Tourist Routes, Environment and Local Production in Fragile areas. 
The Case of Wetlands in Sardinia

Andrea Corsale (University of Cagliari, Italy)  
Monica Iorio (University of Cagliari, Italy)

1. Introduction

In recent years, various programmes at different levels aimed at involving regions and municipalities in planning development interventions in order to improve production, resource management and local knowledge through cultural and ecological tourism linked with business activities. In a certain way, it seems to be a matter of “locality production”, according to the well known definition of Arjun Appadurai (Appadurai, 2001). These development interventions are linked to the evolution of geographical, sociological and economic thinking and to the ongoing sustainability debates. What emerges from these interventions for local development is the importance of landscape, folklore, traditional crafts and food in order to compete for tourism in the global economy, using them as symbolic meanings related to their cultural specificity.

This consideration particularly applies to fragile areas of transition, such as coastal wetlands, where the mechanism of value allocation has to move from destruction (e.g. draining of swamps, exploitation of water), to conservation (e.g. Ramsar Convention), to “sustainable tourism”. The topic of tourism related to wetlands has been investigated in recent years as a possible contribution to the search for alternatives to seaside mass tourism. Socio-economic development in fragile areas tends thus to be more and more associated with local heritage with its complex anthropological and social characteristics, in its tangible (such as boat building and fishing techniques) and intangible (religion, arts, gastronomy) aspects, within a process where it is necessary, and not always easy, to understand the roles and powers of stakeholders. The aim of this study is therefore to present the process of tourism development in the wetlands of Sardinia, focusing our attention on the current opportunities and threats, through the interesting experiences of Cabras and Tortoli.

2. Connections

The cultural policy of the European Union tends to be adjusted, at the local level, through complex processes led by political elites and cultural organizations together with institutional bodies, media, training, etc (Abélès, 1992; Therborn, 1993). Today, the diversities in environmental, cultural and economic features are generally considered a resource and an asset for local development, rather than an obstacle to the development of national communities and the presence of a strong intellectual and political tradition that could be described as “regionalism” in the Mediterranean.
countries of Western Europe is close to this approach (Chiva, 1992; Fabietti, 1995; Schama, 1997; Shore, 2000).

Europeans seem therefore to feel a sense of identity and belonging that goes through a perception of political space in concentric circles, where the smallest circle represents the local and regional one, followed by the national and the European identities (Palumbo, 2003).

Local museums, in particular ethnographic museums and ecomuseums, as well as cultural and natural monuments and sites, agro-food products and traditional or renewed crafts, represent dense and varied paths used by cultural policies, at different levels, in order to create, promote or diversify tourist destinations. This choice triggers a process of “locality production” which involves political (municipal, regional and national governments, European Union) and economic stakeholders (entrepreneurs, associations and groups often supported by universities and research centres). These mechanisms tend to create strong ties among physical places and tourist images. This is particularly evident for agro-food products and crafts that become “cultural objects” and symbolize the resources of specific places. These products are loaded with meanings that refer to a widespread idea of “tradition”, “authenticity” and “natural”, in order to distinguish them from other contexts where cultural heritage tends to be exploited as a commodity (Hannerz, 2001; Papa, 1999; Piermattei, 2007; Siniscalchi, 2000; Vallerani, 1997).

3. Places

The institutional action for the local socio-economic development tends to assign new functions to historically marginal areas. Wetlands are an emblematic case which shows that the conditions of an ecosystem directly depend on the perception that human societies have about it (Fustec and Lefeuvre, 2000).

The concept of wetland goes back to the Ramsar Conference of 1971 whose final document ratified the definition of wetlands as “areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres”.

Most of these different kinds of wetlands, which have often been deeply transformed by human activities, are still widespread in the Mediterranean region. These are areas of great importance from a hydrogeological, chemical-physical, productive, biological and ecological point of view. Besides a rich and varied vegetation, the fauna is represented by invertebrates, reptiles, mammals and many species of fish, some of them periodically migrating among deep seas, coastlines, rivers, lagoons and ponds. However, wild and migrant birds are the real protagonists of wetlands, and birdwatching has become a metonymy for all education, leisure and cultural operations that are related to these areas (Della Pietà, 1999).
The Italian government ratified the Ramsar Convention in 1976 and included in the list 46 areas, 8 of which are located in Sardinia (with a total area of 12,570 hectares), mainly concentrated along the coast of the provinces of Cagliari and Oristano.

