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**SOCIAL PROCESSES FOR ENVIRONMENTAL
VALUATION:
PROCEDURES AND INSTITUTIONS FOR SOCIAL
VALUATIONS OF NATURAL CAPITALS IN
ENVIRONMENTAL CONSERVATION AND
SUSTAINABILITY POLICY
(VALSE)**

SUMMARY FINAL REPORT

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I. OBJECTIVES

The purpose of the VALSE research project has been to demonstrate effective methods for valuation of environmental amenities and natural capitals for conservation and sustainability policy purposes. The work programme, over the period June 1996 until May 1998, was defined with four main phases:

- Phase I was the translation of general principles for effective environmental valuation procedures that had been established from previous empirical and theoretical research and discussion, into a range of working hypotheses about key physical, institutional, and ethical factors in the social construction of environmental values.
- Phase II made the passage from methodological considerations to detailed research design and valuation practices appropriate for the specific features of each case study.
- Phase III saw the reverse movement, from the case studies back to wider methodological reflection, so as to formulate recommendations about valuation practices as components in environmental policy design and public expenditure evaluation programmes.
- Phase IV is the communication of the project results to policymakers, researchers, and the interested public. This is accomplished formally through workshops and symposia and a set of supporting written documents (including this report), and informally through the ways that knowledge of the VALSE research is absorbed into these communities.
- Valuation and choice have been approached "from the point of view of complexity" — that is, in a multi-dimensional perspective reflecting the variety of scales over which a problem may be considered and the range of individual and collective interests that may be involved:
- Individuals have specific interests in the environment as habitat, recreational space, cherished heritage, and space of economic opportunities;
- There are social and collective dimensions of choice reflecting both scientific and social properties of the choice situations;
- Scientific features of significance may include the indivisibility — that is, the collective character — of many environmental goods, services and hazards, the irreversibilities of environmental change, and the uncertainties of complex systems;
- People can express views individually and as participants in community, on dimensions of value relating to collective identity;
- Issues of fairness, justice and responsibility include considerations relating to the geographical and inter-temporal distributions of costs, risks and benefits, and extend to conflicts and compromises over what is just, right, and proper.

Value statements about the environment often emerge out of social processes of controversy and conflict. All choices, individual and collective, can be seen as value statements (implicit and explicit), but there is not a simple aggregation of preferences. Different social processes for environmental valuation will tend to elicit different evaluative responses. Valuation practices have a greater chance of social legitimacy and policy usefulness when they are implemented with awareness of these social and institutional dimensions of value formation.

The VALSE project has set out to demonstrate these contentions through the design and implementation of effective procedures for eliciting environmental valuation statements and for addressing the conflicts that arise, in four real situations of natural resource and environmental decision-making.

II. METHODOLOGY

VALSE is a project of research and demonstration of valuation procedures for policy. Through empirical studies combined with a permanent discussion of methodology, the team sought to design and demonstrate valuation techniques as components of real problem-solving processes appropriate to specific situations.

The Valse starting point was to seek to understand the ways that the concerned populations (or stakeholders) themselves express the "values" of environment. The scientific enquiries and analyses are thus validated partly by reference to "internal" norms of coherence and rigour and partly by reference to "external" considerations relating to the particular social (and ecological) context of the enquiry. When well-structured tools of analysis are employed in a process of enquiry, a two-way learning process is set up. The application of a chosen method of analysis structures the enquiry, and the researcher also learns about the reality through listening to what is said about the situation and about the research method itself from "other points of view".

Box 1 : The Valse Case Studies

- France: Social, ecological and economic valuation of forest pockets within farmland;
- Spain: Institutional and ecological factors determining changes in water quality and quantity management in the Canary Islands;
- Italy: Multiple criteria decision support analysis for identifying water resource use options for regional development in Troina, Sicily;
- United Kingdom: Economic and environmental values of proposed reconversion of agricultural land into wetland fen.

The Valse case studies have addressed situations of natural resource and systems management, notably water resources, forest and agricultural lands (see **Box 1**). The research process, in each case, aimed simultaneously at:

- Assessing (in monetary and non-monetary terms) the importance of the environmental "values" in question — that is, the nature of their actual or potential commitments for maintaining these values;
- Integrating these valuation statements within a real decision-making process.

This is what we mean by establishing social processes for environmental valuation.

The great variety of environmental evaluation perspectives and practices may, for the purposes of the Valse project, be considered along two axes.

- The variety in epistemological and normative stances concerning scientific knowledge and its purposes.
- The variety of different valuation techniques or "tools" that may be employed.

