

CULTURE AND WETLANDS IN THE MEDITERRANEAN: THE CASE OF LAKE KARLA, GREECE

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Abstract

Wetlands are places, often unexplored, with unique natural and cultural values that are under threat from pressures ranging from habitat pollution to climate change impacts. One of the basic prerequisites for the sustainable management of wetlands is the commitment of human societies that comes from a strong sense of local identity and lifestyle, which is consistent with local ecological characteristics and seeks to challenge humans with regard to environmental ethics and social responsibility. While it is difficult to restore the ecological functions of degraded wetlands, it is almost impossible to restore, once lost, their cultural values. Lake Karla in the Greek Region of Thessaly was one of the most iconic Mediterranean wetlands, with very high biodiversity and vibrant culture especially in the local fisheries. Unfortunately, it was drained in the 1960s to provide additional agricultural land. The effects were catastrophic and resulted in a total loss of natural and cultural values without any benefits for the agricultural sector. A few years ago, the government decided to restore it at a very high cost, covered in part by the European Union. Apparently, it takes only a few years to destroy a wetland but it may take more than a lifetime to restore it. Managing and protecting wetlands is a challenge to which everyone must rise. However, allowing for ecological and social resilience to support biodiversity rather than trying to recreate the past maybe a sustainable way to restore certain ecosystem functions.

Keywords: wetlands, culture, restoration, conservation, sustainable management

Introduction

Wetlands are places, often unexplored, with unique natural and cultural values. Some wetlands have been intact for thousands of years; others have completely disappeared, while some have been altered due to natural and, mostly, human-related causes. Wetlands are under threat from pressures ranging from habitat pollution, excessive water abstraction, demand for agricultural land and other land use changes, urban and tourism development to climate change issues. Yet, a shared vision for wetlands usually does not exist mainly because their sustainable management is often confused with that of exploitation.

Wetlands are cradles of biological diversity, providing the resources and services (e.g. flood abatement, shore protection, raw materials, food, etc.) upon which countless species –including humans– depend for survival. The biota of wetlands consist mainly birds, mammals, reptiles, amphibians and fish. The presence of humans in such areas –either as fishermen, farmers, shepherds or hunters– can be traced back to prehistoric times. Also, major civilisations and cities such as Amsterdam, Bangkok, Tunis and Venice, have been established on their shores (Ramsar COP8, 2002). Wetlands are also economically important as they provide ample possibilities for farming, forestry, fishing, recreation and other productive or non-productive activities; yet, such possibilities remain largely misunderstood.

The diverse features of wetlands have been a stage on which issues of social relations have been played out over generations. The cultural aspects of wetlands, in particular, have added a new dimension to their diversity. In Greece, they can be found, *inter alia*, in mythology (deification of River Acheloos, nymphs in Lake Karla, etc.) archaeology (Neolithic settlements in Dispilio, Mycenaean tombs in Lake Karla, etc.), history (the Makedonian Struggle in Lake Giannitsa, the Greek Resistance during World War II in Lake Karla, etc.) folklore and intangible heritage (traditional fishing huts, architecture and local festivities), language (etymological names of lakes, rivers, settlements, etc.), arts (poetry, literature, photography, etc.) and recreation (rafting in River Aaos, bird-watching in Porto Lagos Lagoon, etc.) (Petrou, 2010).

The story of Greek wetlands since the early 20th century can be summarised in four distinct periods, i.e. 1925-1940, when several drainage projects were mainly destined to create new agricultural land, especially for the Asia Minor refugees, and ensure flood protection; 1948-1960, when further radical measures were introduced to increase cultivated areas and cope

with war-related issues; 1960-1995, when land consolidation became compulsory for all land properties within the territory of government reclamation projects; and 1995-present when the need to, first, dry and then restore a wetland has started to be questioned (Sivignon, 2007).

Specifically, Lake Xiniada in the Prefecture of Fthiotida (1924), Lake Giannitsa in the Prefecture of Pella (1937), Sari Giol in the Prefecture of Kozani (1951) as well as Lakes Mavri in the Prefecture of Preveza, Achinou in the Prefecture of Serres, Meliti in the Prefecture of Aitolokarnania and Aimatovou in the Prefecture of Kilis were drained during the 20th century. Further, the forest of River Nestos was destroyed in the 1950s to reclaim land for corn plantations, River Asopos and River Peneus are heavily polluted due to untreated industrial waste and agrochemicals, mass deaths of birds have been reported in Lake Koroneia due to a dramatic drop in water levels, whilst the notorious diversion of River Acheloos –that was planned 30 years ago– has never been sufficiently justified. In many such cases, the regional authorities are, in practice, powerless with only fragmented responsibilities, while many existing regulatory instruments are not properly implemented and monitored (WWF Greece, 2003).

