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Water Services, Stakeholder Preferences and Conflicting Interests: Importance of Public Participation in Water Management

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Abstract

The Water Framework Directive (WFD, 2000/60/EC) is a piece of European legislation created to ensure the sustainable use of water resources in the European Union. A central guideline included throughout the directive is a call for the participation of stakeholders in the management of these resources. Involving stakeholders is an important step to ensure that catchment management plans take into consideration local experience in the development of these plans and the impact of the plans on local interests.

The decision support tool, CATCH, is a model for water management in a catchment area. It was developed for structuring a dialogue as a method for stakeholder participation in the management process. It operationalizes principles of

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deliberative democracy into a framework that promotes discourse and deliberation while maintaining a focus on organizational tasks. This discussion of issues in strategic settings facilitates implementation of the WFD at a catchment level. To test the usefulness of the stakeholder participation model CATCH, a sub-catchment in an alpine valley in the north-east of Italy was chosen as the setting for a series of workshops. This test of the CATCH model showed it to be a dynamic and flexible tool, useful for structuring and guiding the participation process, without imposing undue restrictions on influencing the outcome of stakeholder participation in a small catchment.

Key words: Stakeholder participation, water management, deliberative democracy

1. Introduction

The Water Framework Directive (WFD, 2000/60/EC) was created to ensure the sustainable use of water resources in the EU. A central guideline included throughout the directive is a call for the participation of stakeholders in the management of these resources. Involving stakeholders is an important step to ensure that catchment management plans take into consideration local experience in the development of these plans and the impact of the plans on local interests. Now that implementation of the Water Framework Directive is on the agenda for national authorities in EU member states, one of the questions that arise in the development of the mandated management plans is how to achieve the socio-economic and ecological sustainable use of water resources, and at the same time promote stakeholder participation in management decisions (Löwgren 2005).

The main purpose of public participation "is to improve decision-making, by ensuring that decisions are soundly based on shared knowledge, experiences and scientific evidence, that decisions are influenced by the views and experience of those affected by them, that innovative and creative options are considered and that new arrangements are workable, and acceptable to the public" (European Commission 2003, p 14).

Even though the benefits and advantages of public participation in decision-making are well-known and widely recognized, it is necessary to organise the participatory process in the right way in order to achieve these. If public participation is not managed well, it can result in a limited and unrepresentative response from the public and in an ill-informed response. If the tasks of public participation are not fulfilled and if public input is not taken seriously, the public may get disillusioned and which may result in less trust in government, less public acceptance, more implementation problems, and less social learning (Mostert 2003).

Many of the tasks of the WFD and, in particular, the tasks concerning public participation are new and often there are no useable methodologies, tools or methods, or even where these exist they may differ significantly from country to country or even within countries. The guidelines offered by the European Commission need to be elaborated on further in order to ensure their successful application. This paper presents the results of a research project that was initiated to develop a participatory water management process to meet the provisions of the WFD. The first section provides a background to previous work with public participation processes with a focus on their relationship to democracy. This is followed by a description of a particular participation model, CATCH and a description of a pilot study where the

model was applied in a series of three workshops in a small sub-catchment in the North-East of Italy. The paper ends with a discussion of the results of the pilot study and the utility of the CATCH model.

2. Public Participation in Resource Management

Public participation has become an increasingly important aspect of natural resource management (Chess and Purcell 1999; Lawrence and Deagen 2001; Redpath et al. 2002; Chase et al. 2004; Darnall and Jolley 2004; Broderick 2005; Charnley and Engelbert 2005; Koontz 2005). Within an historical context, public participation in natural resource management decision making have gone through several phases. "The pre-World War II period was marked by a high degree of optimism about scientific expertise and the merits of technology that would eventually lead to improvements in efficiency, environmental quality, and quality of life. This highly scientific approach to decision making left little room for public participation, since such activities were viewed as unnecessary roadblocks to technological progress" (Parkins and Mitchell 2005, p 531). During the post-World War II period, enthusiasm for broader public involvement in decision-making began to increase, reaching a peak with the environmental movements of the 1960s and 1970s. "The social consensus regarding natural resource use began to disintegrate in the face of more diverse and often conflicting public values. In turn, resource managers scrambled to respond to a growing public appetite for access to decision-making processes" (Parkins and Mitchell 2005, p 531).

