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Comment

The Delta Regional Park and Citizens' Participation

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Introduction

The Regional Park of the Po River Delta[1] was set up in 1988 (it belongs to a Consortium of Public Bodies). It extends over 54,000 hectares of land and stretches across 45 km of the Italian Eastern coastline (45 km of the more than 90 km that go between the provinces of Ferrara and Ravenna)[2] and is one of the largest and most significant natural parks in Italy. It is connected to the Regional Park of the Veneto Region, which is situated North of the Po Delta and protects a further 120 km of wetlands, from an environmental, economic and landscape point of view.[3]

Within the borders of the Park are to be found rare and diverse types of habitat: fresh and salt water wetlands, forests, woodlands and pinewoods, beaches and dune formations – overall, an environment that offers many possibilities for survival and reproduction to the fauna of the area. A total of 374 vertebrates have been identified in the Park; the bird species alone constitutes an exceptionally valuable patrimony for the Park – more than 300 types have been spotted in the past few decades, including 146 nesting and more than 151 migratory birds, making the Park the foremost ornithological area in Italy and one of the most salient in Europe.[4]

A characteristic of all of the distinct habitats is that they are coastal environments or influenced in some way by the dynamics of the coast. The "Transit Zone" between the brackish waters and those of the Delta is, historically, the element that connects the entire area, despite it being varied. But with the increase of settlements in the area (residents within the Park's borders amount to 40,000, and 250,000 local municipalities have been incorporated in the territory, without taking into account the millions of people who descend on the Park to bathe during the tourist season), an extended and extreme form of urbanization has occurred; thus, in the past few years, the habitats have been cordoned off. As a result, the dynamics of natural evolution have been stemmed, thereby endangering environmental continuity and the ecological succession that extends from the hinterland to the coastline.

"A large number of the natural processes that led to the creation of these extraordinary ecosystems have today seen their natural evolution inverted. Their ecological continuity, in particular between the coast and hinterland, but also between the various habitats themselves, has been endangered by a senseless kind of urbanisation and instable, and often contradictory, administrative and management procedures", reads the Executive Project of the Master Plan of the Park Coastline.[5]

Such problems are present in many European coastal areas.[6] They have worsened because of climate change that, along with natural and man-induced subsidence, is threatening the survival of massive stretches of coastland and the lives of those living there.[7]

GIS for participation

The Master Plan is a fundamental tool for the Park. It may not be legally binding, but it should be the reference point for every undertaking, to ensure the conservation of the habitats and to favour a sustainable economic development. In such a context, the participation of the stakeholders, their informed and active involvement in the decision-making process, is of great relevance.

The tool to be adopted for the creation of a broad and inter-disciplinary map of the Park that determines its current territorial extension, that identifies the problematic points and the incompatibility between human development and natural evolution (information that will give way to the formulation of

management and operational guidelines) is, according to the Master Plan of the Park, a GIS, a Geographical Information System. GIS must meet "the need to construct an evaluation system that places emergencies above critical issues, and to ensure the harmonious development of the territory, keeping in mind the environmental resources involved".[8]

Applying the System means gathering data (geographical coordinates) relevant to all biotic and abiotic fields: from zoology to geology; from the economy to urban planning. Numerous researchers of the Universities of Bologna and Ferrara will be involved, as well as experts in environmental management and territorial planning from various organizations and institutions. Other than for the creation of a descriptive territorial data-bank (relational by nature) to define the management guidelines, GIS is deemed useful by the Executive Project for the "dissemination and sharing of geographical data by means of the most scientific telematic communications systems".[9]

The active participation of stakeholders and citizens is reiterated, in many different ways, in all the documents of the Master Plan. Their inclusion has now become widely accepted and highly recommended when specific, complex scientific issues are at stake that might influence political, social and economic choices; it becomes imperative when citizens feel at risk. Unfortunately, with general consent of the formula of active participation comes a multitude of multifarious methods to launch it. And what is worse, the variety and complexity of real situations, and the unexplored aspects of this field of studies, means that sound models cannot be unearthed beforehand.

In the case of the Master Plan, communication of and involvement in issues will predominantly be based on the dissemination of the guidelines and the accessibility (defined according to suitable access policies) of scientific knowledge "stored" in GIS that regards both socio-economic elements as well as risk factors (e.g. coastal erosion, overflowing rivers, frequent and violent sea storms that are dangerous for both people and their possessions).

