate the significance of the areas through the information provided by the local conservation projects. The local people were able to

acquire additional income by providing food, accommodation, and interpretation services, and additional funds were provided by government and international agencies. During the past seven years, significant alternative income that has been generated at these sites, due in large part to the attention that has been paid to highlight their conservation value and to make this information accessible to ordinary visitors. It is important to ensure the sustainability of such income, through the creation of jobs and infrastructure which can continue to provide access to these sites and contribute to their conservation in the future.

Conservation and development of protected areas

A key to the maintenance and enhancement of parks and protected areas in Europe is mobilizing public and political support for their conservation. Ways must be found to demonstrate that the conservation of nature and sustainable use of natural resources is relevant to the daily lives of people, even those who may never visit a protected area. In Greece, as in several other Mediterranean countries, protected areas are usually seen as a problem, an intrusion on the lives of local people and irrelevant to their daily needs. Restrictions on land use or natural resource exploitation are usually ignored, if not actively sabotaged because of the infringement on locally generated income.

One way of developing the support of the local people is to encourage the influx of visitors from outside the area, which brings supplementary income and awareness of the site´s importance. Ecotourism has been defined as "environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy and appreciate nature… that promotes conservation, has low visitor impact, and provides beneficially active socio-economic involvement of local populations." (Ceballos-Lascurain, 1996). A prerequisite for this type of activity is effective communication to the public at large of the values and interests of the park or protected area. Environmental education must be developed in a way that is accessible to ordinary citizens, adaptable to the needs of the old or the young, the city-dweller, the policy maker or the tourist. (IUCN, 1994). Another prerequisite is the consistent presence on site of individuals or groups actively involved in these pursuits. Often this can only be achieved by investment from private sources, in particular, in the cases mentioned here, from conservation organizations which have the means and flexibility to ensure continuous support. This support, however minimal, can fill in the gaps between government funded programmes whose development and implementation are often plagued by bureaucratic delays.

Prespa

Lakes Mikri and Megali Prespa are situated in Western Macedonia, Greece on border areas between Greece, Albania and Former Yugoslav Republic of

Macedonia. The lakes as well as their surroundings constitute Prespa National Park, an important centre of biological diversity containing more than a thousand plant species. Also designated as a Ramsar site, they include among the largest freshwater marshes in the eastern Mediterranean, which fluctuate in size, flooding wide expanses of the surrounding land during the spring (Pearce, 1994).

Lake Mikri Prespa is an important breeding ground for Dalmatian and white pelicans (Perennou, 1996). Today it constitutes the largest known nesting colony of Dalmatian pelicans in the world (Crivelli, 1997). The lake and flooded meadows also support endemic populations of invertebrates and fish, such as the Barbus prespensis or barbel, one of 11 native species found in the lakes and listed as "endangered" in the Red Data Book of threatened Vertebrates in Greece (Hellenic Zoological Society, 1992, Catsadorakis, 1996, Maitland, 1996, and Crivelli, 1996).

Since Prespa is located in a remote area, the Greek part is permanently inhabited by only 1,200 people in 12 settlements. A traditional subsistence economy combined crop farming with livestock, fishing and collecting from nature following the end of the 1940´s. Most of the crop holdings were small and scattered, separated with natural hedges and interspersed with fruit trees and natural forest. In 1962, a surface irrigation network was designed to convert rainfed crops to irrigated ones and thus increase production. Policy makers expected to retain the population at this border area and reduce or halt emigration. At the time, the region was one of the least developed in Greece mainly due to the effects of the civil war. The increasing intensification of agriculture gradually displaced the subsistence economy. By 1985, the monoculture cultivation of beans replaced mixed farming methods and reduced livestock by more than 56% in 1993 compared to the mid-1960´s (Catsadorakis, 1996). The discovery of the area´s biological significance dates from the 1960´s when ornithologists visited the area and observed pelican colonies and a rich biodiversity in plants and animals. In 1974, the area was designated a National Park in Greece, and in 1975, a field Biological Station was constructed on the banks of Mikri Prespa, funded by the Hellenic Society for the Preservation of the Environment and the Cultural Heritage, or Elliniki Etairia (Scoullos, 1998). This station was subsequently used to host students, scientists and visiting researchers, as well as conferences and volunteer activities. Investments in scientific research continued with the monitoring of endangered species, in particular the Dalmatian pelican, as well as the fish fauna of the lakes, forest birds, mountain flora, reptiles and amphibians, soil, aquatic vegetation, and water quality (Crivelli, 1997). Funding for this research came from many international and national organizations, such as the RSPB, the A.V. Jenson Foundation, the Danish Ornithological Society, Greek universities and non-governmental organizations. The Tour du Valat recently completed fifteen years of continuous monitoring programmes financed at the level of 40-60,000 FF per year (Crivelli, 1998).