Beierle (1999) identifies three reasons that explain the increased use of public participation in natural resource management of the last decades:

- The changing nature of pressing environmental priorities has led to a shift in focus from large point sources of pollution to more diffuse and widely distributed sources. This means that new environmental problems are complex and not conducive to centralized hierarchical decision-making.
- There is an emerging realization that lay people and experts bring valid but different perspectives to decision-making. "Even the most technical tools of environmental decision making - risk assessment and cost-benefit analysis – require significant subjective judgements that are most appropriately made with explicit attention to public values" (Beierle 1999, p 77).
- It can be very difficult to elaborate and implement projects with environmental impacts if such projects exclude a legitimate public voice in the decision-making process. "Public participation may be one of the most effective ways to find alternatives to the *not in my backyard* (NIMBY) syndrome […]. Often, public opposition is a symptom of the public's legitimate mistrust of the willingness or ability of government and industry to manage risks appropriately" (Beierle 1999, p 77).

Public participation is an interactive process that can take various and different forms, from limited consultation to active involvement in the decision-making process. Public participation "implies sharing of authority, in which government acknowledges the right of people to a voice in issues likely to affect their interest. Yet the details of implementation reveal contending meanings of participation. There are questions of levels of the degree of power sharing, and of the relationship between traditional representative and new consultative processes" (Bishop and Davis 2002, p 16).

McDaniels, Gregory and Fields (1999) write that there is a continuum of public involvement practices; one extreme involves group processes, relying on consensus among participants as decision rule. They write that with respect to the most extreme form of this approach, the decision process adopted by a particular group should be entirely designed by the group itself (McDaniels et al. 1999). The polar opposite from consensus processes, allows public participation only in the form of specific, formally structured value judgements (McDaniels et al. 1999). The latter approach is standard practice for social benefit/cost analysis based on welfare economics, with respect to natural resource management. This approach "relies on methods such as contingent valuation or cojoint analysis to elicit stakeholder values for non-market goods. While this technique may be of use for valuation of a specific allocation alternative or a comparison of discrete alternative, the only involvement in the decision process is to provide monetary values for the alternatives. The opposite end of the spectrum, where participation is predicated on consensus rules, places value not only on the outcome of the decision but also on the process as well" (Collentine et al. 2002, p 449).

The CATCH model (Collentine et al. 2002; Lupo Stanghellini, 2007) focuses on the public involvement approach described above by McDaniels, Gregory and Fields (1999) and promotes the active involvement of the stakeholders in water management, as it is encouraged in the Water Framework Directive. In spite of this specific feature it shares much in common with other models for stakeholder involvement. There are two classes of models with regard to public participation: "those which are intended to evaluate management outcomes based on specific catchment characteristics and those intended to assist with the process of evaluation. Common to all of these models is that there is an aspect of conflict resolution embedded in them" (Collentine et al.

2002, p 451). Since natural resource management presupposes in almost every situation the presence of conflicting interests, all the models that deal with stakeholder involvement take into account the problem of conflict resolution however how explicitly the conflict is described by the model is a distinguishing characteristic of each individual model. The CATCH model belongs to this second class of models and shares much in common with other methods within this class.

The increasing practical and academic interest in public participation and new forms of decision-making includes discussion about the relationship of this type of process to principles of democracy. Representative democracy operates through the election of representatives to speak and act on behalf of an electorate and is the most typical form of democracy in most of the Western world (Nanz and Steffek 2004; O'Dwyer 2005) and participation. Pateman (1970) observes that while participation is essential for meaningful citizenship it has a very small role in representative democracy. In fact for the majority of citizens participation in this system is reduced to voting in political elections (Barber 2003; Nanz, and Steffek 2004).

Participation, instead, is a key element in participatory democracy; in fact "Participatory (or participative) democracy argues for a much greater degree of citizen participation in the political system but accepts that the ultimate decision-making and law-creating functions must be handled by a small body of elected representatives" (O'Dwyer 2005, p 29). Participatory democracy differs from representative democracy by its greater emphasis on the right of citizens to participate in the planning of policies, even though it does not stipulate any qualitative requirements for participation (Lehtonen 2006). Dodds (2004) argues that at a broad political level,

Western democracies are slowly moving from representative democracy to participatory democracy.