The protection of wetlands has also been encouraged by the Directive 79/409/EEC “Birds”, and by the Italian Law nr. 157/1992 on the protection of wild birds, which prescribes the adoption of conservation measures for all species of birds, particularly for endangered species. EU Member States were thus required to designate the most significant territories for the conservation of these species, classifying them as Special Protection Areas (SPAs). Many wetlands scattered along the coastline of Sardinia also benefit from several other layers of protection (SPAs, Ramsar sites, Regional Parks, Sites of Community Importance).

Sardinia offers a wide range of these fragile environments through a crown of coastal ponds and lagoons that covers a relatively large portion of its coastline and numbers some examples of internal wetlands, too, such as on the pauli on the plateau of Giara di Gesturi.

From a morphogenetic point of view, Sardinian wetlands can be divided in four main different types (Mori, 1975):
- ponds located at the mouths of rivers as a result of water accumulation behind complexes of sand dunes;
- ponds located within headlands or islands connected to the mainland by accumulation of sediments;
- ponds located in coastal areas affected by the subsidence of the Campidano plains;
- lagoons periodically separated from the open sea.

4. Enhancement

The attitude of the Mediterranean peoples regarding wetlands has evolved over the centuries and it profoundly changed in very recent times (Stoch F., 2004). According to an ancient vision, wetlands were perceived as a symbol of putrid, dangerous and unhealthy environments, sources of miasma and linked with diseases and epidemics, particularly malaria.

Only after the Second World War malaria was finally eradicated from the Mediterranean countries, but the general recognition of the ecological, cultural, educational, recreational and tourist importance of these areas is even more recent. As a result of this new perception of wetlands, new stakeholders are interested in its protection at local and international levels (e.g. Ramsar Convention and MedWet programme).

As previously stated, Sardinia has a great variety of wetlands covering a total surface of over 12,000 hectares, out of a regional surface of 24,090 km$^2$, which represent the remnant of a much greater system which largely shrank during the XIX and XX Centuries.
In the Southern coast, within the metropolitan area of Cagliari (over 400,000 inhabitants), several large wetlands are located: the pond and salt flats of Molentargius, the lagoon of Santa Gilla, the salt marsh of Macchiareddu and the pond of Capoterra. This vast system, listed in the Ramsar Convention and partly protected by a Regional Park, constitutes one of the most important in the whole Mediterranean region and one of its most famous birds, the pink flamingo (Phoenicopterus roseus), is now one of the best known symbols of the city of Cagliari.

Around the South-Western tip of the island and along the coast of Sulcis the wetland landscape is represented by the lagoon of Nora, the wide ponds of Is Brebeis, Porto Pino, Maestrale, Santa Caterina and Bau Cerbus and the salt marsh and lagoon of Punta S'Aliga.

At the centre of the Western coast of the Island, the Sinis Peninsula and the semicircular Gulf of Oristano are bordered by many wetlands which present varied features in terms of geomorphology and water circulation. A larger system of ponds and lagoons was completely drained during the 1930s and 1940s and turned into an intensive agricultural area, within one of the most famous development projects of the Italian Fascist regime. From South to North, the surviving wetlands are the lagoons of Marceddi and San Giovanni, separated from the sea by large hydraulic engineering structures, the open lagoon of Corru S'Ittiri and the ponds of S'Ena Arrubia, Santa Giusta, Pauli Maiori, Cabras, Mistras, Is Benas and Sale Porcus, which, in spite of the destruction caused by the State agricultural colonization in the XX Century, still represent the third largest in Italy (after the Po Delta and the salt flats of Margherita di Savoia in Apulia), partly protected as Ramsar site, SPA, SCI and Regional Park.

The remaining part of the Western coast is mostly characterized by high cliffs with only one wetland, the pond of Calich, located north of Alghero, partly drained during the XX Century for another intensive agricultural project run by the State.

Along the Northern coast of the Island the presence of ponds is limited to the Western sector, with the ponds of Pilo and Cesaraccio, near the peninsula of Stintino, and Platamona, bordered by an artificial pine grove planted by the Fascist regime, which significantly altered the natural sand dune environment.

The North-Eastern coast, between Santa Teresa di Gallura and the Gulf of Orosei, is surrounded by wetlands of modest size, among which the lagoon of San Teodoro, with its famous blocks of granite, and the pond of Longu.

At the centre of the Eastern coast the pond of Tortoli is the largest and richest in fish. Around the South-Eastern tip of the Island the main wetlands are the ponds of Murtas, S’Acqua Durci, Saline, Colostrai, Feraxi and Notteri (Cavallo, 2007).