In 1984, a pilot Integrated Mediterranean Programme (IMP) financed by the EEC was used to complete the irrigation works which had begun in 1962, and to build an ill-fated fish breeding station which destroyed valuable wet meadows. The station was never to operate, due to the opposition of conservationists and scientists who sued Greece through the European Commission. The IMP programme, however, also financed two buildings which were later to serve for accommodations and meetings, one in Aghios Germanos and another in the village of Psarades, which are operated today by womens´ cooperatives (SPP, 1997).

In 1990, four international conservation organizations and six Greek NGOs formed the Society for the Protection of Prespa (SPP). This locally-based society served to coordinate all of the protection efforts and provided a base for public awareness and education activities. In 1992, an Information/Visitor´s centre was established, the first ever existing in a Greek National Park, and guided tours were developed as well as an environmental education programme for schools. Annually at least 6,000 visitors pass through to view the exhibits, and 5,000 schoolchildren from all over Greece participate in the programmes (Crivelli, 1997).

Local people were trained to become guides and were employed on a part-time basis, while a number of associated activities were developed through another EU programme jointly funded by the World Wide Fund for Nature (WWF) and the European Commission, called CADISPA (Conservation and Development in Sparsely Populated Areas). Activities included the support of organic farming, and the marketing of local products such as woolen socks, herbs, dried beans and preserves through the information centres. CADISPA also funded studies on preserving local architecture and on the local breed of dwarf cattle, in an effort to preserve the last individuals. In parallel, conservation activities were conducted in the form of wardening pelican colonies to prevent disturbances, and providing information and awareness to farmers, fishermen and other local people on the values of the area. Regular groups of volunteers come to Prespa to assist in the designation of hiking trails, garbage collection or the renovation of old buildings, including a water mill in Aghios Germanos.

Today about 80% of the local people are cultivating beans with conventional methods. These cultivations threaten the wet meadow habitats for breeding birds as well as the water quality of the lakes from runoff of agricultural chemicals. The promotion of organic bean cultivation in the surrounding hillsides was assisted by the SPP by providing technical and marketing assistance as well as by seeking organic certification. Organic bean production has higher than average yields and premium prices. During a recent crisis in the bean market, conventionally grown Prespa beans were sold at very low prices or not sold at all. Organic beans remained unaffected, and were in high demand in organic food shops in Thesssaloniki and Athens. As a result, interest in organic cultivation increased, with at least ten farmers practicing in 1996

(SPP, 1998). Further support for organic cultivation can be expected from the Agri-environment Regulation 2078, which has now been implemented in many areas of Greece through the Ministry of Agriculture (Cuff, 1997).