According to the United Nations, sustaining cultures in terms of contemporary life is an issue of coexistence and progress rather than just a matter of preserving the past (Nadarajah and Yamamoto, 2007). Culture –though it includes traditions and customs– is, first and foremost, the changing dynamic of how people live their lives, individually and collectively. One of the basic prerequisites for the sustainable management of wetlands is the commitment of human societies that comes from a strong sense of local identity and lifestyle, which is consistent with an area's ecological characteristics, and seeks to challenge the wider community on environmental ethics and social responsibility (Apitz *et al.*, 2006).

Wetlands are vulnerable ecosystems and their wise management has passed the local level and became an issue with global dimensions (Papayannis and Pritchard, 2011). Such a process cannot be governed solely by legislation and regulation. Sustainable wetland management must materialise both on their tangible and intangible aspects (e.g. physical, aesthetic, historic, symbolic, etc.), which in turn can assist in overcoming the limitations of culture being understood as a thing of the past or associated with contemporary leisure contexts. What is important, then, is not only to realise how strategic initiatives may work but what vision of socio-cultural relations is revealed in their logic.

While it is difficult to restore the ecological functions of degraded wetlands, it is almost impossible to restore, once lost, their cultural values. What exactly has to be developed at the expense of the socio-cultural fabric? The drainage of Lake Karla did not sufficiently answer the previous question. The restoration of Lake Karla should attempt to answer it, though. Even if the delivery of formal apologies for harm done by government policies and practices could have provided space for socio-cultural healing, wounds will not heal if left unattended, meaning that the road to sustainability is a long and hardworking task. Key management decisions should, therefore, aim to establish efficient administrative procedures, utilise interdisciplinary scientific knowledge, develop innovative practices, avoid potential conflicts, promote public participation, education and training. Lake Karla's recent turbulent history should be mainly attributed to the fact that its distinct natural and cultural features have never been turned into levers of sustainable development.

Literary narratives

Lake Karla is located near the northern slopes of Mt Pelion in the Periphery of Thessaly, Greece. Thessaly's unique geographic relief (i.e. a basin-like shape) is the country's largest and most fertile plain. Tradition has it that Thessaly was once a large lake. Herodotus, Strabo, Archinoos and Euripides noted that there were two lakes, i.e. Nessonis and Voeveis (Karla), remnants of the great Thessalian lake. In more scientific terms, Thessaly consists a great inter mountain trough, which is not geo-morphologically united but separated to smaller plains. The region's wetlands were created after the immersion of Thessaly's basin and the separation of Mt Pelion from Chalkidiki Peninsula and Mt Othrys that took place during the Middle Pleistocene. Several points of interest are located in the vicinity, such as Mt Pelion (GR1430001), Mt Mavrovouni (GR1420006), Mt Ossa (GR1420003) and the Velesino-Karla-Mavrovouni area (GR1420004), which have been included in the European Network Natura 2000. Further, wildlife shelters include, among others, the Flamouri Monastery (18,000 km²) near Lake Karla and the forest of Palia Mitzela (24,000 km²) near Zagora (Kloutsinioti, 2009).

Lake Karla is tied with a large portion of Greek mythology, archaeology, history, religion and customs. The area, which used to be a sanctuary for several gods, demigods and heroes, such as Apollo, Hercules and Theseus, is directly connected to the Argonautic Expedition and the Trojan War. Further, the Neolithic settlements of Sesklo, the oldest such settlement in Europe, and Dimini had been inhabited since 7500 BC and 4800 BC, respectively. Archaeological findings in both settlements provide rich information about economy, architecture, production (wheat, barley, beans, peas and cattle breeding), pottery, jewellery, idol-making and other customs. In Lake Karla, the three (former) islets of Petra, Magoula and Sifritzali seem to have been inhabited by the same Greek tribes who founded Sesklo and Dimini. Also, a prehistoric settlement dating back to the late Neolithic Period, Hellenistic Age settlements and a Roman cemetery were brought to light during earthworks conducted within the framework of the Lake Karla restoration project (Region of Thessaly, 2009).