Mapping the future

"The ability of individuals and social groups to 'map', in an in-depth geographical way, their vision of the future is a fundamental prerequisite for sustainable and informed planning." Steve Carver of the University of Leeds uses this statement to explain the potential of GIS as a tool favouring participation.[10]

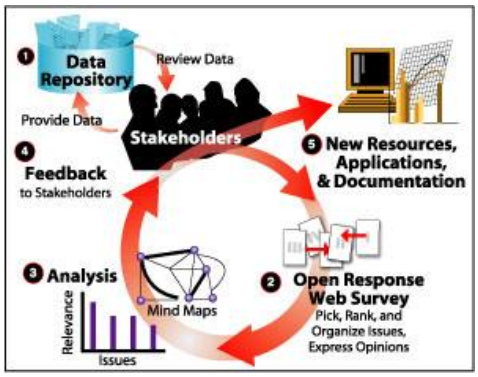
According to the above statement, which underscores the highly evolved debate in Anglo-Saxon countries,[11] decision-making based on GIS allows stakeholders to analyze a problem using the data available, experiment with feasible solutions, understand the views of others and create and share new ones in and with an extended community.

The chief aspect of GIS is that it helps in finding solutions, which would be impossible with traditional kinds of technology. Taking it for granted that the locals know their area better than anyone else and can therefore provide a detailed description of local phenomena (otherwise to be studied by means of traditional geographical systems) "the community itself must be seen as a kind of database, not conventional like IT, but very straightforward from a social sciences point of view".[12]

Technologically, GIS is an advanced and widely-used spatial analysis system. It is used in local administration (e.g. in the regulatory plans of municipal districts) and for analysis and planning in research institutes. The problem is that often decisions based on GIS data are made behind closed doors, with the use of information not available to the outside world, without the smallest contribution from citizens and those people not directly associated with administration or research.

For the geography experts of the University of Leeds the question is one of public understanding of science and the social mechanisms related to decision-making. It has emerged from their studies that those who have the power to decide, often have access to all relevant pieces of information, are experts in decision-making methods, and have a detailed know-how of all the aspects of the problem of a particular field. This is in contrast to the citizens who have only a limited perception of problems, limited access to data, and little or no experience whatsoever in handling negotiations and making decisions. However, although professionals can claim that they are better prepared for taking decisions, that doesn't mean that the citizens' opinion must be under-estimated or entirely ignored.

Below, is an example of a participation model used by stakeholders taking part in a decision-making process based on the sharing of GIS information (it was created by the American Cerro Grande Rehabilitation Project):[13]



According to the model (which envisages web-based access to community data and tools - to be dealt with later), the stakeholders' contribution is the good use of their collective intelligence, together with the identification of the most relevant issues and the model of their interactions. The model helps reach consensus, bringing forward points of agreement or dissension.

The first step of the model consists in every stakeholder analysing GIS data. Thereafter, a well-structured plan of the issues deemed relevant is drawn up and opinions are exchanged. The third phase comprises analysis and the identification of areas of friction and harmony, to be represented on graphs. All the data is then fed back into the database and made available to the stakeholders. In the fifth and final phase, new requirements are met by acquiring new data or developing new software programmes that help the stakeholders make informed choices.

The powers of GIS

To better understand the possibilities offered by GIS, its limits and difficulties, it is necessary to keep in mind the particular characteristics of the system (as opposed to other geographical information systems) and what happens when data is distributed via Internet with an interfacing web system.

A GIS is, basically, a computerized system that assembles, stores, manipulates, analyses and displays geographically-referenced information. According to a classification put forward by Nicola Maiellaro, based on the work of K. Gardens, geographic information systems can be divided into three varieties:[14]

- the simplest, most intuitive uses a series of ready images. Based on an alphanumeric selection, the user receives an image that corresponds with a pre-selected section of a map;
- the intermediate includes maps with "vulnerable" areas. These are images with hyper-textual cross-references according to the coordinates the user points to at the moment of selection;
- the most complex is interactive, typical of a GIS application system where the user is supplied with a re-elaborated map based on the functions activated (e.g. zooming in on a map does not only mean re-establishing the dimensions of the image, but also identifying the objects filed in the archive and related to the area being examined).

Other than the geographical positioning of objects, a GIS database also contains the information needed to distinguish one object from another and highlight the relationship between them. Therefore, as opposed to a complex map, a GIS application allows for spatial, and not only graphic, selection. In a GIS, selection occurs from a set of geographical features having spatial relationships - contiguity, adjacency, intersection etc. – and which possess certain attributes.

A complex GIS associates a topological description (not only a geometric one) of the mapped objects with a system of relational management, allowing for logical and topological relationships. Furthermore, cartography, other than in raster format data (a series of adjacent cells that correspond with the pixels on the screen), can be represented in vector format data (it visually represents complex shapes or linear features through the combination of points and lines – as on a Cartesian plane). This allows for the re-calculation of data in real time, with the precise drawing of a map of any scale.