Gradually local people began to take interest in the development of the area. Rooms for accommodation and tavernas began operating, and the village of Psarades requested assistance to establish a second information centre, this time focusing on the traditional fishing practices and the rich variety of endemic fish found in the lakes. The guesthouse at Aghios Germanos is built in the traditional style, with wood-burning stoves and comfortable, though simple accommodations. Through the provision of services such as food, accommodation, boat trips and guided tours, local income has increased, supplementing the traditional occupations with income from visitors. It has been estimated that at least 50-60 people are employed in ecotourism related activities, usually on a part-time basis to supplement other occupations. Although the infrastructure is still limited and insufficient to meet demand in peak seasons, the number of Greek visitors is showing increasing trends and tends to be distributed throughout the year, with the exception of the cold winter months (Fig 1, Crivelli, 1997). Today the two visitor centres, one in Psarades and the other in Aghios Germanos, are run by trained ecoguides: young persons from the local community trained in environmental management, interpretation and ecotourism, through EU funded programmes of CADISPA and PETRA.

While local residents were initially hostile to the establishment of the National Park, fearing restrictions from legally mandated management measures, the activities of the SPP have succeeded in raising awareness and instilling pride in the significant ecological value of the area. The steadily increasing stream of visitors, especially of Greeks from all over the country, further stimulated private citizens to provide services such as food and accommodation, thus giving support to the potential of further development in the area (Table II and Table III).

This, in turn, has also renewed the interest of state development funding. Initially the Greek government was not successful in stimulating economic and social development. The investments of the past decades were poorly planned and of inappropriate scale, often diminishing the ecological values of the area (Cuff, 1997). However, in recent years, there is renewed interest: a development study was funded by the Prefecture of Florina and completed in 1996 by the Development Company of Western Macedonia in Kozani. Following this, Community Support Framework Environment Funds were committed up to a level of 320 million drachmas (See Table I). Another EU funding mechanism, the LEADER II programme, has already allocated at least 91 million to local entrepreneurs, and is expected to grant more funds during the next funding cycle, culminating in 1999. This is administered by the newly established Development Company of Florina, which also handles other EU budget lines

consistent with the trend towards eco-tourism (ANFLO, 1998). It is worth noting that an application to the first LEADER programme in 1991 was rejected because Prespa was considered a poor investment, having a small resident population and inadequate development structures to absorb and implement development aid.

Dadia - Lefkimi - Soufli Forest Reserve

The Dadia - Lefkimi -Soufli forest reserve is one of the most important habitats in Europe for the variety and density of birds of prey and herpetofauna. The forest covers the southeastern foothills of the Rhodope mountain range, at the northeastern border of Greece with Bulgaria and Turkey. Located in the prefecture of Evros in Thrace, the border of Greece with Turkey is demarcated by the Evros River, whose nearby delta has been designated a Ramsar wetland. The forest is composed of a mixture of pine and oak and is characterized by a mosaic of ecosystems including open areas, streams, creeks, densely forested patches and rocky outcrops. Due to its geographical position at the juncture of the European and Asian continents, it is one of the major flyways of migratory birds. The diversity of species is one of the rarest in the region: of the 38 raptor species known to occur in Europe, 21 nests in the area and another 10 species regularly visit for the winter (Poirazides, 1995). It is especially known for endangered species such as the Black vulture, the Griffon vulture, the Egyptian vulture, the White-tailed eagle and the Imperial eagle. The birds of prey feed on the rich variety of amphibians and reptiles. At least 40 species have been identified, including salamander, lizards, and thirteen species of snakes, frogs and toads, including many endangered species. Both common and rare mammals in the area include brown bears, wolves, wild boars, otters, foxes badgers, wildcats and susliks (Petrou, 1994).