"Deliberative democracy is founded on the ethical conviction that people should have the right to directly influence decisions that affect them and hence participate in policy making" (Lehtonen 2006, p 187). Dryzek (2000) writes that "around 1990 the theory of democracy took a definitive deliberative turn. Prior to that turn, the democratic ideal was seen mainly in terms of aggregation of preferences or interests into collective decisions through devices such as voting and representation. Under deliberative democracy, the essence of democratic legitimacy should be sought instead in the ability of all individuals subject to a collective decision to engage in authentic deliberation about that decision. These individuals should accept the decision only if it could be justified to them in convincing terms" (p 1).

O'Dwyer (2005) writes that "deliberative democracy, sometimes termed discursive or dialogic democracy, refers to a system of political decision involving some trade-off of consensus decision making and representative democracy. It argues that legitimate law making can only arise from the public deliberation of free and equal citizens. Legitimate decisions are ones that everyone should accept or at least not unreasonably reject" (p 29).

Lethonen (2006) argues that for democracy to be deliberative, neither voting in elections nor participation in the policy making process is enough, because participation and deliberation must fulfil certain basic requirements, in line with the following three core propositions:

a. "some form of communicative or communicative rationality, rather than bargaining between competing interests, should guide the political procedure;

b. the essential political act – the giving, weighting, acceptance, or ejection of reasons – is a public act, as opposed to the purely private act of voting;
c. deliberative democracy is democratic deliberation, not deliberation without modifier" (Lethonen 2006, p 186).

With respect to the differences between deliberative and participatory democracy, the most important feature that distinguishes deliberative democracy from participatory democracy is the key assumption of the mutability of interests and the potential for the discovery or construction of common goals among participants (Lethonen 2006, p 187).

The CATCH model operationalizes principles of deliberative democracy into a framework that promotes discourse and deliberation while maintaining a focus on organizational tasks The deliberative democracy principles are fundamental to achieve two goals: first of all they legitimise the decision that are taken and make the decision process more transparent, and secondly they increase the cognitive knowledge for making decisions through the local, lay knowledge provided by participants.

3. The CATCH model

The CATCH model is a qualitative tool (see Collentine et al. 2002 or Lupo Stanghellini 2007) that uses interaction among people in order to generate data. It has been designed for use with small groups (six-twelve people) and may be used as a complement for large group settings in a way similar to the use of focus groups as a complement to valuation studies. The result of the small group setting using CATCH can serve as information that may then in turn be used for revealing and shaping preferences in another small or larger group setting. The primary goal of the CATCH

model is to develop a common set of definitions, a common language, which may serve over a period of time for planning, as well as approval of specific measures. In order to achieve this, socio-economic parameters and the relationships between these parameters are defined by stakeholders. In the CATCH model the role of values is central. The process builds on stakeholder values (or interests), which are constructed by the stakeholders themselves.

The core of the CATCH model is the development and the application of a series of matrices. The first step is the identification of the relevant socio-economic parameters which describe the relevant goals for evaluating management alternatives in the catchment area. The definition of the socio-economic parameters is a dynamic process. Stakeholders are required to define an inclusive but limited set of parameters, which may be used for evaluation. From an initial listing of possible objectives, which includes all suggestions made by stakeholders, the facilitator's task is to assist with consolidation of the list by looking for similarities between suggested parameters. If agreement is based on a consensual rule, then arguments and dialogue are the techniques used to arrive at a common set of parameters, which through their definition include the entire set of stakeholder objectives. The result is a set of commonly accepted definitions, which provide a language for stakeholders to use for deliberation over allocation and management decisions. The definition of parameters allows the inclusion of local knowledge and preferences into the model. It is important to point out that the list of parameters may be revised at a later stage and if at any point in the process it becomes apparent that either a parameter is redundant or missing, it is also possible to change the parameter definition.