In 1766, the Patriarch of Constantinople Kallinikos III referred to some drainage works in Lake Karla, to eliminate malaria and reclaim land for agriculture. In 1831, Thiersch, a German scholar, advised the newly-established Greek State that in several regions agricultural land is being lost because of stagnant waters and such areas should be drained using canals and underground pipes. In 1809 Leake, a British topographer, stated that during the cold winters of 1778 and 1781 poor harvest led to famine in the villages around Lake Karla. Mezieres, a French historian, noted that Lake Voeveis, with its fisheries and clean waters, is the region's most beautiful wetland, contrary to the pastures that surround Nessonis swamp. Yet, land distribution was the main demand of the agricultural unions that appeared in Thessaly at the dawn of the 20th century. The farmers' revolt against the expulsion of land owners developed from a rural protest, which was initiated in the villages around Lake Karla, to a regional movement and resulted in the expropriation of the private estates (Region of Thessaly, 2009).

Even though for some Lake Karla was a useless swamp, full of diseases, its fisheries saved many people from starvation during World War II (Lefousis, 1995). The nearby streams of Danilis, Fragmeni Spilia and Papa-Pigadi as well as the Bampani, Trantos and Skylovrachos caves used to be the hiding places for many Greek bandits in the early 20th century as well as for Greek partisans during World War II. In 1943, the 54th Regiment of E.L.A.S. (Greek People's Liberation Army) was established on Mt Pelion whereas during the Greek Civil War (1945-1949) the area around Lake Karla was one of the partisans' main routes from south-eastern to northern Greece (Lefousis, 1995).

In 1964, when two-thirds of Lake Karla had been drained, 435,000 birds were recorded as part of the "Mid-winter waterfowl measurements" programme. This is the largest number of birds ever reported on a Greek, half-ruined, wetland and one of the largest on a European scale. At least 55 of those species would have been included in the Birds Directive (79/409/EEC) while, had it not been drained, Lake Karla could have been included in the Ramsar List of Wetlands of International Importance (Jerrentrup, 1990). However, Alamanis (1976), former Minister of Finance, argued that the lack of irrigation networks in Thessaly was the main reason for its underdeveloped economy, whereas new initiatives such as the construction of dams and the pumping of groundwater sources would result in the progressive increase in the number of irrigated fields, which in turn would lead to rapid economic growth.

Karla Lake used to cover an area of 45-180 km². From 1887 to 1953, more than 40 studies were conducted, most of which suggested that the lake should be drained (Nobile, 1914; Dimitropoulos, 1915). Lake Karla was drained in the 1960s to provide land for agriculture. Yet, the local society that depended on lake fisheries was destroyed, large populations of migratory birds disappeared, the area's microclimate was affected (i.e. decreased humidity levels, desertification, frost, land cracks, etc), a dramatic drop in the level of aquifers as well as the intrusion of salt water led to low agricultural productivity and land abandonment as the fields soon became salinated, while pollution from agricultural and industrial run-off, initially filtered by the wetland, caused serious eutrophication problems (severe algae blooms) in the nearby Pagasitikos Gulf (Ramsar COP8, 2002).

Lake Karla's restoration project was launched in 2000. It is partially funded by the European Union (3rd CSF) and aims at the sustainable management of the water resources, the enrichment of the water table and the maintenance of the area's ecological balance. The main core of Lake Karla's restoration project includes two phases. The first phase dealt with the study

and the construction of lake reformation works regarding the embankments of the lake, water-supplying canals, water collectors from torrents and pumping stations. The new 38 km² reservoir has been formed on the lowest end of the former wetland through the construction of two 9 m high dikes, i.e. the western (13 km long) and the eastern dikes (2.7 km long). Further, through the construction of four rainwater collectors (with a carrying capacity ranging from 325 m³/sec to 32 m³/sec), three pumping stations and drainage ring ditches, rain waters from the upper basin flow by gravity to the reservoir (Kanakoudis & Valatsou, 2011).

The second phase included the design and construction of water supply works from River Peneus, water supply works to the city of Volos, irrigation nets, flood prevention and control, artificial wetland formation works and complementary works. According to the assessed water balance of the reservoir watershed, the water volume supposed to supply the reservoir will not be enough to sustain the lake. Thus, additional water will supply the reservoir directly from River Peneus during winter (Kanakoudis & Valatsou, 2011). Further, the water supply management measures target to increase the availability of surface water in Thessaly not only by managing the surface water resources of the region through the development of dams and reservoirs but also by diverting water from the nearby River Acheloos basin to Thessaly through a series of dams and reservoirs (Loukas *et al.*, 2007).