All of these areas are threatened by rapidly growing anthropic pressures, as a consequence of urbanization and seaside tourism development.
While in the ancient and Roman time the coast of Sardinia hosted rich urban communities linked to the outside world by flourishing international trade, during the Middle Ages a deep demographic, social and economic crisis caused by misgovernment, barbarian invasions, pirate attacks and malaria led to the abandonment of most of the coastal areas. As a consequence, the surface covered by wetlands expanded until the XIX Century, when the drift started to change again. During the XX Century, the migration trend of the population from the inner areas of Sardinia back to the coast caused intense urban expansion accompanied by industrial and tourism development. This produced environmental stress and worsened the already negative impacts caused by some forms of traditional economic activities, such as sheep farming.

As a consequence of decades of monothematic promotion, tourism in Sardinia is strongly associated with seaside attractions and activities, characterized by high seasonal concentration in the months of July and August. Coastal municipalities host 50% of the total population and almost 95% of tourism
supply (Gentileschi, 1991).
In spite of these weaknesses, threats and challenges, the case of Sardinia is particularly interesting because the survival of large natural areas can still be associated with the promotion of cultural heritage and wiser distribution of tourist activities, providing significant opportunities for local development in a regional context of persistent economic marginality, population decline and ongoing crisis of the traditional agro-pastoral system.

5. Old and new functions
In the old times, the richness in fish resources was the only positive side of living next to a wetland. The tradition of fishing in the coastal ponds and lagoons strictly depended on local geographic features, leading to the development of extensive know-how through the long-term struggle to control and manage the morphology and hydrologic regime of wetlands.
In the coastal area of Oristano, for example, semi-artificial connections link the ponds to the sea since very ancient times and local fishermen traditionally use boats of reeds called “fassonis”, whose origins can be traced back to the Phoenician time, which are able to slip and float into the wetland vegetation and on shallow waters without damaging the ecosystem. The fassonis are emblematic of an ingenious and sustainable use of local resources which contributes to a rich ethnographic heritage.
Fishing activities have been indicated by the Regional Government as a possible link among different forms of tourism. Fishing tourism has been defined by the Regional Law as “accommodation and recreational, educational and cultural activities and services related to a sustainable use of aquatic ecosystems and wetlands, fishery resources and aquaculture, through the enhancement of socio-cultural aspects of fishing enterprises, breeding and conservation of fish” (D.D.L. nr. 154, 2004.). The promotion of tourism related to fishing, farming and conservation of fish is thus expected to lead to the development of rural tourism within traditional fishermen communities and to the restoration and reuse of abandoned buildings that are related to dismissed fishing activities.
This form of tourism in Sardinia is currently in an experimental stage. During this stage it is still not possible to spend the night in the traditional fishermen huts and shelters because they were often built with poor materials and would require structural transformations that would completely change their nature.
This means that fishing tourism is mainly related to providing food based on fresh or processed fishery products. Among the products from the Sardinian coastal ponds and lagoons, mullet roe, also known as botargo or botargue (“bottarga” in Italian), is by far the best known and most renowned. Promoting the consumption of specialty products from the ponds and lagoons can thus
help to support the complex system of natural and human features that forms these peculiar environments. These “humanized” aquatic landscapes need wise maintenance and promotion, as visitors must be brought to understand that the landscape and the surrounding area are closely related to the food that they taste. In order to appreciate this added value, visitors need decoding cultural instruments: from this perspective, micro actions at the local level can be strengthened through additional forms of territorial marketing involving the product (“taste itineraries and routes”, “flavour maps”, etc.). The adoption of strict policies regarding product tracking, certification and trademarks, also through the classification and valuation of agro-food products (DOP, IGP, “slow food”) could further increase the appeal of this kind of tourism and provide high standards of food quality for the customers (Lai, 2007).

Besides food, wetland tourism in Sardinia tends be associated to a wider range of activities, usually regarding cultural heritage, sport and education, as in the case studies of Cabras and Tortoli. Longer stays tends to be more often associated to nature tourism, particularly birdwatching, mountain-biking, horseback riding, scuba-diving, canoeing and hiking. Some strong nature-theme itineraries have already emerged, such as the excursions that lead from the Sinis Peninsula and the Gulf of Oristano to the internal plateau of Giara di Gesturi, internationally known for its flora and fauna, particularly for its population of wild horses.