Once a set of socio-economic parameters has been agreed upon, the next step is to evaluate the relationships between them, analysing what effect a change in one parameter has on the remaining parameters. The relationships are decomposed into two spatial components, regional and local effects, in addition to positive and negative changes in individual parameters to describe the range of the relationships. The local factor refers to the effect on the specific sites where the measures have a direct impact, a particular area in a sub-catchment for example. The regional factor is the impact on the entire catchment area. The range of the impacts is analysed by discussing how a negative change in one parameter may impact the other ones and then by following up on this by discussing the effect of a positive change. Since there is no reason to assume that the impacts interact, each impact is discussed as a separate event. These relationships are analysed by constructing a series of matrices. There are four possible types of effects in the relationship between two variables: a positive effect (+) indicates that a change in the row variable leads to an increase in the column variable, a negative effect (-) indicates that a change in the row variable leads to a decrease in the column variable; an insignificant effect (0) indicates that a change in the row variable leads to an insignificant effect in the column variable; an indeterminate effect indicates that it is not possible to establish which effect a change in the row variable has on the column variable (see Tables 4-1, 4-2 and 4-3).

After constructing the series of matrices, the next step is the definition and evaluation of measures, with a process similar to the form used for defining and evaluating the socio-economic parameters. The first task is to define general types of measures, which may be of interest; their description may require additional input from experts or catchment interests groups. It is important to know how these

measures are expected to affect change before the quality of the changes on parameters can be evaluated. At this stage it is sufficient to describe the measures generally, but in later stages the same method may be used to evaluated site specifically measures. This is one of the strengths of the model: it may be used for general planning of a more long run nature as well as provide an analytical framework for the evaluation of specific measures.

The measures are then evaluated against the socio-economic parameters. These relationships are analysed by constructing a matrix (see Table 4-1 and 4-2). As in the matrices for the evaluation of the relationships among parameters, there are four possible types of effects in the relationship between measures and socio-economic parameters: positive, negative, insignificant or indeterminate. The definition and evaluation of the parameters serves to define the systems supported by water services in the catchment. Through collective definition of the parameters, valuation is extended from the individual level to a public level. The complexities of water service allocation decisions are captured in the model by analyzing the relationships between parameters, spatially as well as quantitatively, and structuring this information into a set of matrices. Alternative management measures and strategies may be evaluated through the use of the matrices. The decision support for the stakeholders, provided by the model, is twofold: it serves as a structure for the analysis of the effects in the catchment for alternative allocation of services and, perhaps most importantly, it develops a stakeholder constructed language for discourse and deliberation over allocation alternatives.

4. Implementation of the CATCH model in the Alta Valsugana catchment

To test the usefulness of the CATCH model, a sub-catchment in an alpine valley in the north-east of Italy, the Alta Valsugana in the Province of Trentino, was chosen as the setting for a series of workshops. The Alta Valsugana has an area of 394.45 km^2 and a population of 45,653 inhabitants, spread out over twenty different political municipalities. The main economic activities are agriculture (mostly apple and berry production) and tourism. Secondary activities include animal grazing (cattle and sheep) and small industrial and manufacturing sectors. The main tourist attractions of the area are several small alpine lakes (the most well known are the lakes Levico and Caldonazzo), where it is possible to swim and engage in other water based recreation, such as sailing, wind-surfing, diving and fishing. The Alta Valsugana is also quite well known for its thermal baths and resorts and a few small ski resorts in the mountains that surround the valley. However, tourism is mostly concentrated to the summer season. The Alta Valsugana is also an important route of communication as it connects Trento (the main city of the region) with Padova, Venice and other important cities of the Veneto Region. Transport occurs on a highly trafficked motorway and a railway which both follow the Brenta River, the main tributary that runs through the Alta Valsugana. In addition, there are also a few small hydro power plants operating in the valley.

In the Alta Valsugana, water is fundamental for activities associated with agriculture, domestic use, energy production, sports and recreation. In the recent past the valley has had serious problems related to water quality and quantity. The lakes and rivers have had serious pollution problems, for example the lake of Caldonazzo suffered from eutrophication. Water scarcity is also a problem in some of the

municipalities during the summer season, the time of year when tourists are most numerous. In addition hydropower plants in the valley modified the run of some rivers, causing problems to fish life and to the ecosystems in general. Currently, most of the problems have been mitigated; all the wastewater discharges are treated, farmers use less fertilizer and pesticides and more restrictive regulation (a new minimum level for the outflow of water) was adopted to mitigate the problems caused by the hydro power plants. The water quality status of the valley is presently satisfactory, although possible to improve.