Parallel to these activities, the Managing Authority of Lake Karla was set up in 2002. However, an agreement on the Authority's operational aspects was determined 4 years later, in 2006. The Greek Government granted the Managing Authority of Lake Karla with specific responsibilities regarding the water resources management, monitoring and management of the cultivated areas around the wetland, ecosystems management, recreation and environmental consciousness promotion activities (Kanakoudis & Valatsou, 2011). Lake Karla's restoration project has not so far delivered the anticipated results. Currently, the re-flooded lake is facing a number of sustainability issues ranging from the lack of water quality monitoring mechanisms to the uncertain future operation of the management authority.

Evidently, the effects of Lake Karla's drainage were catastrophic and resulted in a total loss of natural and cultural values without any benefits for the agricultural sector. The region's particular problem is common to those that present an inability to develop a new image. The history of Lake Karla reveals that local people have been partially removed from the connections to their communities and natural environment. Should a sense of place be absent, then sustainable management is impossible for it can only be achieved through the commitment of local people. Managing and protecting wetlands is a challenge to which everyone must rise. Allowing for ecological and social resilience to support biodiversity rather than trying to recreate the past maybe a sustainable way to restore certain ecosystem functions.

Contributing to wetland restoration

The broad Ramsar definition of wetlands encompasses, *inter alia*, lakes, rivers, marshes, oases, estuaries, salinas, chotts, underground karstic systems and other structures, including man-made habitats such as fish ponds and reservoirs. Also, the Ramsar Convention highlights the need to link the cultural aspects of wetlands, safeguard the wetland-related cultural landscapes, learn from traditional approaches and encourage cross-sectoral cooperation (i.e. Resolutions VIII.19 and IX.21). Applying innovative ideas for the protection of wetlands through capitalising on local natural and cultural heritage may give a window of opportunity for sustainable regional development. Even so, the Ramsar Scientific and Technical Review Panel states that the primary goal of any restoration project is to create resilient and sustainable ecosystems, as measured on a human timescale, in order to improve the ecological character and enhance the socioeconomic role of a given wetland (Zalidis *et al.*, 2004).

In 2007, Med-INA launched the project "Cultural aspects of Mediterranean wetlands", financially supported by the MAVA Foundation. During 2007 to 2010 considerable progress was made concerning the cultural aspects of wetlands and the wise management of these sensitive ecosystems. The work done by Med-INA also contributed significantly to the development of the Ramsar Guidance on Culture and Wetlands. A new project entitled "Culture and wetlands in the Mediterranean: using cultural values for wetland restoration", also funded by MAVA Foundation, was launched in 2011. It aims to strengthen restoration actions in wetlands using cultural values, apply and refine the Ramsar Guidance. Thus, three major wetland sites have been selected one in the East (Larnaka Salt Lakes, Cyprus), one in the South (Tunis Lagoon,

Tunisia) and one in the North (Lake Karla, Greece) Mediterranean. The challenge now is to demonstrate how cultural values, using the Ramsar Guidance, can contribute to the restoration of these wetland sites and to draw lessons from this experience.

With the Lake Karla case study, things that happen at microcosmic levels can be examined and the findings can be fitted in to more macrocosmic levels. The collection of first-hand materials and secondary sources, organised fieldtrips, networking and lobbying with key actors, feedback and consultations with local stakeholders assisted in defining the problem and developing a communication strategy. Such a methodological approach was adopted because it contributed to the identification of measurable objectives, the development of first proposals, the use of appropriate means for the dissemination of results and the continuation of stakeholder engagement. The research methods were essential in assessing the condition of the wetland, identifying reference ecosystems and selecting a number of characteristic trekking routes that embrace issues such as local fauna and flora, archaeology, history, religious sites, traditional activities, local products, cultural and aesthetic landscapes, etc.

Lake Karla used to be one of the most iconic Mediterranean wetlands, with very high biodiversity and vibrant culture especially in the local fisheries. The management goals of wetland restoration can vary, e.g. redress ecosystem damage created by human activities, maintain or recover species and habitat loss, restore ecological integrity, maintain ecosystem services, restore culturally important nature, protect and reinforce traditional and indigenous cultures, etc. However, integrating natural and cultural aspects into wetland management plans may lead to more sustainable strategies for the benefit of both nature and humans.

