Integrated Evaluation for Sustainable River Basin Governance

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Social Multi-Criteria Analysis for the Evaluation of Water Management Alternatives. The Case of The Costa Del Sol (Malaga, Spain)

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10.1. INTEGRATED EVALUATION, MULTI-CRITERIA EVALUATION AND THE WATER FRAMEWORK DIRECTIVE

Although the Water Framework Directive (WFD) does not explicitly call for integrated evaluation to implement the several processes that shall govern the water environment of the European Union, it is recognised and also fairly sensible that integrated sorts of evaluations have to be performed, to deal with:

1. the Directive’s own wordings of “sustainable activities”, “significant effects”, “significantly better environmental options”, “environmental and socio-economical needs” which call for multi-dimensional analysis;
2. the complexity and uncertainty associated with available knowledge to govern, plan or foresight the water resources of the EU;
3. the gaps of scientific and technical knowledge about the water resources and the need to extend the knowledge basis to knowledge other than scientific or technical;
4. the request of involving relevant social actors in the governance processes (Article 14, etc.), acknowledging a key feature of water governance: plurality of interests, of perspectives, of values and of relationships with water.

The “economics and the environment” guidance document for the implementation of the Directive proposes evaluation tools mostly of economic and cost-effectiveness nature; the document already points out that other expertise and dimensions should be included in assessment processes of water resources. However, it should be understood that the inclusion of other expertise, other knowledge and other dimensions of analysis has to be processed with tools that:

- do not amalgamate those multiple dimensions into a single scale of measurement because they pertain to different actors of decision processes that talk different languages,
- acknowledge the inherent complexity of different types of knowledge,

may account for associated uncertainty and
since the framework seems to acknowledge extended participation of relevant social actors, evaluation tools should also be able to host shared framing, scoping and assessment of participatory contexts.

Integrated evaluation calls for these types of tools and they are the only way off to responding to the inclusionary spirit of the WFD in some of its parts.

Multi-criteria techniques have been adopted as the means to address environmental management issues. Not only did they potentially allow for conflict analysis and evaluation from multiple perspectives but also embedded an important conceptual stand as far as decision processes are concerned. Roy (1985) pointed out that “the principal aim of multiple-criteria decision aid is not to discover a solution, but to construct or create a set of relations amongst actions that better inform the actors taking part in a decision process”.

In the last decade multi-criteria evaluations have evolved, from technocratic to participatory approaches, acknowledging the context in which decisions were taking place (Guimarães Pereira & Corral Quintana, 2002). Indeed, not only the algorithmic features have evolved to allow different types of scales to be processed simultaneously, but also the place of multi-criteria evaluation methods has changed. They are used as structuring tools, to support deliberation and decision making processes, assisting on: framing, scoping, generation of alternatives and eventually evaluation and comparison of alternatives. When applying participatory approaches in a cyclical and deliberative way, the decision process becomes a mutual learning exercise both for the participating stakeholders and the analysts’ team. It upholds the principle that stakeholder participation enriches the evaluation thanks to the multiplicity of perspectives, skills and expertise that it combines.

Nevertheless, participation is a necessary but not a sufficient condition to soundly support and legitimise the decision-making. Taking into account that ethical judgements are intrinsic components of the assessment exercise, conditioning the overall outcome, transparency concerning assumptions present throughout the whole process is essential as a guarantee for the study’s quality preservation. Participatory techniques are, thus, useful tools for the understanding of the problems but have to be completed by the analyst’s responsibility towards society. Tolerance and plurality of ethical principles are also essential (Munda, 2002).

10.2. INSTITUTIONAL ANALYSIS, SOCIAL RESEARCH AND THE NAIADE MODEL

10.2.1. Theoretical Background

Understanding the decision making process implies that the social context is properly understood before any decisions are made. The perceptions and positions of the actors who are involved need to be analysed, as well as the relationships that arise among them within the cultural, legal, administrative and political framework of the given case study (Corral Quintana, S. 2000).

The analysis of this complex context, i.e. institutional analysis, is performed in a series of steps. The first one is a thorough study of the proposed problem, which results in its definition and characterisation. The second step includes an analysis of the alternatives and relevant criteria, as well as the relationships among them.

A study of the actors that are involved in the process is a basic issue, closely interlinked with the problem identification. The first step in this regard is to identify who are the main actors, with the aim of making subsequent observations in three aspects: their interests and positions, their capacity to act, and the potential alliances that can take place. The analysis of the social dimensions of decision making processes should allow a better understanding of the effects that can be derived from the adoption of different alternatives, or why one alternative has so far prevailed against all others, perhaps without any apparent reason.

Each actor defines the problem based on his own knowledge, resources and objectives. The fact that actors can have different perceptions allows different problem definitions to occur, sometimes even including opposing views. Stakeholder participation enriches the evaluation thanks to the multiplicity of perspectives, skills and expertise that it combines.

Dente et al. (1998) suggest that the problems inherent in decisions contain three fundamental characteristics: its non-objective nature, its instability and its consequences, which will depend on the role of the analyst in the general conduction of the study. On this basis, the analyst team must be the one who “has to define according to his point of view what the central question is in the decision making process” (Dente et al. 1998) and must consider the different

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18 A distinction needs to be made between objectives and related concepts such as ideals and wishes. The difference is that an objective goes farther: “the actor has decided to try to make his wish a reality” (Dente et al., 1998).
problem definitions as expressed by the main actors by using his own experience when dealing with these issues (Ingram et al. 1984).

10.2.2. Description of the methodology applied

The first phase of the analysis concerns the definition of the context and the identification of actors. Institutional analysis and social research encompassed examination of normative context, multi-scale analysis of media, study of economic political processes and participatory observation.

The method applied in the case study below presented integrates techniques from multi-criteria analysis, which has its origins in the social sciences and whose use has been recognized as a powerful tool in sociological research (Denzin, 1978). The opportunity of the method is more obvious when it is applied in cases dealing with environmental problems. The combination of social techniques with multicriteria ones improves the understanding of the results of the analysis and clarifies the positions of the actors involved in the process (Corral and Funtowicz, 1998). It is important that different participatory and interaction tools are used at different stages of the study, allowing for continuous testing of assumptions and biases of the research team (Munda, 2002).

There are three sources that are commonly used when defining the problem and identifying the actors and that have to be adapted to the specific conditions of each concrete case study. The first source comes from the multi-scale media analysis. This source of information is quite relevant as far as it provides a broad vision of the process and the different visions, perceptions and arguments of the actors involved in the process. The comparative analysis will reflect political preferences or bias, social interpretation as well as the relative importance of the event at different spatial scales, such as those represented by the local, regional or national levels.