The Alta Valsugana sub-basin was chosen for this study because it presents a diverse set of water uses: agriculture, tourism and recreation, animal grazing, small industrial and manufacturing activities and thus represents a suitable testing ground. Furthermore, even though, according to the data of the Division of Information and Environment Quality of the Environmental Protection Agency of the Autonomous Province of Trento, the quality of the water of the sub-basin is quite good, it needs to be improved or, at the least, to be kept at the current level. This requires serious efforts from all the stakeholders of the area. It was thought that in this particular situation the CATCH model could demonstrate all its potential and play a very important role in helping stakeholders structure the participatory process, in order to elaborate and evaluate measures aimed at improving the quality of water in the area.

The first step in the implementation of the CATCH model was the use of a new stakeholder analysis methodology developed to identify the relevant stakeholders (for a description and a case study using this methodology see Lupo Stanghellini 2007 or Lupo Stanghellini and Collentine 2007). Following the stakeholder analysis, a two round CATCH implementation process was organised. In the first round described

below, representatives of the municipal councils of the sub-catchment were invited to participate in the test and implementation of the model. In the second round, other stakeholders of the area were invited to participate in the task of implementing the CATCH model (for a description of this second round and comparative analysis of the two rounds see Lupo Stanghellini and Collentine 2007). Each round was divided into a series of three workshops each. Each workshop lasted between two and two and half hours. The workshops were set for a weekday, and after working hours (after 6:00 pm) in order to avoid the problems of lost work time and reduce the impact on stakeholders' free time.

The first round of workshops took place in Spring 2006 and involved the representatives of the twelve municipal councils of the area. The participation rate was very high; eight representatives took part in the first workshop, nine in the second and eight in the third. Ten municipalities of the twelve that were invited to take part in the implementation process participated in at least one workshop.

At the first meeting the facilitator went through four presentations concerning the WFD, the provisions for public participation, the CATCH model, and a description of the implementation process. The stakeholders were then shown three maps: first the map of the sub-basin, a map describing the concentration of the different economic activities in the sub-basin area (farming, fruit growing, industry, handicraft, tourism and commerce) and a third map which described eco-systemic sensitiveness. This third map showed the areas with very low, low, medium high, very high eco-systemic sensitiveness. All these maps and data were shown in order to give stakeholders an overview of the socio-economic-environmental situation of the sub-basin.

After answering a few questions, the facilitator then asked the stakeholders to think about water uses, functions and values with respect to the sub-basin. This information would be used to define a limited (no more than six to eight) set of parameters. With respect to the original version of the CATCH model these parameters incorporated only two of the three dimensions of sustainable development: the social and the economic dimensions. In order to make the parameters more complete and inclusive, it was decided to introduce an environmental component. In this way the CATCH parameters would become socio-economic-environmental parameters and this would make it possible to capture three dimensions with the modified model.

In a brainstorming session the stakeholders analysed and discussed each of the parameters identified and worked out the following list of parameters and definitions:

- *Household use*: drinkable water for domestic and sanitary use;
- *Use for agricultural activ*ities: irrigation;
- *Use for tourism and recreation*: landscape attractiveness, use for recreation and sports activities;
- *Use for fruits processing working activities*: refrigeration;
- *Biodiversity*: richness of animal and plant species;
- *Vulnerability of springs (quality)*: maintenance of the current quality;
- *Water scarcity (quantity)*: water scarcity.

It is important to remember that CATCH is aimed at consensus building, for this reason during the entire implementation process the facilitator always tried to obtain definitions and decisions upon which there was general agreement. The participants engaged in lively discussions about the parameters and definitions but in the end it

was not difficult to agree upon a common list. During the discussion, stakeholders' knowledge of the geo-morphological features and economic activities of the area became apparent.

The second workshop began with a request by some of the stakeholders, who had thought more about the list of parameters after the first meeting, realised that something was wrong and asked if it was possible to make some changes in the list. The ensuing discussion which led to some minor adjustments in the parameter definitions was an indication that stakeholders were very interested in the CATCH process. They assigned importance to what they were doing and because they believed that the project could be useful, they should be precise and careful and do *their best*.

