

What is MULINO?

MULINO, an acronym for MULTI-sectoral, INTEGRated and Operational decision support system, is a 3-year project recently financed by the European Commission that focuses on the sustainable use of water resources at the catchment scale. The purpose of the project is to provide an operational Decision Support System (DSS) to assist water authorities in the management of water resources, aiming at improving the quality of decision making and seeking to achieve a truly integrated approach to river basin management.

The MULINO-DSS tool will cope with real problems and issues arising from variegated and conflicting water demands at the local level through the direct involvement of local end users and stakeholders, and will be able to simulate alternative scenarios based on changes in external driving forces (policy changes in particular). To do this, the DSS tool will deal with spatial variations of the most important social, economic and environmental parameters. Finally, MULINO will enable an efficient transfer of knowledge and skills to water managers and other end users.

The development of the MULINO-DSS requires the integration of socio-economic and environmental modelling techniques with a geographic information system (GIS) to describe a series of catchment areas used as case studies. In each study a specific water management decision acts as the context for the development of alternative scenarios.

The case studies will involve local networks and DSS end users in the development of the system, with prototypes presented in each local language. The policy background, which prioritises sustainable water use, is described by the EU Water Framework Directive.

The application context for the MULINO DSS is twofold. Firstly, the tool can be used to support water management in concrete decisional cases, and secondly, it can be used to assess water resources in representative European catchment areas.

Activities

The first plenary meeting of the EU project MULINO was held in Milano at the Fondazione Eni Enrico Mattei on the 22 & 23 March 2001.

The following achievements mark the first ten months of research and dissemination activities:

- Methodological Report
- MULINO web site and brochure
- Booklet containing instructions for setting up the local networks
- First Management Report

At the XIX^e European Congress for Rural Sociology, held in Dijon last September, MULINO was presented as: *Project MULINO: Involving competent authorities and stakeholders in the design of a Decision Support System for sustainable water use in Europe.* Giupponi, C.; Lourenço, N.; Cogan, V.; Machado, C. (2001)

Building local networks for the development and implementation of MULINO DSS*

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Water constitutes a vital resource for human development. As the population increases, there is an increase in need for this natural resource on the planet's surface. This growing need, however, contrasts with a limited supply, frequently generating situations of conflict in the demand for water in quantity and quality. It is therefore necessary to look for decision-making tools that allow for an integrated approach in the planning and management of the various types of use of this resource in a given region.

The management of natural resources considered from the perspective of Sustainable Development requires an integrated approach to social, economic and environmental factors. Many decision-making systems tend to separate these factors in order to define planning and management policies.

In using catchments as units of territorial management a systemic analysis is useful for developing a vision of the area as a system made up of various biophysical and social subsystems, all integrated in larger systems with which various types of interactions are established. By systemic analysis it is meant an integrated approach that includes natural resources (in this case water resources) as a part of functional systems, in which the interactions of biophysical and socio-economic components must be adequately considered, taking into account the long-term management (use, conservation and protection) of these natural resources.

In order to understand the way a catchment works, it is important to understand how it is used and administered by the people in it, in a permanent or temporary way. The relationships and interactions between the various social actors (whether individual or collective) are structured in the form of networks. In reality "...the people belong not only to groups but to networks as well, the groups being the reflection of the structural relationships that tie the individuals together..." (Degenne A.; Forsé, H.B., 1994).

Thus, in a relatively static way, networks can be defined as: "...systems of social actors that propagate among themselves information and resources across structures with strong connectivity with the objective of making common a variety of their internal environment. Aside from this, it is observed that the interactions with the external environment of the network arise from structures with a lesser degree of connectivity (Lemieux, V., 1999).

In the decision-making process networks function as an essential tool in the transmission of normative systems, which regulate the decision; in the transmission of information, thus allowing for the identification of the existing problems and potentials; in the evaluation of a proposal's validity; and also, in the understanding of interactions and conflicts among various social actors, whether individual or collective. At the local level, it is

* This article is a brief synthesis of the work developed in MULINO's Local Network Booklet.

imperative to consider the relationships among the various social actors as local potentials and liabilities, and as such highly relevant to the success of the decision-making process.

It is necessary to identify the pre-existing local networks (the various actors and their interactions) in a particular area in order to be able to construct a local network, which can be used to inform the development of the decision support system being innovated by the MULINO project for the sustainable management of water resources. Furthermore, given that the transmission of information is a phenomenon essential to the functioning of social networks, this network can assist in the dissemination of this new tool to support decision-making.