6. Conflicts

The WWF and LIPU indicate intensive agriculture, hunting, overfishing, exploitation of water resources, organic and chemical pollution, industrial risk, urbanization, tourism growth and abandonment of traditional activities as the main threats to the preservation of wetland ecosystems in Sardinia.

While the era of wetland draining seems to belong to the past, destructive works are still being done in several parts of the Island, especially where water shortages or floods led or are still leading to heavy transformations of water circulation (e.g. dams and canals) or where other land uses are given priority (roads, ports, second homes).

On the other hand, being wetlands the result of complex interactions among natural dynamics and human activities, some interventions are needed in order to keep these ecosystems balanced and vital. The control of continental inputs (water and sediment), the maintenance of river and lagoon mouths, the monitoring of internal circulation and the regulation of water exchanges with the sea are all essential activities to ensure the normal migration of fish between the sea and ponds and the conservation of the environment as a whole (Cavallo, 2007; Sechi, 1983).

The Sardinian coastal ponds are affected by many forms of pollution that often undermine their trophic status. The abnormal increase in fertilizing substances, mainly coming from areas of
intensive agriculture and farming (including cattle and sheep farms) causes severe eutrophication. The lagoons of Santa Giusta, S'Ena Arrubia and San Teodoro have repeatedly recorded large-scale mortality of aquatic fauna in recent years.

The discharge of chemical pollutants can also cause serious and persistent negative impacts, particularly when heavy metals and organochlorines enter the food chain. The petrochemical complex of Sarroch, near the lagoons of Santa Gilla and Nora (Province of Cagliari), or the chemical and metallurgical pole of Portovesme-Portoscuso, near the lagoon of Bau Cerbus (Province of Carbonia-Iglesias), are perhaps the most striking examples of conflicts between industry and environment in the Island. The discharge of waste materials from mining activities is another aspect of the problem, as, in many parts of the Island, some rivers and streams currently carry heavy metals drained from abandoned mines into lagoons, as in the case of Marceddi. Chemical pesticides and wastewater produced by cheese factories and oil mills are also locally serious problems.

Besides agriculture and industry, other serious damages can also come from urban landfills, illegal waste dumping sites and untreated wastewater coming from urban areas and tourist resorts in the summer peak season. The lack of knowledge on the natural and cultural importance of wetlands also leads to other destructive actions, such as real estate speculation or car parking at the edge of ponds and lagoons (Cannas, Cautadella and Rossi, 1998).

7. New experiences: Cabras and Tortoli

The sustainable use of coastal ponds in Sardinia, including tourism development, can not be cut from the wider territorial context, as it is unlikely that ponds by themselves can become strong tourist attractions in the low season, which is one of the main aims for the future economic development of the Island. While accommodation capacity is still concentrated in the main tourist resorts, alternative accommodation, such as agrotourism, historic guesthouses and bed and breakfast, is more equally distributed and rapidly growing and could better provide a support for ecotourism. In some cases wetlands are located near other cultural and natural sights, which would favour the promotion of territorial systems and tourist routes with stronger implications for local development. Salt flats are an interesting example of such opportunities, with their historical, technical, environmental and sanitary connotations. For example, one of the main wetland-related development projects, named “Salt City”, is currently underway in the vast salt flats of Poetto, within the urban area of Cagliari and the Regional Park of Molentargius - Saline, where the development of environmental education and thalassotherapy have been chosen as the first actions.

7.1. Cabras: from feudalism to modernity
With its 3,575 hectares, the lagoon of Cabras is the largest in Sardinia. Its configuration and complex water dynamics make this environment particularly interesting for its unique hydrobiological features and for its rich flora and fauna. The lagoon is part of a larger system of wetlands located along the shores of the Gulf of Oristano and in the peninsula of Sinis, whose marine ecosystem is protected by a national Marine Protected Area (Area Marina Protetta). The lagoon of Cabras was included in the Ramsar Convention in 1978. The economic activities of the local population have always focused on fishing, agriculture, handicrafts and sheep farming. For many centuries the management of the lagoon and its fish resources was done according to feudal law. This rigid and hierarchical system of authorizations and archaic rules survived until the 1960s. A rich heritage of fishing techniques and traditions, such as the wooden fishermen shelters and the typical reed boats used since ancient times, had survived along with unfair labour conditions, causing serious social conflicts (Fiori, 1961).

The end of this age led to the establishment of small fishing co-operatives which did not have enough experience about how to scientifically manage the wetlands environment. Moreover, the rapid industrialization of the area of Oristano, the growth of intensive agriculture and the insufficient wastewater treatment heavily modified the ecosystem causing severe fish mortality crises throughout the 1980s and 1990s (Manca Cossu, 1990).