After this discussion and redefinition of parameters the first matrix was completed, which describes what effect a positive change in each parameter has on all the other parameters (see Table 4-1). In this matrix, an increase in the use of water for domestic and sanitary purposes (domestic use) is expected to have an insignificant effect on water used in agriculture, for tourism and recreation or for the processing of fruits as indicated by the zeroes in the respective box in Table 4-1. However, stakeholders pointed out that household water and the water used in agriculture fruit production come from different springs. An increase in the use of household water is therefore expected to have an insignificant effect on the vulnerability of springs, while it is expected to have a negative effect on biodiversity and on the availability of water (as indicated by the minus signs in these two boxes in Table 4-1).

After finishing the first matrix, a second one was built, which describes what effect a negative change in each parameters has on all the other parameters (see Table 4-2). As can be seen in this matrix, a decrease in the water used for recreational and

sports activities is expected to have an insignificant effect on the overall availability of water, while it is expected to have a positive effect on biodiversity and on the vulnerability of springs (pluses in Table 4-2). Stakeholders indicated that a decrease in tourist pressure is expected to produce positive effects on biodiversity and springs. However, the stakeholders could not establish what effect a decrease in the use of water for recreational and sports activities would have on the water used for agricultural activities.

Upon completion of the second matrix, some stakeholders noticed that the rows and columns related to the water used for the processing of fruits had only zeros. This meant that both a positive and a negative change in the water used for fruit processing had insignificant effects on all the other parameters. In addition, both a positive and a negative change in all the parameters also had an insignificant effect on the water used for the processing of fruits. This observation led to a discussion among stakeholders with respect to the parameter used for fruit processing activities: refrigeration. It was decided that this parameter should be considered as secondary and be deleted from the socio-economic-environmental parameters list (which included the most important variables).

The third workshop began with a further revision of the socio-economic-environmental parameters list. Stakeholders made some comments about the imprecision of the definition of the availability of water (quantity): quantity of water overall available (springs, rivers, lakes, etc…). They argued that the term springs should be replaced by the term reservoirs, which was more suitable, in relation to the definition of availability of water. After discussion, an agreement was reached and the old definitions were replaced by the new ones.

Finally the stakeholders were asked by the facilitator to think about the relationships shown by the matrices and try to work out a limited set of measures aimed at improving the quality of water of the sub-catchment and, in general, for water management of the sub-catchment area. The discussion about measures was very active and lively. During the discussion a lot of information about the most serious environmental problems of the area came out; for example the stakeholders pointed out that, during summer, some municipalities had problems of water scarcity. It was also pointed out that, while some municipalities had an abundance of water, others had problems related to water scarcity. During the debate many different opinions and points of view about priorities were expressed. In the end partial agreement was arrived at on a list of measures:

- Improving awareness of citizens
- Incentives to improve technology
- A new pricing policy (an increase in water pricing when the consumption of water exceeds a certain amount)
- Reduction of losses of water
- Creation of a basin-wide water distribution network (instead of the current municipal water distribution network)
- Installation of turbines on the channels of the water distribution network in order to recovery energy
- Traffic reduction
- Improvements in scientific research and technology which would lead to less polluting fertilizers and pesticides

- Prolongation, extension of the tourist season, in order to spread out the tourist pressure over more months
- Limits and restrictions on urban and industrial expansion (classification of the areas with serious environmental problems)

These measures were then evaluated against the socio-economic-environmental parameters, by constructing a new matrix as shown in Table 4-3.

As can be seen in Table 4-3, measures aimed at making citizens aware of the importance of water issues and of water problems are expected to have a positive effect on the water used for domestic use and agriculture, as well as on biodiversity and overall availability of water, while this measure is expected to have an insignificant effect on the maintenance of the current quality of springs (vulnerability of springs). The extension or prolongation of the tourist season is expected to have a positive effect on water used for domestic purpose and for tourism and recreation as well as on biodiversity and on the overall availability of water, while it is expected to have an insignificant effect on the maintenance of the current quality of springs (vulnerability of springs) and on the water used for irrigation (agricultural use). After the building of this last matrix there was a discussion about the results and an evaluation of the whole CATCH implementation round.