Formal and informal documents related to the case are the second source of information. Thus, an analysis of the current legislation and its trend for a specific period of time allows the institutional framework, that conditions the issue’s scope, to be known. A historical review brings the analyst closer to a chronology of the problem under study. This analysis also provides information regarding the behaviour of the agents in aspects such as alliances, changes in objectives, inclusion or disappearance of actors or changes in the geometry of power. Investigations regarding pamphlets, reports and proceedings of meetings undertaken by the actors also must be added to this documentation.

The third source of information, and arguably the most important one, is in-depth interviews, which purpose is to collect direct information and opinions from the actors involved in the process in an unstructured format. These interviews are open, that is, the analyst does not addresses specific concerns of the problem. Generally, a subsequent round of contact with actors are carried out to specifically address: (i) some aspects of the case; (ii) relationships with the rest of the actors: similarities or disagreements in objectives; and (iii) available resources which influence the process. The objective of these contacts are to collect information about the objectives and strategies of the actors, possibly discovering hidden agendas and allowing possible alliances among other actors to be investigated.

The second phase of the analysis includes the exploration of the alternatives of the case study and the definition of a set of criteria which allows these alternatives to be analysed and compared. The alternatives must be represented in the most general manner possible, including a wide range of actions and solutions present in the case under study. The criteria that are chosen for the analysis of the alternatives must be coherent with the case study, including diverse aspects, such as economic, social, ethical and environmental ones, among others.

At this point the information obtained by means of the different social techniques and criteria applied to the alternatives are incorporated into the multi-criteria model. An interesting result of the combination of social techniques with multi-criteria ones is that the multi-criteria analysis looses some of its technocratic character since the analyst draws upon alternatives and criteria obtained by applying a transparent, cyclic and deliberative social research. The multi-criteria analysis allows different alternatives to be explored as a function of the different chosen criteria. The result of this examination will determine a structure of alternatives to be presented to the actors involved for collective and open discussion. This stage is especially recommended, following the focus group methodology, with a view to obtaining feedback, sharing and clarifying the information collected and discussing the results achieved.

In concrete case study that is presented below, the selected multi-criteria analysis model was NIADE (Novel Approach to Imprecise Assessment and Decision Environments), designed by Munda (1995), its software implementation being done at the JRC, Ispra site (JRC, 1996). The NIADE model specifically offers a series of features which make it adequate for the study of socio-environmental problems through its combination with socio-institutional analysis, as well as avoid some of the criticisms that multi-criteria methods have received:

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19 The combination of participatory and institutional approaches with multi-criteria evaluation was proposed and tested in the VALUE project, specifically in the case study on the evaluation of water management alternatives in the region of Tronza in Sicily, which did not seek to provide solutions to existing conflicts, but to progress towards compromise solutions capable of achieving a high degree of consensus among the different stakeholder groups (De Marchi et al., 2000).
• It allows the use of information affected by different types and degrees of uncertainty, such as qualitative, quantitative, precise and fuzzy information, which is of great importance when processing information that is not wholly accurate, reliable, exhaustive and unequivocal.

• NAIADE differs from other multi-criteria methods in that there is no differential weighting of the different criteria used to evaluate the alternatives. The criteria are therefore not prioritised according to whether they are economic, environmental, social or institutional in nature.

• The purpose of the NAIADE model is not to produce an undisputable or “optimum” ranking of alternatives, but to rationalize the problem and provide a framework for communication among the social actors involved.

• NAIADE model allows for two types of mutually enriching evaluations. The first is multi-criteria analysis based on the score values assigned to the criteria of each alternative and performed using a matrix (known as the impact matrix). The second is an equity evaluation, which analyses the value judgements of the stakeholders involved in the evaluation process for each alternative using another matrix (known as the equity matrix) and the possible formation of coalitions (by representing a dendrogram with groups of stakeholders who defend one of the proposed alternatives).

The environment included in the social analysis allows an improved information structure and visualization of the problem to be appreciated, as well as in the presentation of the objectives and perceptions of the actors involved. This possibility of structuring information offers two main advantages: (i) the analyst can classify and work with the information in an easier way, taking into account that the definition of the context is not easy and consequently hinders the study of the decision making process and (ii) community members such as political decision makers, involved actors in the problem, or the population at large, i.e. the general public, will be allowed to access and understand more easily the situation under study and the positions of those involved, which is important to assist in the negotiating processes aiming at conflicts' resolution (Guimarães Pereira, Â., et.al., 2004).

10.3. EVALUATION OF ALTERNATIVE OPTIONS FOR WATER SUPPLY OF THE COSTA DEL SOL (SPAIN)

10.3.1. The Costa del Sol: Water Issues

10.3.1.1. A largely tourism-based economy

The Costa del Sol is an area that has experienced rapid growth in tourism in recent decades, which has led to a transformation of its socio-demographic and economic structures, mounting pressure on resources and land use restructuring. The resident population has seen several decades of continuous growth, which has quickened even further in recent years: between 1996 and 2001 the resident population (341,401 inhabitants in 2001) grew by 19%, compared with a 2.8% increase in the region of Andalusia as a whole. This sharply rising population trend, coupled with high tourist traffic, which triples the resident population in the summer months and doubles it during the rest of the year, has resulted in increasing saturation, congestion and land overdevelopment. The population density of the Costa del Sol, including both the eastern and western parts, which account for 76% of the province’s population, is almost double the provincial average.

From an administrative point of view, the area under study comprises the eleven municipalities of the joint corporation Mancomunidad de Municipios de la Costa del Sol Occidental (see figure 10.1). These municipalities roughly coincide with the hydrographic district known as Subsystem 3 (western Costa del Sol) of Exploitation System I (Serranía de Ronda), defined in the Hydrological Plan of the Confederación Hidrográfica del Sur de España water authority.
Figure 10.1 Location and boundaries of the area under study

Urban development in the area has been characterised by extraordinarily intense growth in the absence of an adequate regulatory framework. Investment in real estate and the development of the construction sector have been key factors in the case of the Costa del Sol, benefiting from a seemingly bottomless tourism market in Central and Northern European countries. According to data supplied by the Costa del Sol Tourism Observatory (including the western part of the Costa Sol, the area examined in this case study, and the area to the east of the city of Malaga), 8.6 million tourists visited the area in 2003. The average stay was 4.57 days and total spending by tourists amounted to 4.140 million euro.