In Lake Karla, quality alternative tourism can act as a safeguard measure (i.e. avoid loss of local identity and authenticity, cultural erosion, etc.) for its wise management. Carefully managed, small-scale tourism developments where the locals would be in control can foster sustainable development by enabling local communities to improve their well-being, maintain their traditional socio-cultural values and promote them as part of the local identity. Appropriate types of alternative tourism for an area such as this are ecotourism and cultural tourism that interpret and promote the local natural and cultural environment. These types of tourism can include activities such as cultural ecotours, fishing, caving, hiking, gastronomy and other nature and culture oriented facilities or services. In this context, Lake Karla can be the marketing vehicle as long as it is portrayed as a guardian of local culture and nature.

Small numbers of tourists are currently visiting the site due to, *inter alia*, poor infrastructures, lack of knowledgeable tourism service providers, a lack of a common vision and development strategies. Partnerships are always important in overcoming such barriers and this is especially true in small, remote communities where they may not have the resources to plan and promote themselves. To improve the situation and work towards an integrated approach, Med-INA is closely cooperating with the regional authorities, local communities and other key stakeholders. The planned activities include inventorying the area's natural and cultural heritage, disseminating this knowledge in appropriate forms (e.g. through a walking guide) and introducing the cultural aspects of the area in the international SIGMA for Water¹ project in collaboration with the Department of Engineering of the University of Thessaly, ensuring their incorporation in the final proposals. These activities guarantee local stakeholders participation and aim to attract and sensitise visitors, invigorating interest and the local economy.

An innovative walking guide, in particular, can assist in the development of alternative types of tourism and, ultimately, promote sustainability. In the longer-term, it can contribute to developments that will be in harmony with the local nature and culture, e.g. creation of opportunities for leisure and recreation (including visitor facilities, pathways, walking trails, cycle routes, signing and accommodation), enhancement of the area's biodiversity, promotion of the area as an attractive place to live and do business. Further, initiation of environmental education programmes in the area designed to encourage schools and other social groups to visit the area can play a catalytic role in the site's sustainable future.

Discussion

Contemporary society has begun to express an interest for areas with distinctive natural and cultural characteristics. This increased demand may affect wetlands in altering these diverse characteristics. Yet, it is those features that should be branded in order to promote locality as a lever for sustainable development. To this effect, new initiatives must consider ways to engage a wide range of local stakeholders in the planning and decision-making processes, and develop a shared understanding, e.g. active involvement of local communities in identifying and understanding the values and vulnerability of wetlands, awareness raising campaigns, establishment of wetland observatories, pilot projects on rehabilitating degraded wetlands in urban, agricultural, commercial, industrial, insular and other regions, utilisation of related experiences from different parts of the world, etc. (Dodouras *et al.*, 2009).

A key lesson is the need for strong political backing at all levels. The trans-boundary Prespa Park in Greece, Albania and FYROM, as well as the national wetlands of Zaranik in Egypt and Sečovlje Salina in Slovenia, have become models of nature conservation, mainly because of the common interest and commitment of all stakeholders, including local and central authorities. Another lesson is that effective management of wetlands is extremely important. Several wetland sites have the rare advantage of having locally established management bodies, e.g. Butrint in Albania, Skocjan Caves in Slovenia, Doñana in Spain and Camargue in France. The partners of such bodies include specialists on various disciplines, whereas their management plans respect the integrity of the sites and look carefully at all aspects of site management, including both natural and cultural heritage (Papayannis, 2008).

Human societies that live around wetlands may differ in terms of cultures, historical experiences, vulnerability to external interventions, ecological fragility, etc. However, they share some common concerns including isolation, transportation problems, tourism related issues, emigration, and the need to preserve the local culture and identities. Conflicts can arise from the lack of a set of robust criteria to appreciate wetland values and the inability to consider them as "capital" rather than "luxury good". Thus, management strategies in Lake Karla should focus on the need to incorporate scientific knowledge with values and aspirations of the local community. Yet, one of the main hurdles to its sustainable management is the confusion about the roles and responsibilities of all involved stakeholders.