5. Discussion

The CATCH model implementation process in the Alta Valsugana gave a realistic and concrete idea of how participatory decision-making process may be organised and managed. In Italy and in all the countries where there is no widespread tradition with respect to natural resource management, people are not familiar with participatory

processes and methodologies. It may be foolish to *throw* stakeholders into a participatory process with a lot of numbers, costs, numeric trade-offs, etc… There is a concrete risk of frightening, confusing, or disconcerting them. In addition, this may lead to the creation of conflicts and misunderstandings.

The stakeholder analysis sessions and the CATCH workshops were a rather new experience for the participants, who had to deal with both the principles of the WFD in general and the participation requirement in particular. During the workshops the CATCH model played a very important role in structuring the participatory process. It provided a general framework consisting of a sequence of steps that helped the participants to reach the goal of the process; the identification and evaluation of measures to improve water management in the catchment. The stakeholders who took part in the meetings found the CATCH method to be a useful tool to organise and structure public participation, avoiding the risk of a chaotic and confused discussion where it is impossible to reach a result. At the same time, the flexible structure of CATCH did not force the discussion to remain within rigid borders and did not influence the results, but rather allowed the participatory process to be free. It is also important to note that the particular structure of the CATCH model, which allows the stakeholders at any time to modify the number and definitions of measures and parameters and to make changes in the analysis of the relationships among parameters and measures, promoted a methodical but extremely dynamic (always *in fieri*) discussion. This helped the stakeholders to develop a common language and to reach broad agreement (consensus) with respect to the issues that were discussed. In summary, this test of the CATCH model showed it to be a dynamic and flexible tool, useful for structuring and guiding the participation process, without imposing undue

restrictions on influencing the outcome of stakeholder participation in a small catchment.

The CATCH implementation process showed that, in order to organise a good participatory process, it is necessary to pay particular attention to six key elements:

1) Identification, classification of stakeholders and individualization of their role in the implementation process (Stakeholder analysis)
2) Recruitment of stakeholders
3) Organisation of the participatory sessions
4) Structure of the participatory process
5) Role of the facilitator
6) Trust in the usefulness of the participatory process

With respect to the stakeholder analysis, it is important to identify and classify all the stakeholders of the area in order to establish the roles they should have in the participatory process (see Lupo Stanghellini 2007). The stakeholder analysis is fundamental in order to avoid the risk of forgetting relevant stakeholders or involving stakeholders in the wrong way, causing the failure of the participatory process. It is also very important to pay attention to the recruitment of stakeholders. It is not enough just to identify stakeholders; the task is to involve them. The most appropriate way of recruitment should be chosen according to the different situations. Personal contact is almost always recommended, because it is more direct and may help the trust building process. When personal contact is impossible, then phone contact is suggested.

The organisation of the participatory process is very important and needs to be planned in detail. It is important to organise the participation process in a way that avoids the problems of lost work time and that reduces impact on stakeholders' free

time. Furthermore, if the participatory process requires much time, it is recommended to split the process up into two or more workshops, which should not last more than two hours or two and half-hours, in order to avoid the risk of tiring out stakeholders. With respect to the location, the participatory process should be organised in a place easy to get to, comfortable and adequate for the number of participants and the purposes of the participatory process. In areas where they may be many lively conflicts, a *neutral* place, should be chosen.

The participatory process needs to be structured in a rational and functional way in order to work and produce valuable results. In this sense, it is useful to use models or tools which structure the participatory process, providing a general framework consisting of a sequence of steps that may help stakeholders reach the goals of the process. It is important to avoid the risk of chaotic and confused discussions where it is impossible to reach a result. Often, when the participatory meetings are totally free and relatively unstructured, the risk of an unorganised participation process may be high. There is a concrete necessity to structure and guide the process, in order to reach the goals and produce useful results. Nevertheless, the tools and models chosen to structure participation should not be too rigid, and should not force the discussions to remain within rigid borders or influence the results, but rather they should allow the participatory process to be free. It is also important to underline that these tools and models should be as easy to use as possible. When they are too complex and difficult to use and understand, there is the risk of a failure of the participatory process. Stakeholders should concentrate on the participatory tasks and not on the structure or on the way of working with the participatory model or tool. Furthermore, a participatory model or tool should be flexible and able to adapt to the different

situations and features of the process. A rigid model or tool could heavily influence the process and the outcomes.