There exists a development gap between the coastal strip and inland areas which leads to two opposing perspectives on the development trends operating in the area, i.e., one points to the growth dynamics of Malaga's tourism market as a key factor in the overall development of the province and the region, considering territorial polarisation processes as an inevitable consequence. The other point of view stresses the unacceptability of the intense processes of densification and congestion on the coast, accompanied by depopulation, population ageing and the extraction of resources, particularly water, from the inland areas.

10.3.1.2. Hydrological characteristics and water management
Water management strategy in recent decades has been unerringly based on the first of these perspectives. Nevertheless, in recent years, a new logic has emerged in relation to this issue defending the necessity of territorial cohesion.

From a hydrological point of view, the Costa del Sol is an area that is particularly relevant as a case study for the ADVISOR project purposes. On the one hand, it has suffered spells of drought that have highlighted competition and conflict between different water uses, and on the other, the area is characterised by the uncontrolled increase in certain water uses and the lack of anticipatory planning by the competent authorities, whose response has been to instigate reactive emergency measures during drought spells, such as the last one from 1992 to 1995 (Paneque, 2003).

Rainfall in the area under study is relatively high, but varies considerably from one season to another (long and severe summer droughts) and from one year to another (ranging between over 1,200 mm in very wet years and under 300 mm in dry years), owing to the Mediterranean influence (see figure 2). The resulting river regime, also influenced by other physiographic factors (mainly topography, lithology and vegetation), can be described as subtropical Mediterranean, characterised by high water levels in winter and a lengthy period of low water levels. In some cases, the severity of the low flow periods is softened by the abundance of aquifer materials. On the contrary, the fact that the
basins of these rivers are relatively small and their courses short and steep, because the mountains where they originate are close to the sea, increases their irregular and torrential regime.

![Image of rainfall evolution in two meteorological stations of the Costa del Sol, 1965-2000](image)

**Figure 10.2 Rainfall evolution in two meteorological stations of the Costa del Sol, 1965-2000**

Source: Instituto Nacional de Meteorología. Paneque, 2003

These characteristics are a structural conditioning factor in water management in so far as hydrological variability must be adapted to the pattern of social demand. Intervention in the hydrological cycle to control variability and the strong demand for water, inflated by the expansion of highly consumptive, seasonal tourism, are two factors that influence water quantity, quality and environment, defining the backdrop to this issue.

Groundwater plays a significant role. There are numerous hydrogeological units affected by local or seasonal overexploitation, generally coinciding with coastal detritical units, where agricultural and urban demand is concentrated (Fuengirola, Marbella-Estepona). Another serious problem is the deterioration of groundwater quality caused by saltwater intrusion, as a result of excessive pumping of the aquifers. Additionally, there are some hydrogeological units affected by problems of nitrate and pesticide pollution, while half are polluted with heavy metals and three with organic compounds.

The uncontrolled rise in demand and the lack of forward planning have aggravated the impact of drought on the area. The problem is further exacerbated by the conflict between central government authorities and the regional authorities over water management powers and, above all, by the failure of the water authority - Confederación Hidrográfica del Sur de España, the River Basin Authority for Southern Spain, under the Ministry of the Environment - to establish adequate channels for public participation\(^3\) (Paneque, 2003).

The organisational structure of water management in Costa del Sol Occidental is particularly complex, further exacerbating existing conflicts. According to Spanish hydrological boundaries, this coastal area belongs to the Southern Spain river basin, which is managed by the above-mentioned Confederación Hidrográfica del Sur de España. This authority does not cover a single natural river basin but a number of small basins that empty into the Mediterranean Sea between Gibraltar to the west and the border with the region of Murcia to the east. The Confederación Hidrográfica del Sur de España is therefore an administrative hydrographic unit situated on the Mediterranean side of Andalusia region, covering the provinces of Cadiz, Malaga, Granada and Almeria and grouping together a series of sub-basins that are independent of each other from a hydrological point of view.

Closely linked with lack of public participation, another aspect of the debate on the problem of the Costa del Sol water supply and the alternative solutions is the growing complexity and opacity of the management structure. Direct responsibility for the management of urban water supply in the area is shared by the company Acosol, which belongs to the Costa del Sol Occidental Joint Municipal Corporation, and by the Town Councils. The first is responsible for

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\(^3\) In the final stage of drafting this report, the outcome of the elections held on 14 March 2004 changed this situation. The fact that the Socialist Party is now the governing party both in the central and regional government opens up new prospects for a solution to the conflicts that have dragged on for 20 years. In fact, on 1\(^{st}\) January 2005 the competences concerning the Southern Spain river basin were transferred to the Andalusian regional government.
managing the raw or bulk water supply and sewerage services in the eleven municipalities that it covers, while the Town Councils are responsible for local distribution and direct billing of end users. The Town Councils or local authorities can either manage these services directly through a municipally-owned company or charter commercial companies to do so, which makes increasingly difficult to obtain information on basic aspects of water management.

These local enterprises - in addition to distributing water supplied by Acosol from the La Conepción reservoir on the River Verde in Marbella, the main surface-water source in the area, also manage their own groundwater resources which, although affected by a process of progressive deterioration and depletion, can be managed by them more directly and independently and at a lower cost.

Water consumption by users, system efficiency levels and water prices, on which it is also generally difficult to obtain accurate figures, differ greatly from one company to another.

In general, the costs are not wholly passed on to the user, although prices vary considerably from one water supply Company to another. The effect on billings of the increasing block tariff structure, which penalises higher consumption, is in some cases very slight and, in all cases, softened by the impact of the monthly fixed service charge that all users must pay regardless of how much water they consume.

A significant feature of the water supply system in the area, with important implications for water management is, as mentioned above, the difference in the price of raw water supplied by Acosol and that of groundwater. The first is more expensive (around 0.15 €/m³) than the groundwater that local water companies can obtain from the aquifers in their respective localities (averaging 0.05 €/m³). This difference in price has led to the overexploitation and sometimes irreversible deterioration of aquifers in the area.

This problem is even more serious when it comes to treated waste water, also managed by Acosol, which is responsible for sewerage services. In this case, the price rises to around 0.25 €/m³, and there are no regulations in force requiring the treated water to be used for compatible purposes. This explains why, in spite of the situation of alleged water shortages and scarcity, only around 10% of treated waste water is reused, while cheaper, higher-quality water is used to water large areas, such as golf courses and cropland. In the total area covered by the Confederación Hidrográfica del Sur, as in Spain as a whole, urban uses (domestic, municipal, industrial) account for only a small proportion - between 10% and 20% - of total water consumption, with agricultural uses (irrigation) usually accounting for 80% or more of total demand.