As in the case of Prespa, this rich ecosystem was partially destroyed through inappropriate development schemes, funded by the World Bank and the Greek government. These were directed towards the intensification of forest production, the clearing of deciduous oak forests and reafforestation with fast-growing pines. The funds were also used to open forest roads for intensive exploitation. Fortunately the importance of the area as a habitat for raptors was documented by European ornithologists and biologists in the 1970´s. A study funded by the IUCN and WWF was completed in 1979 by the Dutch ornithologist Ben Hallman, entitled "Guidelines for the conservation of birds of prey in Evros." This provided the basis for a joint ministerial decision to declare Dadia a protected area. A later study on the herpetofauna by Helmer and Scholte (1985) found that the area supported the highest density of reptiles and amphibians in all of Europe (Petrou, 1994). Two core areas of 7,250 ha were designated as strictly protected areas, forbidding hunting and wood extraction. A buffer zone of 28,000 ha was also designated for limited land uses. The communities of Dadia and Lefkimi share joint jurisdiction of the reserve, together numbering about 1,250 inhabitants. Initially the local

communities were opposed to these restrictions, since they expected to lose significant income by abstaining from lumber activities. A lag time of almost a decade occurred before conservation management actions were initiated which could provide a basis for generating alternative income for the local people. It is a credit to these people that the land-use restrictions were honored for the most part throughout this period, when both the state and conservation organizations delayed in implementing active conservation measures to maintain and enhance the values of this important habitat.

In 1987, using European Community funds, the ACE (Action Communautaire pour l´Environnement) programme created the initial infrastructure for the protected area. A small observatory was constructed around 500 meters from a feeding place for the raptors. The decline in their populations was related to the decline of traditional livestock herding, and the provision of food on a regular basis was to allow the raptor populations to recover. In addition, funding was provided for the blocking of certain forest roads, the purchase of a 4WD vehicle and the building of a guest center and restaurant at the edge of the reserve to accommodate visitors. Most importantly, two wardens from the area were hired and trained to manage the feeding site and monitor the bird populations. These persons played a key role in the evolution of the area, since they were able to generate support from the local community and at the same time, became the main contacts for outsiders who wished to invest in the conservation of the area.

At the conclusion of the European Union programme, the visitor´s centre was almost fully constructed and wardening and feeding of the raptors was in place. A gap in the establishment of further EU funding was covered by WWF International through its representation in Greece. Soon afterwards, in 1992, a three year project was approved through the EU LIFE programme for management, monitoring and ecotourism activities. Funding was also provided by a corporate sponsor, Allianz, the largest German insurance company, whose support continues to this day. Through this project, a specific environmental study was completed which specified management measures to be implemented within the two core areas of the reserve (Adamakopoulos, 1994). Support for interpretation and ecotourism was provided by completing the furnishing and equipment of the visitor´s centre, and setting up an information room with slide shows, displays and printed material for visiting tourists and schoolchildren. Monitoring of raptor populations continued, and hiking trails were created.

Conservation efforts have shown to be successful in the case of the Black and Griffon vultures, whose populations are now stable or increasing (Adamakopoulos, 1994). Two foresters supported by WWF Greece permanently staff an office within the visitor's centre, and serve as advisors to the monitoring and wardening activities, and the interpretation and guided tours. They also alert local and national authorities of threats to the fragile

ecosystem and the rich animal and plant species which inhabit the area. The two scientists propose management measures which are implemented in close cooperation with the forest service and the local community in Dadia.

In 1994, the Dadia community established an independent company to manage the visitors and related ecotouristic activities. As in the case of Prespa, several local people were trained to become ecoguides, and activities were developed such as guided tours, volunteer projects, sales of printed material and local products, slide shows, meetings and accommodations for scientists, research students and foreign visitors. A local womens´ cooperative with at least 36 active participants was established in 1994 in order to prepare meals and traditional products which could be sold through the visitor´s centre. The additional supplementary incomes of the residents served to change the attitudes towards the reserve and to raise awareness and local pride for the ecological values of the area. In addition, the social life of the area changed, and young people remained in the village to settle. This is a unique reversal of the trend in most rural areas of Greece, whose young population emigrates in large numbers to cities and larger towns. (Pistolas, 1998, Tables II and IV).