The role of the facilitator is very important, because the facilitator has to provide an overall structure for the decision process. The facilitator's role may at times need to be that of a completely neutral arbitrator at other times to play a more active or participatory role, it depends on the nature of the process and on the features of the tools and models used to structure participation. Furthermore, it is important to emphasize that the facilitator should be a skilled analyst, a good listener and be able to provide an appropriate environment in which participants feel they can speak freely.

In order to have a successful participatory process it is important to make participants sure that their inputs will be taken seriously by decision-makers. Otherwise, the stakeholders may be disillusioned and there is the risk of a failure of the participatory process. It is important to build a *trust environment* and to make stakeholders believe that what they are asked to do is useful, necessary and that it will be taken into account in the decision process.

The results of the CATCH implementation process showed that the model may be successfully used as a complement for quantitative evaluation studies, in order to implement the WFD, with particular attention to the draft of the River Basin Management Plan. The CATCH model should be implemented in the beginning of the implementation process, in order to identify and classify the stakeholders and assign them an appropriate level of involvement through the stakeholder analysis methodology. Then the CATCH implementation steps may help stakeholders to get to know each other, to share knowledge, information and ideas, and to develop a common set of definitions, a common language. All of which will help to improve

their ability to search for consensus, to arrive at agreement, to make the stakeholders familiar with the alternatives evaluation and to see in reality how a participatory process is structured and how it works. After the CATCH implementation process it may be useful to introduce quantitative methods or tools, in order to re-analyse the CATCH measures, definitions and decisions from a quantitative perspective, in order to reach final decisions on river basin management.

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Table 4-1. Cross effect of positive changes in socio-economic-environmental variables. Results of the 2nd workshop of the 1st round

(+ = positive effect; - = negative effect; 0 = insignificant effect; +/- = indeterminate effect)

Positive change (increase, improvement)	Domestic use	Agricultural use	Tourist and recreational use	Fruit processing use	Biodiversity	Springs vulnerability	Availability of water
Domestic use	■	0	0	0	-	0	-
Agricultural use	0	■	-	0	-	0	-
Tourist and recreational use	0	0	■	0	-	-	0
Fruit processing use	0	0	0	■	0	0	0
Biodiversity	0	0	+	0	■	+/-	0
Springs vulnerability	0	0	+	0	+	■	0
Availability of water	+	+	+	0	+	+/-	■

Table 4-2. Cross effect of negative changes in socio-economic-environmental variables. Results of the 2nd workshop of the 1st round

(+ = positive effect; - = negative effect; 0 = insignificant effect; +/- = indeterminate effect)

Negative change (decrease, worsening)	Domestic use	Agricultural use	Tourist and recreational use	Fruits working processing use	Biodiversity	Springs vulnerability	Availability of water
Domestic use	■	+	+	0	+	0	+
Agricultural use	0	■	+	0	+	0	+
Tourist and recreational use	0	+/-	■	0	+	+	0
Fruits working processing use	0	0	0	■	0	0	0
Biodiversity	0	0	-	0	■	+/-	0
Springs vulnerability	-	0	-	0	-	■	0
Availability of water	-	-	-	0	-	+/-	■

Table 4-3. Effect of measures on socio-economic-environmental variables. Results of the 3rd workshop of the 1st round

(+ = positive effect; - = negative effect; 0 = insignificant effect; +/- = indeterminate effect)

Parameters / ***Measures***	Domestic use	Agricultural use	Tourist and recreational use	Biodiversity	Springs vulnerability	Availability of water
Awareness of citizens	+	+	+/-	+	0	+
Incentives to improve technology	+	+	0	+	0	+
A new pricing policy	-	-	0	0	0	+
Reduction of losses	+	+	0	0	0	+
Creation of a basin water delivery network	+	0	0	0	0	+
Installation of turbines	+	0	0	0	0	+
Traffic reduction	0	0	+	+	+	0
Improvements in scientific research and technology	+	0	+	+	+	0
Extension of the tourist season	+	0	+	+	0	+
Limits and restrictions on urban and industrial expansion	+	0	+	+	+	+