In the specific Costa del Sol area, however, agricultural consumption has been progressively overtaken in recent decades by urban and tourism uses to become a very secondary sector of demand. Nevertheless, as observed above, irrigation still accounts for a significant proportion of total consumption in the river basin area, in some cases subject to the problems of subsidised costs and hydraulic and economic inefficiency that often characterise agricultural uses of water. The reduction of water consumption by agricultural activities and reallocation to urban uses therefore continues to be an issue in the debate on alternative solutions to water supply system problems.

Finally, this overview of the characteristics of the water system in the area under study must include a reference to the seawater desalination plant commissioned by the Town Council of the area's main town (Marbella) just as the lengthy period of drought that lasted from 1992 to 1995 came to an end. Since its completion in 1995, it has not been put into operation, because there has been no recurrence of such a drought situation. In spite of the fact that the plant is not in operation, amortisation and maintenance costs still have to be met.

10.3.2. Methodology application: actors, problems, alternatives and evaluation criteria

The application of the social multicriteria methodological framework to this case study had the general objective of finding out whether it is useful in implementing the integrated evaluation and participation objectives established in the WFD. The specific goals were to test the practical feasibility of this technique, in addition to its ability to:

- Facilitate understanding and structuring of problems characterised by multidimensional evaluations.
- Contribute to clarifying the nature of conflicts and creating the conditions necessary to find a meeting point between opposing positions.
- Promote active participation in all the phases of the decision-making process and enable actors to acquire knowledge of each other and their respective positions.
- Promote the formulation of innovative alternatives and make it possible to progress beyond approaches blinkered by routine and inertia.
In order to apply social multi-criteria analysis to the case of the Costa del Sol Occidental water supply, the following stages were implemented (see figure 10.3):

1. Definition of the problem to be appraised and determination of the scope of study, thorough institutional analysis and social research techniques;
2. Identification of the stakeholders and legitimate interests involved;
3. Identification of the alternatives and criteria;
4. Evaluation of alternatives through multi-criteria analysis;
5. Presentation of results to the stakeholders involved in the previous research phases, following the focus group methodology with a view to obtaining feedback, sharing and clarifying the information collected and discussing the results achieved up to that point.

10.3.2.1. Definition of the problem, determination of the scope of study and identification of the actors and interests involved

Institutional analysis and social research encompassed examination of normative context, analysis of national and local media, study of economic political processes and participant observation — researchers’ immersion in the Foro de Málaga and the Agenda 21 of the province of Málaga — which lead to the definition of the problem and identification of actors.

The time periods selected for the press’ analysis were the years 1994-1995 and 2001-2003. The first coincides with a period of drought in the area, when the water debate was particularly heated and there was a barrage of statements made by the actors involved. The second was a more recent period, specifically October 2001 to February 2003, when a further torrent of declarations was prompted by the threat of drought in the autumn of 2002. In addition to the systematic examination of these two periods, certain relevant pieces of information from the period in between were also included. A total of approximately 450 articles from the national daily newspaper El País and 800 articles from the local newspaper El Sur were studied.

In the stakeholder identification process (see figure 10.4), efforts were made to strike a balance between the number of actors from the public administration (5 participants), business organisations (5), non-governmental organisations (4) and experts (2) to avoid any bias in the weight of opinions and information gathered.
The objectives of the first phase of the work with the stakeholders were to define or diagnose the problem, identify alternatives and criteria and record suggestions made by the actors. These objectives were fulfilled by conducting in-depth interviews and written questionnaires.

The interviews were conducted according to a set script, which was, however, flexible enough to allow stakeholders to freely express their opinions on any subjects they considered relevant. The interviews were expected to take around an hour, although this was determined by how available the stakeholders were, so that the time ranged between 30 and 100 minutes. All the interviews were recorded with the prior consent of the interviewee, allowing a detailed analysis of their content. The information provided by the sixteen stakeholders in the interviews was clarified and elaborated on in a written questionnaire filled out by them after the interview. Analysis of the interviews revealed that there were gaps in the information required to carry out the multi-criteria evaluation and complete the impact and equity matrices in the NAIADE model. The written questionnaire was therefore formulated to refine some of the questions already dealt with in the interviews, but which needed to be elaborated on or clarified in some way.

In this way, the stakeholders were involved in the first stages of the evaluation to identify other stakeholders and assist in defining the problem. The problem framing was not intended to be an “expert” description of the current situation of water management in the Costa del Sol Occidental area, but a systematic exposition of the perceptions and knowledge of the stakeholders.

As a result of the interviews and questionnaires, two different perceptions of the water problem in the Costa del Sol Occidental area came to light. One was the definition of the problem from the viewpoint of the authority responsible for water resource management in the area, as reflected in the Cuenca Sur River Basin Hydrological Plan, based on the concept of a ‘structural water deficit’, affecting the whole of the river basin as well as subbasin units located in the area under study. This diagnosis serves as an argument for investment in new hydraulic infrastructures to improve the water supply in the area, in spite of the fact that at the same time the authority goes to great lengths to downplay the problem in the media, presenting a balanced, problem-free situation. The other stakeholders highlighted the fact that the Costa del Sol Occidental water supply situation is subject to tensions, conflicts and deficiencies, although the main reason for the problem is not absolute scarcity but inadequate management. They put forward the view that the underlying problem is not a ‘shortage of water’ but ‘resource mismanagement’. The majority of the stakeholders regarded the Costa del Sol Occidental as an area with sufficient water resources, but beleaguered by incompetent administration, and criticised the lack of forward planning and land-use management in a geographic area suffering the effects of
unbounded growth, a lack of coordination among the authorities responsible for water management and those responsible for territorial and economic planning and management as well as weak, ineffective water management information and participation mechanisms. This does not mean, however, that there are no differences of opinion among them with regard to the need to continue to implement measures to increase water resources by constructing hydraulic infrastructures. Some of them (water supply companies) agreed with the Confederación Hidrográfica that new hydraulic supply-oriented infrastructures are necessary, while others (regional water authorities, conservation groups) were of the opinion that this was not the best solution. However, they did all agree that measures to improve water management were of utmost importance and should be given top priority.