Beyond Dadia, increasing interest was generated through presentations at national and international meetings, and through the promotional material distributed at fairs on the prefecture level and at annual agriculture or tourism fairs held in Thessalonike. As the numbers of visitors increased and the Dadia forest reserve became publicized, state and prefecture funding was attracted to the area, with investments in infrastructure and supplementary occupations, including ecotourism (Fig. 2). Table I shows the investments from LEADER, the Community Support Framework Environment funds, as well as the prefecture of Evros, which now extend and supplement the original core funding provided by the European Union, WWF, and other conservation bodies.

Discussion

Despite their unique characteristics, these two case studies can serve as models for other important natural areas in the Balkans and the Eastern Mediterranean. Their evolution demonstrates a number of principles which could be transferable:

The successful combination of tourism and conservation: the level of tourist services evolved gradually and is in the hands of the local people. They have developed at an appropriate scale and do not infringe on the ecological integrity of the areas.

The attraction of visitors outside the area has provided additional income which otherwise would not be generated. This is particularly relevant to the supplementary income of women in the cooperatives, most of whom have

families and therefore would not have the opportunity to seek regular employment.

The basic infrastructure which is in place gave incentives to private entrepreneurs to provide food, accommodation, and other services. This in turn, has had a multiplier effect by attracting public investments which are now oriented towards ecotourism. Government and EU funding provide a basis to continue appropriate development in the future, thus strengthening the local economy and enhancing present activities.

Perhaps the most important aspect that is relevant to other valuable habitats in the region is that ecotourism has provided the means to effectively conserve these sites. Neither international treaties nor protected area legislation had been implemented during the two decades or more since the sites were first identified as important for biodiversity. Local people could not understand nor support the land-use restrictions and limitations on activities which were seen as fundamental to their livelihoods. Ecotourism introduced alternative income and created new jobs centered on the protection and promotion of the natural values of these habitats, thus creating a new awareness and interest in their conservation. The increase in social activities associated with ecotourism kept young people in the area and reversed the trend towards emigrating to larger cities. It is a well-demonstrated fact that unless means are found to actively involve the local people and render them beneficiaries of conservation activities, then parks and protected areas have little chance of being protected in the long run (Valaoras, 1997).

Conclusions

The two case studies illustrate many of the principles of sustainable development as envisaged by the participants in the Rio Summit of 1992. It is worth noting that both were relatively undeveloped and sparsely populated border areas, which contributed to the fact that valuable ecosystems were not entirely degraded as Greece developed in the post-war years. Although habitat destruction did occur, the sites were literally "rescued" from unsuitable development by the efforts of a few enlightened scientists and conservationists who were able to communicate the rare value of these habitats to government agencies and international bodies. Subsequently, international and national conservation organizations were able to utilize private funds and later European Union funds earmarked for the environment to implement management measures and more importantly, to consistently support locally-based scientists and practitioners whose main focus was the protection of the areas. In each case, the most important factor which led to the transformation from isolation to well-publicized centres of ecotourism was the continuous financial support given to the individuals who lived and operated on site. Also, in both cases, one or two local persons were engaged from the very beginning and played a key role to facilitate the work and to "interpret" the message of

conservation to the rest of the local inhabitants, their own relatives and neighbors who needed to be convinced that protecting the area would eventually bring benefits to their families.

Are these success stories sustainable? Can they continue to bring benefits to local people and at the same time preserve the rich biodiversity that constitute the main attraction of visitors and scientists? A question which affects other protected areas is whether their evolution can serve as models for other areas in Greece and in the neighboring Balkan and Eastern Mediterranean countries. Such issues remain to be resolved. Much depends on the determination and resilience of the local people, to continue their present involvement and to resist the "easy" paths of mass tourist exploitation which has destroyed so much of Greece's natural wealth. Much depends also on the wise investments of the state and prefecture bodies that can bring European Union funding to the areas for further development on an appropriate scale. Finally, the role of national and international conservation NGOs is crucial in continuing the monitoring of the sites, the exchange of know-how, and the active involvement in conservation management, in order to ensure that the unique and valuable biological diversity is maintained and enhanced for future generations.

