



## **An integrated consensus support system for conflict analysis**

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In water resources management domain, increasing interest is posed in enhancing public participation. The importance of shared decision process in water management, derives from the awareness of the inadequacy of the traditional - engineering - approaches in dealing with complex and ill-structured problems. It's becoming increasingly obvious that the "hard" problem solving and decision support techniques, based on optimization and factual knowledge, have to be combined with "soft" stakeholders based policy design and implementation. Therefore, these two approaches are not mutually exclusive but complementary in a new and integrated view of the management schemes. The aim of our research work is the definition of an Integrated Consensus Support System (ICSS) able to support the participative decision-making process in all phases, involving the problem definition and structuring, the identification of the possible alternatives, the formulation of the participants' judgments, the consensus achievement. Furthermore, the ICSS aims at structuring, systematizing the knowledge emerged during the participative process in order to making it comprehensible for the decision-makers and functional for the decision process. Therefore, different methodologies, able to deal with different aspect of the decision process, have been considered and integrated in the System. More in detail, the Problem Structuring Methods (PSM) and the Multigroup Evaluation Methods (MEM) are applied. The PSM is used to support the stakeholders in providing their perspective of the problem and to elicit their interests and preferences. The MEM is used to define the consensus degree about each alternative, highlighting those where the agreement is high, the consensus label for each alternative and behaviour of the individuals during the participative decision-making (e.g. who are less in agreement and in which preferences this occurs). The ICSS is applied to a decision process regarding the use of the treated wastewater for the agricultural irrigation. This decision problem is particularly interesting for the scopes

of this work because of the high level of conflicts. The strong opposition of the local community and of the farmers has hampered the implementation of this policy, causing also economic damages to the local water agency. Thus, the ICSS has been used to discover the reasons of the conflicts, eliciting the perspectives and the preferences of the other stakeholders, and to propose to the local decision maker some mitigating strategies to reduce the level of conflict.