10.3.2.2. Identification of the alternatives and criteria proposed by the stakeholders
Stakeholder involvement was also ensured in the identification of water management alternatives and evaluation criteria (see table 10.1), as it was in the problem definition stage. The fact that the problem was perceived in different ways and the diversity of judgement values and interests at stake enhanced the process implemented to identify alternatives and evaluation criteria, as the criteria exactly matched the different positions taken by the stakeholders consulted. The proposed alternatives that were accepted by the majority of the actors included both actions aimed at increasing available resources and measures to improve demand management. Most of the stakeholders had more trouble identifying criteria to evaluate these alternatives, beyond the usual categorisation into economic, environmental and social criteria. This made us realise that we needed to provide a more studied criteria proposal as a starting point. A list was therefore drawn up and incorporated in the questionnaire, on the basis of which the stakeholders involved were able to add new criteria and accept or reject those proposed. Finally, the technical formulation, this is to say, the parameters that allow NAIAD to compare the different nature of criteria, i.e. preference relations and crossover points, was made by the research team.

Table 10.1 Alternatives and criteria identified in the Costa del Sol case study

<table>
<thead>
<tr>
<th>Alternatives</th>
<th>Criteria:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Heightening of the La Concepción dam</td>
<td>1. Implementation costs</td>
</tr>
<tr>
<td>2. Use of desalinated water</td>
<td>2. Operating costs</td>
</tr>
<tr>
<td>3. Reuse of waste water</td>
<td>3. Effect on employment</td>
</tr>
<tr>
<td>4. Modernisation of irrigation systems</td>
<td>4. Effect on economic activity</td>
</tr>
<tr>
<td>5. Rationised use of groundwater</td>
<td>5. Impact on the ecological status of water systems</td>
</tr>
<tr>
<td>6. Improved efficiency and water savings in the urban water supply</td>
<td>6. Impact on other ecosystems</td>
</tr>
<tr>
<td>7. Territorial policies to control urban development</td>
<td>7. Visual impact on the landscape</td>
</tr>
<tr>
<td>8. Non-intervention: maintenance of status quo</td>
<td>8. Degree of institutional difficulty</td>
</tr>
<tr>
<td></td>
<td>9. Degree of social acceptance</td>
</tr>
<tr>
<td></td>
<td>10. Equitable distribution of costs and benefits</td>
</tr>
<tr>
<td></td>
<td>11. Time required to fulfil the established objective</td>
</tr>
</tbody>
</table>

10.3.2.3. Alternatives evaluation through multi-criteria analysis
All the information gathered in the previous process were used to implement the following stages: construction of impact matrix, equity matrix and dendrogram of stakeholder coalitions using the NAIAD model.

On the basis of the alternatives and criteria identified, the impact matrix was constructed with value scores for each of the proposed water management alternatives, according to the eleven evaluation criteria (see figure 5). This matrix was based on data from specialized literature and technical reports, including quantitative, qualitative, crisp and fuzzy values. In order to evaluate the criteria relating to the public acceptance of each of the alternatives, an opinion poll was conducted among the inhabitants of the area. A total of 425 people were polled: 200 in the city of Málaga, 125 in the Costa del Sol Occidental area and 100 in the rest of the province.

The results allowed a comparison of the alternatives and the generation of a ranking according to the selected criteria. Serious problems were encountered when constructing this matrix owing to a lack of information expressed in quantitative and/or accurate terms. In fact, all the criteria, except the implementation costs for each of the alternatives, finally had to be expressed in qualitative terms.

In order to evaluate the proposed alternatives according to the respective positions of the stakeholders, generating a new ranking, the NAIAD model was again used to perform an analysis based on the equity matrix, reflecting the qualitative assessment of the alternatives made by the participating stakeholders in the written questionnaires.

Both rankings coincide significantly, underscoring the robustness of the analysis. In the two cases, the demand-management alternatives (saving water in the urban water supply, reuse of waste water) were the highest scoring. The modernisation of irrigation systems also occupied the same position in both rankings, although in the equity analysis, it
was not as far behind the top-scoring alternatives. In both rankings, the bottom two alternatives were the same, non-intervention and the heightening the La Conception dam, that is, the main alternative for the generation of more water resources.

The equity analysis also provided information about the potential formation of coalitions among the actors to defend or veto a given alternative. Based on the positions of the stakeholders, a dendrogram of coalitions was produced, representing the formation of possible ‘alliances’ among stakeholders in the form of a tree diagram, which indicated the degree of divergence. This provided an insight into which alternatives were more likely to be accepted, although the highest ranking alternatives were not necessarily the most feasible. The strongest possible coalition was observed between Ecologistas en Acción and the Genal Valley Working Group, two of the actors representing citizens’ organisations. A second coalition, albeit with a somewhat lesser degree of similarity, was formed by the University of Malaga and the Environment Section of the Provincial Council.

10.3.2.4. Final Research Stage: Focus Group

In the final stage of the case study, the research team organised a half-day meeting with the actors involved using the focus group methodology. The meeting was held five months after the interview and questionnaire stage had been completed, in a hotel located in the area under study.

The objectives of the final stage of the work were to:

- Introduce the stakeholders involved to each other and discuss the research process and methodology, informing them of the results recorded to date and sharing the information gathered during the previous stages.
- Corroborate and, if necessary, elaborate on and clarify the information obtained from the stakeholders and the conclusions drawn from their analysis: diagnosis of the problem and definition of alternatives and evaluation criteria.
- Provide the stakeholders with the opportunity to modify the information or the analyses made on the basis of the information supplied previously to include new aspects or to elaborate on those already addressed.
- Discuss the results achieved to date.
- Assess the validity of the methodology as an instrument to facilitate dialogue among the stakeholders involved, testing the feasibility of multi-criteria decision aid tools in participatory environments.

For various reasons, some of the stakeholders involved in the study did not take part in the focus group session. Specifically, nine of the sixteen stakeholders who participated in the previous stages of the work attended the meeting.

This is no mere coincidence, but the reflection of a characteristic of the institutional environment in which the experience was carried out: the difficulty of bringing together a broad group of stakeholders with decision-making powers and responsibilities in water management in the area, owing to political and social conflict surrounding this issue. In the Costa del Sol area, the friction materialised during the period in which the study was in progress (2001-2003) as confrontation and lack of dialogue particularly between decision makers from the River Basin Authority and other important social agents. In addition to this conflictive environment specific to the water management system, a more general institutional feature also influenced the experience: the lack of a well-developed organisational culture in the region that would put such information activities and interaction with other agents on the agenda of decision makers from the institutions and entities involved.