This disastrous situation led the fishermen to find new forms of cooperation through the creation of a larger consortium including the fishing co-operatives, with their 300 members, and the Municipality of Cabras itself, in order to undertake a major process of diversification of activities: new fish products, modern product marketing and tourism related to fishing. The latter has proven to be a new major source of income, with over 1 million € and 45,000 customers recorded at the local restaurant in 2007. New side projects include environmental education, a fishing museum and international co-operation with Brazil, Mauritania and Senegal, in order to strengthen the production of botargo, which is by far the most valued local product.

7.2. Tortoli: new activities in a marginal area

The experience of the pond of Tortoli, managed by a local co-operative of fishermen, is particularly significant as it shows the complex dynamic relationships between coastal wetlands and the local socio-economic context. The pond currently has a surface of 230 hectares but it underwent large morphological changes over the centuries. Historical sources show that in Roman times it was a port open to the sea, while the present pond formed by progressive accumulation of sediments favoured by complex hydrogeological processes. The area was managed according to the feudal law until the early XIX Century, then it was
nationalized and managed through fishing concessions granted to individuals until the early 1950s. During this long period, the stability of the wetland was guaranteed by the freshwater inputs coming from tributary rivers. From the 1960s, conflicts with agriculture and industry arose. The rapid industrialization of the area began to seriously affect the wetlands, particularly damaged by the nearby paper factory and by the construction yard for oil platforms. The construction of two canals connecting the pond to the sea produced deep transformations, worsened by the reduction of freshwater inputs caused by the construction of a dam upstream, intended to ensure water resources for irrigation. Deep ecological changes, such as the increase in the presence of marine species, produced further impacts on the ecosystem.

A the same time the fishermen co-operative, with its 50 members, has managed to consolidate fish production, including mullet roe, distributing it to the local market and to the city of Cagliari, from where it is partly exported. The growing attention for tourism development as a support for fishing activities led to the opening of a restaurant, included in the Regional register of agrotourism, which reached 50,000 customers in only one year (2007). The income of the co-operative thus grew to over 2 million € per year and is exploring new side projects, such as environmental education and international collaborations (with Brasil, Senegal and Tunisia), in order to diversify its activities while strengthening its link with fishing. The average age of its members is 38 years and has not significantly increased over the past 10 years, showing the entrance of local young workers, in spite of rapid ageing of fishermen’s average age in most of the Mediterranean region.

8. Outlook
The recovery of European memory, history and heritage, both tangible and intangible, tends to be associated with the creation, promotion and reinforcement of tourist routes strongly associated with local landscapes, history, food and crafts, involving more and more actively regional and municipal administrations. In recent years, for example, the Leader and Leader Plus programmes, funded by the European Union, aimed at involving regions and municipalities in the elaboration of development interventions to improve production, resources and local knowledge by stimulating cultural and ecological tourism and related business activities. Rural communities and micro-regions thus tend to add to the landscape symbolic meanings related to their cultural specificity, in order to sustain their local resources in the international competition (Abram, Waldren, MacLeod, eds., 1997; Appadurai, 2001; Hannerz, 2000; Robertson, 1999).

The experiences of Sardinian wetlands, particularly the cases of Cabras and Tortolì, show that the integrity of a wetland depends on the vitality of the economic activities linked to sustainable fishing, in order to preserve the historically symbiotic relationship between man and the lagoon.
(Turco, 1983). For this to be achieved, it is essential that local communities and stakeholders be provided with the cultural tools, information and training that are the real basis for the conversion of wetlands from simple exploitation areas into systemic resources. Several positive experiences and best practices confirm that it is still possible to merge conservation of wetlands and local development. Local blends of rural, gastronomic, sport and nature tourism can thus provide new chances in order to transmit fishing traditions from older to younger generations of fishermen. Opening these communities to the outside world can therefore help to preserve and strengthen their specific identities and the balance of human and natural features that shape most wetlands in the Mediterranean region and in other geographical contexts. The revitalization and rediscovery of traditional methods of fish processing and extraction of salt can also attract educational tourism, in different and varied combinations that depend on the history and resources of each area. These forms of local development can thus find new ways to reinforce ecological networks and stimulate new sustainable solutions to socio-economic marginality.

References
Fiori G. (1961), Baroni in laguna, Edizioni del Bogino, Cagliari.
Hannerz U. (2001), La diversità culturale, il Mulino, Bologna.