Whatever the management needs of such areas maybe, the consultative process is very important in order to provide space for all voices to be heard and examine the sustainability priorities that would guide decision-making. In Narta and Kune-Vain Lagoons in Albania, Burullus Lake in Egypt, Orbetello in Italy and Santo Andre in Portugal, for example, efforts are being made to record, safeguard and use traditional knowledge in a creative manner to the benefit of wetlands (e.g. production of quality agricultural goods, ecotourism, gastronomy, etc.) as key assets in the fight for global competitiveness. Certain activities that are being –or have been– abandoned may be maintained or re-established while they can also provide useful guidance for contemporary methods of wetland resource uses in agriculture, fisheries, stock-breeding, craftsmanship or freshwater management (Papayannis, 2008).

The local community of Lake Karla must realise that further development should simultaneously provide long-term employment and business opportunities (e.g. animal farming, tourism, alternative energy schemes, etc.) and build on community values rather than adversely impact on them. This includes protecting the wetland from several threats that relate to the diversification of land use, loss of agricultural areas, illegal hunting and potential tourism expansion that may cause noise, littering and loss of scenic areas. In the case of Lake Karla, effective participation along with technical expertise can guarantee that similar initiatives are not just being planned but also being implemented on the ground.

The promotion of educational activities, as proven by the cases of Skocjan Caves in Slovenia, Sidi Boughaba in Morocco, and in the Rainier, Rocky Mountain and Great Smoky Mountains US National Parks, can provide positive results for the wise management of such sites. Further, cultural events play an important role in strengthening the identity of the communities living near wetlands and, at the same time, attract quality visitors. Such events are aggressively marketed as tourist attractions as demonstrated, for example, in Neretva Delta in Croatia, Hutovo Blato in Bosnia-Herzegovina and Albufera de Valencia in Spain, which contribute significant income to local people (Papayannis, 2008).

¹ Sigma for Water is a project within INTERREG IVC program with 11 partners from 8 European countries. For more information, visit <http://www.sigmafwater.org/>

Lake Karla does not seem to form an integral part of the local tourism industry. Interestingly enough, there is not a single road sign guiding visitors to the site, not to mention the minor and/or scattered references about the area's natural and cultural heritage in the majority of the literature. Major biotic and abiotic changes were registered due to abandonment of traditional activities, whereas the issues of structural unemployment and domestic migration are still at large. In Lake Karla broader folklore events related to local customs can play a key role in reinforcing the relationship between humans with their wetland heritage and, thus, strengthening conservation efforts. A great challenge is whether they can be adopted by local societies and thus gradually become a permanent part of local traditions.

Conclusion

Wetlands are subject to diachronic natural influences whereas the proliferation of archaeological and historical sites around wetlands indicates the intimacy of people with them. Wetlands are "places of memory" –with both tangible and intangible elements– that people use in order to give meaning to the world they live in. Yet, it takes only a few years to destroy a wetland but it may take more than a lifetime to restore it. Mono-disciplinary approaches could result in deceptive outcomes, meaning that they could be improper tools for decision-making. Who is, for example, to assign the importance to the key features of a wetland? What values are to be considered in establishing the priorities to be ascribed to a wetland? What mechanisms should facilitate research, planning and decision-making with regard to these priorities?

The perception that wetlands –even those artificial ones that were created purely for economic reasons but gradually became important ecosystems– form an integral part of the world's natural and cultural heritage is now growing strong. Therefore, strategic wetland management should not be based on short-term, rear-view development plans but rather the focus must be on integrated approaches that point to the interface between nature and *anthropos*. The ecological parameters of wetlands cannot be managed, unless the human culture that shaped them, is appreciated.

In Lake Karla, key stakeholders have been investigating –though mono-disciplinarily– the subject-matter and its pertinent aspects extensively during the last few decades. Also, local citizens are unaware of how the situation is developing and sceptical of not being actively involved in the planning and decision-making processes. Looking to the past as an example of a healthier, more sustainable human-nature relationship carries little merit for the community today. Any future intervention should have culture, nature and local people at the forefront in order to promote a strong local profile and efficiently cope with the so-called development deficit.

Usually, the causes of environmental problems are related to culture-specific human behaviours, values, norms and needs (Casimir, 2008). Complex situations may present local communities with opportunities that have to be turned into success stories. Wetlands enhance landscapes, regulate microclimate, foster biodiversity, strengthen area values and image, support the tourism industry and provide additional income and jobs. In Lake Karla, such special features should form the basis for development that is sustainable.

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