The focus group session began with a presentation of the overall objectives of the ADVISOR project and the results of the previous two project work packages. Afterwards, the methodology used involved a brief presentation of the preliminary results of the methodology carried out, divided into sections, given by one of the members of the research team, followed by an open discussion session (confirmation, discrepancies, observations) moderated by the project coordinator. The other two members of the research team acted as observers and secretaries of the meeting. At the end of each discussion session, the moderator summed up the main contributions and points of agreement. The entire proceedings were recorded on audiotape.

After the preliminary presentation, all the stages of the research process, namely identification of participating stakeholders, definition of the problem, selection of alternatives, identification of criteria, evaluation of alternatives and preliminary results, were presented, and the subject was opened to the floor for debate. A lively debate started up immediately and continued throughout the meeting.

Discussion on identification and selection of stakeholders

In the plan drafted by the research team over the two days of preparatory meetings, the identification and selection of stakeholders emerged as an issue that had to be presented and explained, but which would not be the subject of a specific debate. The reason was that the selection process could not be altered at this final stage of the work, making it
inopportune the discussion of the matter if an operational outcome were sought. However, one participant (the representative of the regional water administration) criticised the absence from the meeting of decision makers from business organisations and "real (technical) experts in water management". This observation highlighted two important issues: the unavailability of business stakeholders (representing the tourist sector) to take part in the process and the epistemological approach adopted in the study to go beyond the "technical perspective" and conventional scientific knowledge as the priority mechanisms used to solve environmental problems. Although the observation was important because it referred to a key aspect of the exercise, it was not supported by the other stakeholders. The following clarifications and explanations provided by the research team were accepted: a) limit to the number of stakeholders who could be involved in the exercise; b) availability of those who participated in the previous phase; c) the fact that experts were not excluded, as there were technical specialists among the participating stakeholders; d) the aim was to record opinions and judgements beyond those that could be provided by water management experts.

Discussion on diagnosis
A situation diagnosis of the water supply system in the Costa del Sol area was given, based on the points above discussed, i.e. inadequate management of available resources, insufficient coordination among administrations, weak participation mechanisms and lack of control over urban development and insufficient land-use.

The situation diagnosis was discussed extensively, although, in general terms, it was largely accepted and openly defended by some of the participants. It was generally acknowledged that there were tensions and shortcomings in total water cycle management. There was some resistance to the fact that the diagnosis explicitly questioned the notion of scarcity, on which the strategy for the generation of more water resources is based, although it was accepted that an improvement in water management must be accorded top priority.

In addition to a number of important clarifications (the representatives of Acosol, the water supply and sewage company, underlined that certain infrastructures were lacking, and the representative of the consumers' Federation, FACUA, underlined the lack of information and participation), several stakeholders addressed a matter of greater significance, namely the need to fit the situation diagnosis of the Costa del Sol water supply and sewerage system (hydraulic system) within the hydrological system as a whole (quality of the water environment and associated ecosystems). Different arguments were put forward by the representatives of the Genal Valley Working Group and the Provincial Council to support the plea to contextualise the diagnosis of the hydraulic system within the overall hydrological system framework.

This raises the question, among others, of where to draw the boundaries of the problem at hand. Although environmental aspects were taken into account, an essentially hydraulic approach was adopted in the situation diagnosis and identification of alternatives for the total water management cycle (supply and sewerage) in the Costa del Sol area: mechanisms to generate water resources, distribution, treatment, etc. The proposal made during the focus group meeting required the problem to be rescaled, with significant implications for subsequent phases of the debate. As was seen later, one of the new alternatives put forward (reforestation) was related to this new perspective on defining the diagnosis and also raised the question of specifying the problem to a greater or lesser extent, defining its chronological limits and spatial scale.

Discussion on Alternatives
The alternatives were discussed in detail. Some of the stakeholders remarked that the alternatives identified did not respond closely enough to the situation diagnosis, as had been observed in the arguments put forward by some participants in favour of incorporating the general water environment framework and the hydrological cycle as a whole. There was criticism that none of the alternatives sought to improve water quality.

Various stakeholders advocated the addition of the following new alternatives, which were accepted and included in the final proposal of alternatives to be evaluated:

- **Reforestation**, consistent with the call for the hydrological system as a whole to be included in the debate on the situation of the water supply system.
- **'Single authority' for urban hydrological cycle management.** This alternative raises significant implications in the current confrontation (among administrations, among companies) in the area under study, justifying the lengthy debate or this subject.
- **Institutionalisation of user negotiation mechanisms for the reallocation of water resources (water banks).** This is a less controversial proposal than the above, maybe because such mechanisms are not currently involved in the day-to-day wrangling over water resources. The specific functionality of such mechanisms in the area covered by the case study was not detailed, although reference was made to their role in the reallocation of irrigation water to drinking water supply.
Reevaluation of alternatives
Before carrying out a new evaluation including the new alternatives that had been proposed and accepted, the evaluation based on stakeholder positions was repeated, including only the judgements of those present at the meeting. The outcome showed little change, in spite of the fact that seven stakeholders who did take part in the interview and questionnaire exercises were absent from the work session. There was some change in the middle section of the ranking, although the top and bottom (highest and lowest scoring alternatives) remained unchanged. This would seem to indicate that the positions of the absentees did not affect the overall spectrum of the group as a whole.

When the new alternatives (single authority, reforestation and water banks) were introduced in the matrix, the ranking changed significantly. One of the new alternatives (reforestation), actively advocated in the debate by only one stakeholder (Genal Valley Working Group), although not rejected by any, turned out to be the highest-scoring alternative. The highly positive appraisal of this new alternative signifies a very broad coincidence of views. Below this alternative, the ranking remained essentially unchanged. Alternatives involving the generation of new resources by creating new infrastructures remained at the bottom of the ranking (heightening of the La Concepción dam and desalination). The rest of the new alternatives (coordination of authorities and water banks) also finished at the bottom end of the ranking, above the two lowest-scoring alternatives mentioned above.

In view of the results of the new evaluation, a discussion was opened on spatial and time scales of the problem at hand and its solutions. Is the aim to find a ‘specific’ solution to the problem or to approach the issue from a ‘broader’ perspective? There was discussion as to whether ‘specific’ can be considered a synonym of ‘short-term’ and, consequently, a term that, while ostensibly implying the idea of something operational and realistic, actually denotes a lack of insight and a reductionist approach.