In this way, the local network must be seen as an instrument that will support both the building and the functioning of the MULINO DSS, since these networks are dynamic and evolve with the changes that occur over the course of time. The local networks established for the project will be important also in terms of the continuous supply of information that they can offer to the MULINO DSS.

The following diagram shows how the networks that are established at the local level are integrated into larger networks (regional, national, and even international). Moreover, the diagram shows how the networks that are established within the context of the decision-making process are relatively centralized.

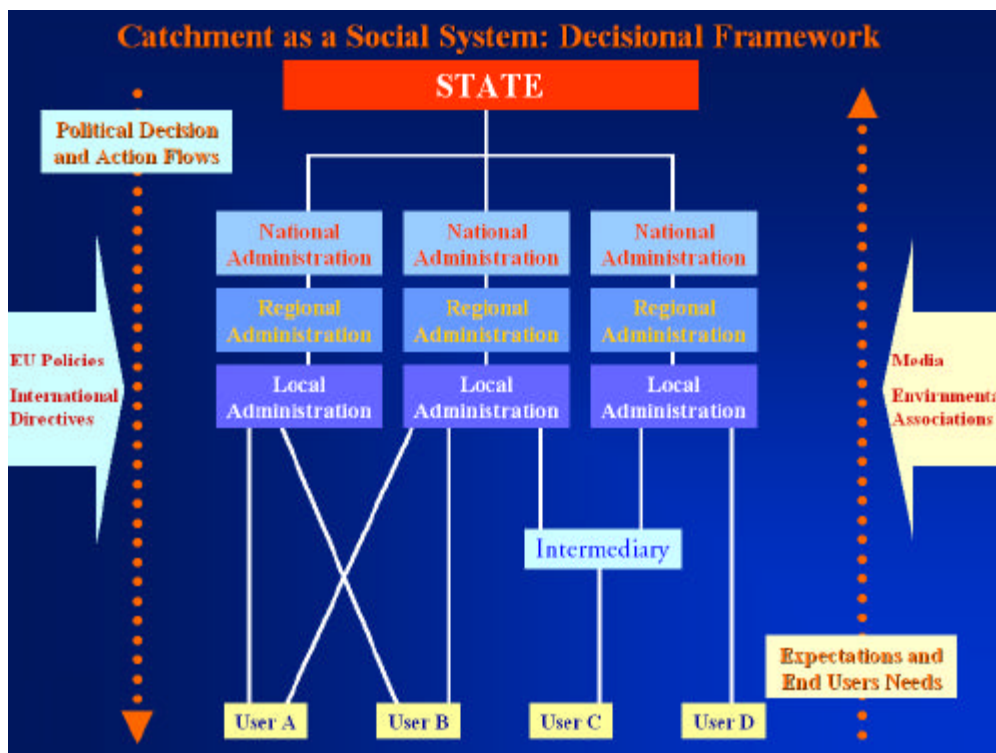


Figure 1 – The structure of a social network present in a catchment area

The transfer of resources and information fundamentally follows a chain, somewhat hierarchical, which encourages top-down communication and making the reverse more difficult. It is to be noted that horizontal communication among the various levels of the diagram is of lesser importance, although not inexistent. These types of information flows indicate that we are not in the presence of a *perfect network* in which all the actors are at the same time transmitters and receptors of equal importance.

The diagram in figure 1. implies that in the internal environment of the network there are preferential transmission (and imposition) flows of the normative framework, and not all of the actors are of equal position. This structure does not mean that all of the decisions, information, or actions transmitted from the higher levels will necessarily be accepted. In fact, there can be differing perceptions of the potential and problems in a given region as a result of various operational rationales (local, regional, national and supranational) at varying proximity to

individual actors. These perceptions may be configured in various perspectives of development.

An awareness of these conflicts is essential to be able to understand the rationale of these networks and to understand where the obstacles to decision-making and to the implementation of policy measures lie. For this reason it is important to be aware not only of the individual and collective social actors, by characterising them and understanding their functions and levels of intervention, but also to be aware of the various types of relationships that exist among these actors and that characterise the network.

REFERENCES:

Degenne A. Forsé, H.B., 1994. *Les réseaux sociaux*. Ed. Armand Colin, Paris, 288p.
 Lemieux, V., 1999. *Les réseaux d'acteurs sociaux*. PUF, Paris, 146p.