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Acronyms used in this report

ACE	Actions Communautarie pour L´Environnement
CADISPA	Conservation and Development in Sparsely Populated Areas
EU	European Union
EEC	European Economic Commission
IMP	Integrated Mediterranean Programme
IUCN	World Conservation Union
LEADER	European Union programme for rural development
LIFE	European Union programme for Nature Conservation
NGO	Non-governmental organization
PETRA	uropean Union programme for rural employment
RSPB	Royal Society for the Protection of Birds
SPP	Society for the Protection of Prespa
WWF	World Wide Fund for Nature

Table I. Investments in Conservation

CATEGORY	PRESPA	YEARS	DADIA	YEARS
EU ACE programme			20.000.000	1986-1989
EU CADISPA programme	44.000.000	1993-1997		
EU CADISPA programme	6.000.000	1997-1998		
Integrated Med. Prog		1984-1987	153.600.000	1986
Elliniki Etairia (for Biological Station)	10.000.000	1975-1997		
Greek Ministry of Youth			2.500.000	1987
EU ACNAT programme			200.000.000	1992-1995
WWF (co-funded by Allianz for Dadia)	100.000.000	1991-1997	80.000.000	1992-1997
EU CADISPA	43.467.938	1994-1997		
EU PETRA programme	2.902.589	1994		
Community Support Funds	320.000.000	1995-1997	196.000.000	1996
MAVA Foundation For restoration of Education	35.000.000	1996		

Centre				
LEADER I	not successful	1991	80.000.000	1996
Prefecture funding			60.000.000	1997
LEADER II	91.000.000	1995-1997	80.000.000	1997
LEADER II to the women´s coop			35.000.000	1997
Community Support Funds			40.000.000	1997-1999
TOTALS	652.000.000		945.000.000	

All amounts quoted are in Greek Drachmas for the years specified Sources: K. Pistolas, Ecotourism Centre of Dadia and M. Malakou, SPP, M. Scoullos, Elliniki Etairia and ANFLO, Florina

Table ii. Benefits and Income to the Local Community

CATEGORY	PRESPA	**YEARS**	**DADIA**	**YEARS**
Jobs (numbers)	4 full-time 16 part-time	1990-1997	11 full-time 45 part-time	1990-1997
Visitors (numbers)of which students:	49.000 18.000	1994-1996	60.832	mid 1994-1997
Guided tours (income)	1.200.000 per year	1995-1997	4.959.641	1996-mid 1997
Shops & information centre incl. Publications(income)	10.276.000	1996	7.229.897	mid 1997
Sales of organic beans (income)	1.620.000	1996-1997	not applicable	not applicable
Guest house (income)	not available		21.185.218	1996-mid-1997
Food & drinks at guest house (income)	not available		53.637.834	1995-mid 1997
Women´s cooperative; sales of products and refreshments to visitors	not available		24.000.000	1994-1996

Sources: K. Pistolas, Ecotourism Centre of Dadia, and M. Malakou, SPP All income and sales numbers are in Greek Drachmas for the years specified

Table III Increase in Visitors to Prespa

	1993	1994	1995	1996
Students	2300	4000	5500	8400
Tourists	3027	7328	7649	12123
TOTALS	5327	11328	13149	20523

Sources: SPP and RSPB

Table IV Increase in Net Profits from Ecotourism in Dadia

1995	679.840
1996	2.571.398
1997*	7.274.631

(* until 31-7-1997)

Source: K. Pistolas, Ecotourism Centre of Dadia

Fig. 1. Visitors to Prespa
Temporal distribution of numbers of visitors within an annual cycle. Data of years 1993-1995 based on numbers of people visiting the Information Centre of the Society for the Protection of Prespa in Agios Germanos village.
Source: Crivelli, 1997

Fig 2. Visitors to Dadia
Monthly visitors to Dadia from 1994 to 1997 showing peaks during the months of May and August
Source: K. Pistolas, Ecotourism Centre of Dadia, 1998

Notes to readers

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