While the matrix based on the judgements of the stakeholders – both the one produced on the basis of the interviews and questionnaires and the new one including the new alternatives – were of interest to the stakeholders, they expressed their dissatisfaction with the fact that the evaluation of alternatives based on criteria was not presented. One stakeholder expressed the view that these “subjective results”, while necessary and useful, needed to be supplemented with “technical results”, including economic aspects. The research team attributed the failure to present the matrix based on technical evaluations (impact matrix) to the meeting duration. In order to present and explain the impact matrix, the timescale of the meeting would have had to be extended, making it even more difficult for stakeholders to participate. At any event, as mentioned above, although the impact matrix was calculated as accurately as possible, using all the information that the research team was able to collect, and is useful for the purposes of the study as a whole, the level of verification and technical support was insufficient. The risk of presenting it to actors with specific knowledge of the Costa del Sol water system and the area under study was that it could lead to extremely heated discussion and disputes that would distract from rather than add to the effectiveness of the intended focus group communication exercise.

Stakeholders’ assessment on the focus group meeting
Finally, positive comments were made on the methodology, alongside calls for effective participation mechanisms and criticism of the opacity of water management authorities who failed to attend the meeting. At any event, the absence of several important stakeholders, influenced and limited the real success of the experience. The representative from the University of Malaga emphasised that information on the results of the previous stages of the study should have been sent to the stakeholders prior to the meeting. This observation is consistent with the interest shown by the participants in the information provided at the meeting about the positions of the other stakeholders with regard to the proposed alternatives, highlighting the need for communication among stakeholders in the area.

10.4. GENERAL OUTCOME: SOCIAL MULTI-CRITERIA ANALYSIS FOR INTEGRATED AND PARTICIPATORY EVALUATION OF RIVER BASIN GOVERNANCE

The evaluation of the Costa del Sol case-study’s results is done in the context of its usefulness in implementing the integrated evaluation and participation objectives established in the WFD. Specifically, the validity of the methodology applied will be determined by its ability to (i) facilitate understanding and structuring of problems characterised by conflicting evaluations; (ii) contribute to clarifying the nature of conflicts and creating the conditions necessary to find a meeting point between opposing positions; (iii) promote active participation in all the phases of the decision-making process and enable actors to acquire knowledge of each other and their respective positions; (iv) explore innovative alternatives; (v) deal with different types of information that cannot be amalgamated into a single scale of measurement; and (vi) stimulate learning processes involving the stakeholders and the research team.

This methodology implies that the stakeholder identification process is inextricably linked to the background study and runs parallel to the problem definition stage, as it is the stakeholders who frame the diagnosis of the problem at hand, which, in turn, influences the selection of stakeholders, in a dynamic and cyclic process of feedback loops among
the various steps of the exercise. Different stakeholders will introduce new perspectives in the process, which means that the identification and selection of the participating stakeholders is a key factor in the process and strongly influences the extent to which the results of the evaluation are relevant to the real-world problem under study and, thus, its operational ability to contribute to successful conflict resolution. It is therefore essential that the social actors be identified and selected on the basis of a careful analysis (documents and media analysis, participant observation) of the institutional and power-relations framework in which they operate.

In the Costa del Sol case study, the delimitation of the area under consideration, and therefore the scale of analysis, was dependent on the identification of stakeholders – based on the prior institutional analysis and confirmed and complemented by contributions from the stakeholders themselves – and the alternatives in play. The selection of these stakeholders was not particularly problematic, as there was broad agreement and acknowledgement as to who the relevant actors with legitimate interests in water management in the area are. It should be taken into account that both multi-criteria evaluation and the focus group operate best with a relatively small number of participants, as this prevents the exercise from becoming too complicated.

The selected actors were spokespersons from various organizations, in most cases, the person in charge. The spectrum of organizations involved was very broad, ranging from the top national and regional authorities in water management to local citizens’ groups. The problem of the inevitable subjectivity inherent in such an exercise, stemming from the personality of the actors and their individual perceptions and specific knowledge, was overcome thanks to the cyclic nature of the study and open, collective reassessment of the process. The opinion polls conducted in the area under study were used as a means of introducing the perspectives and judgments of the general public, with a view to complementing the diagnosis made by the stakeholders and measuring the degree of public acceptance of the alternatives evaluated in the process.

Regarding working with the actors, one of the most important factors in the Costa del Sol experience was the lack of availability of some of the selected stakeholders in an environment influenced by a weak participatory culture. On the one hand, it proved impossible to involve key actors, such as the Residential Urban Development and Tourism Federation (Federación de Urbanizadores y Turismo Residencial), representing the most powerful and conflictive economic sector in the area. On the other, some of the actors who took part in the exercise had limited availability, owing to (i) lack of time and scheduling clashes between some of the proposed tasks and their work commitments and (ii) friction and conflict among some of the actors. These problems led to interviews being cut short, delays in returning the written questionnaires and, in particular, failure to participate in the focus group session.

Finally, it must be taken into account that in an exercise that takes around a year to complete, it is quite likely for there to be changes in the top authorities of the entities selected to take part while the process is still underway. In the case of the Costa del Sol Occidental case study, there was a change of president in the Union of Small Crop and Livestock Farmers (UPA) and the Costa del Sol Hoteliers’ Association (AEHCOS), although the former presidents continued to belong to their respective associations, and the head of the Malaga Provincial Office for Public Works and Transport left to work for Malaga City Council. In any case, the actors that were previously involved were invited to assist the focus group session as they did.

10.4.1. Findings regarding problem diagnosis

In the case of the Costa del Sol area, the evaluation processes carried out prior to the Advisor project can be characterised as follows a) they were based on opinions and value judgements underlying and strongly influencing the problem diagnosis; b) they tended to simplify the complexity of ecological and social processes, sidestepping any analysis of the root causes of the problems and possible consequences for natural and social systems; and c) they did not reflect the uncertainty that defines how these systems work.

Taking into account this background, the methodology framework of this case study has proved effective in overcoming these limitations. The open participatory discussion process made it possible to structure the problem, characterised by highly conflicting approaches, and led to new perspectives on the diagnosis of the problem, i.e. the main issue is no longer exclusively or principally a physical shortage of water, but rather poor water resource management, in a context of growing demand. The water debate led to discussion of broader issues relating to development processes (tourist sector, urban development) that are inextricably linked to water issues. Furthermore, when the reflection process became collective (from individual interviews and questionnaires to the collective dynamics of the focus group), the diagnoses became even deeper and more complex.
10.4.2. Findings related to identification of alternatives and criteria

Regarding the identification of alternatives, the number of alternative actions was not limited or preset and, in fact, changed over the dynamic and learning-oriented evaluation process. This promoted the formulation of innovative alternatives and made it possible to progress beyond approaches blinkered by routine and inertia.