In this way, a GIS integrates and connects information that is usually difficult to link with other methods, and also builds and analyses new variables, and encourages simulations: in its most impressive form and application, a GIS "produces meaning".

The Web as a Facilitator

According to Carver, the contribution of a GIS to the democratic participation of the stakeholders, to the management of territorial problems and to sustainable development, is essentially based on the possibility offered by Internet (with appropriate web interfacing) to use the database, to interact and exchange opinions on-line. Carver recalls that via the Internet, participation is not restricted to geographical positions, time, or particular occasions – it is always possible to hear the ideas and information of other stakeholders who are a part of the virtual community. Furthermore, it is possible to express personal ideas anonymously, thereby avoiding antagonism.

Carver's observation concurs with that of the Canadian experts Michael Sutherland and Susan Nichols.[15] They believe that "Web-GIS Technologies allow stakeholders to share and integrate spatial information without them having to find their own methods for acquiring data, and this further facilitates cooperative management. In a particular coastal area, for example, various people may cooperate with the governing bodies of that area, sharing, in real time, the spatial data kept in the system".

The statement, which underscores the great importance of Geographical Information Systems, especially those available through Internet, may, however, be disparaged. Firstly, the superfluous role it attributes to technology, as if one form of technology can, alone, and as opposed to other forms, solve the problem of democratic participation in decision-making processes regarding sustainable development. On the contrary, a GIS is to be perceived as an effective tool for the integration and convergence of various problems.

Secondly, there is the unsolved problem of the digital divide, the divide between those who have and those who don't have access to computers and the Internet, thus creating a paradoxical form of exclusion: those who can democratically influence the decision-making process because they have access to technology would be separated from those who find themselves in a situation of technological deprivation.

Thirdly, Web-GIS Technologies are anything but easy to use; much work needs to be done in making interfacing "friendlier" for the user.

Translated by Veronica Cioni, Scuola Superiore di Lingue Moderne per Interpreti e Traduttori, Trieste, Italy.

Notes and References

[1] Translator's Note: The Park is situated in Emilia Romagna, one of the North Eastern regions of Italy located just above Tuscany.
[2] Translator's Note: Ferrara and Ravenna are two of the most prominent cities of Emilia Romagna.
[3] M. Fabbri, "Temi e progetti dei parchi", *Annuario del grande delta,* CDS Edizioni, Ferrara, 2004.
[4] Rare resources recognized nationally and internationally thanks to the creation of Natural Reserves, the Ramsar Zones (Thanks to the Ramsar Convention (1971), the wetlands of more than 65 countries are preserved and protected) and the singling out of Protected Areas (In Italian: *ZPS*) and Sites important for the Community (In Italian: *SIC*) by virtue of the directives for the implementation of nature conservation policies at community level.
[5] G. Gabbianelli, L. Previati, F. Zanni, *Master Plan della costa del Parco regionale del delta del Po, progetto esecutivo,* p. 8, 2002.
[6] The European Commission, *A Communication from the Commission to the Council and the European Parliament on 'Integrated Coastal Zone Management: A Strategy for Europe'*, Brussels, 2000.

[7] M. Fabbri, "L'onda del mare nostrum si allunga", *Scienza esperienza*, 4, October 2003, p. 10.
[8] G. Gabbianelli, L. Previati, F. Zanni, *Master Plan della costa del Parco regionale del delta del Po, progetto esecutivo*, cit., p. 9.
[9] *Ibidem*, p.8.
[10] S. Carver, *Participation and GIS*, A Position Paper for the ESF-NSF Workshop on Access to Geographic Information and Participatory Approaches using Geographic Information, Spoleto, pg. 1, 2001.
[11] *"GIS and Society"* is an American project involving two initiatives of the National Centre for Geographic Information and Analysis (NCGIA): *Collaborative Spatial Decision-making* and *The Social Implications of how People, Space and Environment are Represented in GIS*. In the United Kingdom, the leader in such studies is the School of Geography of the University of Leeds.
[12] S. Carver, *Participation and GIS*, cit., p. 10.
[13] <http.//consensus.lanl.gov/cerro>
[14] N. Maiellaro, "Il piano regolatore generale", *MondoGIS*, 27, 2003.
[15] M. Sutherland and S. Nichols, "Web-GIS Technologies and their Potential as Decision Support Tools for Sustainable Development", *FIG XXII International Congress*, Washington D.C., p. 8, 2002.

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