The actors proposed a total of twenty alternatives, of which seven were included in the evaluation exercise by the research team (in addition to the “maintenance of the status quo” alternative). The rest were rejected either because they were similar to other proposals that had already been accepted, mainly partial aspects of broader alternatives, or because they did not receive sufficient support from the other actors. The risk of overlooking a relevant proposal was avoided by giving the actors the opportunity, during the focus group meeting, to revise the alternatives that were finally selected and incorporate any others that they agreed should be included. Alternatives added in this way were reforestation, single management authority and water banks.

The identification of criteria was more problematic, probably owing to the complexity of the concept in comparison with that of the alternatives. The initiative undertaken by the research team to formulate a criteria proposal based on the interviews, on which the actors could continue working, proved key to identifying sufficiently precise evaluation criteria in order to make a comparison of the alternatives. Eventually, there were identified eleven criteria of different kinds (economic, environmental, social and institutional), which it was difficult to find quantitative and/or precise information about. Owing to this technical uncertainty, that is, the lack of available information, the NAIADE model was considered to be a very suitable evaluation method, as it is capable of processing information affected by different degrees and types of uncertainty (numerical, linguistic and fuzzy variables), a property of the multi-criteria evaluation tool that was particularly useful in this case study.

A further two criteria, namely degree of public acceptance and degree of institutional difficulty, were also added. With regard to the first, it should be noted that the opinion poll conducted as part of the study was quite significant, because it revealed that the problem was not viewed in the same way by the stakeholders as it was by the general public and because it provided an insight into the perceptions of people not only in the area under study, but also in the rest of the province, including rural areas. This introduced an original and novel element of interscalability in the exercise. The institutional difficulty criteria – defined as the time required to study, process and execute the proposals, the system of subsidies and cost recovery, the number and heterogeneity of entities involved and environmental impact requirements – made the evaluation exercise closer to real conditions, as it took into account the constraints and limitations that would affect the implementation of the alternatives.

10.4.3. Preliminary evaluation of alternatives

The evaluation of alternatives made using NAIADE highlighted the lack of coherence between the diagnosis made and agreed on by the stakeholders throughout the study and the alternatives that were actually predominant. In other words, the solutions advocated by the public authorities to redress the water supply problem in the Costa del Sol area did not coincide with the solutions that best responded to the selected multiple criteria and did not satisfy the stakeholders with legitimate interests in decision making, a fact that they made clear in the participation process. This led the research team to identify institutional pressure as a key factor in the situation, resulting from short-term considerations and the ensuing lack of hydrological planning formulated within a reference territorial planning framework. On the contrary, the reflection and learning dynamics set in motion by the participatory multi-criteria methodology revealed a considerable ability to combat inertia and mainstream trends in the current decision-making system.

With regard to the analysis of coalitions among stakeholders, it should be noted that an examination of existing conflicts revealed a split between the administrations responsible for water management. On the one hand, there was a possible coalition including the Regional Water Department (regional administration), which opposed the management policy of the Confederación Hidrográfica del Sur (central administration), as the position held by the latter showed a leaning towards alternatives involving an increase in the supply of water resources. This split cannot, however, be explained solely by political factors. For example, Acosol (Costa del Sol public water supply and sewage company) held a prominently individualist position, refraining from forming part of any coalition, in spite of its political affinity with the regional administration.

10.4.4. Findings regarding the focus group session

In the focus group meeting, two considerations key to the analysis of this evaluation exercise were detected. First, when the stakeholders were confronted with the final list of alternatives that had been worked on, they suggested the inclusion of other alternatives initially proposed by a small number of stakeholders, but not included by the research team in the final evaluation exercise precisely because they had not enjoyed extensive support. Following an open debate, one of
these alternatives (reforestation of catchment’s basins) figured among those receiving most support from the participating stakeholders. This shows that the latter phase, in which all stakeholders meet, can significantly change the final result, as issues overlooked during the individual contacts were raised and debated. Second, in this phase of the participatory process, the absence of certain sectors and, indirectly, the conflicts existing among them, were noted. These stakeholders, who had also been reticent to attend the initial individual meetings (interviews, questionnaires), belong mainly to the tourist sector and, more significantly, to the authority responsible for water management in the area, the Confederación Hidrográfica del Sur.

10.4.5. Final comments

The evaluation process carried out in the Costa del Sol case study was cyclic and deliberative, becoming a mutual learning exercise both for the participating stakeholders and the research team. It upholds the principle that stakeholder participation enriches the evaluation thanks to the multiplicity of perspectives, skills and expertise that it combines. The participants therefore consider themselves co-producers of the knowledge along with the research team.

The main results of the exercise can be synthesised as follows: (i) it contributed to clarifying the nature of conflicts and creating the conditions necessary to construct a dialogue process among the stakeholders more permanently involved and to find a meeting point between opposing positions and (ii) it promoted active participation in all the evaluation’s phases and enabled stakeholders to acquire knowledge of each other and their respective positions.

In the joint session held, the stakeholders showed a flexible attitude towards accepting proposals, opinions and judgements offered by the other participants. One remaining question is whether their attitude would be as flexible if they were taking part in a real-world decision-making process.

The main difficulty encountered during the work was the highly conflictive atmosphere surrounding the water management issue. In the case of the Costa del Sol, this water conflictive arena overrides an extraordinary territorial (land use) conflictivity. The shortage of water resources and the competition for them can be attributed to growing demand resulting from rapid, uncontrolled urban and tourism development, in which strong economic, social and political interests are at stake and which is characterised by a lack of transparency and recurrent incidents of irregular conduct. These characteristics, coupled with the institutional framework of the public water administration, explain why it was particularly difficult to gather relevant information. They also explain the limited availability of certain stakeholders to participate in the study, particularly in the final collective reflection phase. The application of this methodology to the Costa del Sol Occidental case study therefore also highlighted the barriers that prevent the effective implementation of this type of evaluation.

In summary, in the case study analysed, the methodological approach proved to be a useful tool specially in structuring the problem at hand in a collective, flexible and cyclic way and eventually dealing with water management conflicts, as it improved the quality and effectiveness of the information interchange and the reflection process. In this way, it can contribute to determining which policy decisions could be best defended before all the stakeholders and the general public, thus reducing the degree of discrepancy and achieving a certain level of consensus. By opening the social debate on water resource allocation and by mapping all the implications, issues and interests involved, it is possible to find alternatives that overcome inertia and look beyond short-term considerations, while rationalising social conflict and resistance.
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