Concerning the nature of scientific knowledge and its purposes, we mention three contrasting perspectives, for convenience called Cartesian, Democratic and Complexity (**Box 2**).

The Cartesian perspective privileges a disciplined (and usually disciplinary) development of axiomatic foundations as a basis for obtaining theoretically organised knowledge about reality.

The Complexity perspective starts "in the middle of the road" with a willingness to work with several analytical perspectives simultaneously in a sort of permanent "conversation" seeking mutual understanding (even if not full reconciliation) across the many points of view.

The Democratic perspective asserts the goodness of decision making based on deliberation with free expression of individual views. In this regard it represents a normative challenge to the "one dollar, one vote" premise of cost-benefit analyses seeking to identify a "highest-value" (Pareto-efficient) resource use. Also, through its advocacy of public expression, debate and deliberation, the Democratic perspective makes claims about valid ways for generating and exchanging knowledge for arriving at satisfactory environmental decisions. So it is an epistemological as well as normative stance.

Box 2: Epistemological Stances

- The "Cartesian" perspective privileges "objective" description (leading to universal knowledge), and explanation based on axiomatic formulations of the categories for system description and behaviour;
- The "Democratic" perspective prioritises the status of each member of a social group to contribute to both knowledge and judgement (deliberation);
- The "Complexity" perspective is based on the postulate of an irreducible plurality of pertinent analytical perspectives for a situation of enquiry.

Box 3: Methods applied in the Case Studies

Each study had the components: ♦ Preliminary scoping study ♦ Detailed field research methodology and design ♦ Interviews with key social actors and people in the interested communities ♦ Implementation of a procedure which brought the social actors' views and preferences into an environmental decisionmaking or consultation process on the issue(s) in question.

The valuation tools applied in each case were:

- United Kingdom Wet Fens : contingent valuation (willingness to pay), citizens' jury;
- Canary Islands Water : diagnostic systems analysis, institutional analysis;
- France Rural Woodland : diagnostic systems analysis, discourse analysis, in-depth interviews, willingness-to accept survey;
- Sicily Water and Development: institutional analysis, multi-criteria analysis, in-depth interviews, attitudes and perceptions survey.

The case studies each centred around the implementation of a procedure that sought to bring actors' views and preferences into a process of environmental policy option evaluation or decisionmaking. The valuation tools applied in each case were as listed in **Box 3**. Consider the following remarks and examples:

- The method of Contingent Valuation (CVM) is widely presented as a way of revealing the preferences of the populations consulted, based on axiomatic assumptions of, *inter alia*, a full substitutability between money-valued goods and the non-monetised environmental services/goods in question. So we can locate CVM as conventionally understood, as a technique underpinned by a Cartesian epistemology. However, as the U.K. and France VALSE case studies demonstrate, it is possible to utilise survey techniques to solicit quantitative willingness-to-pay (WTP) or willingness-to-accept (WTA) information simultaneously with qualitative information permitting interpretation of motives and attitudes underlying people's WTP/WTA statements.

In the VALSE project, the U.K. wet fen WTP survey and the France woodland WTA enquiry have both been conducted "from the point of view of complexity" — that is, with a view to learning about motivations and attitudes rather than with a (conventional economic) view to trying to establish some numbers that can be fitted into a pre-conceived axiomatic framework such as utility theory with presuppositions of substitutability.

- A Citizens' Jury (CJ) is specifically designed to promote the possibilities for deliberation between members of a social group all having standing as individuals within a political unit. The Ely Citizens' Jury conducted as part of the U.K. wet fens study has been implemented as a demonstration of the effectiveness of deliberative processes underpinned by a Democratic value commitment to the public airing and debate of value statements from all members of the social group. This normative-methodological choice is one option within a perspective of Complexity.
- Institutional Analysis (IA) highlights patterns of political influence, control over access to water, who pays, who gets and who does not, what decisions about investment get made, by whom, etc.

In the Canary Islands, the water situation is scientifically and politically complex. From a neo-classical economic theory standpoint, current water resource use appears both inefficient and unsustainable. The wealth distribution is highly skewed, with short-term water extraction interests dominating. A "rational" water use reflecting opportunity costs (*viz.*, norms of allocative efficiency and sustainability) would require major political reforms. What would be an appropriate policy process to explore reform options? The country is formally a democracy, but many mechanisms for controlling water resources are covert and quite far from democratic values such as transparency of decision making and equal treatment of citizens. Democratic values cannot be deduced by a scientific analysis as being superior to dictatorship, free-market, or covert control. So specific normative premises are entailed when institutional analysis is used for a scientific elucidation of the (opaque) political-economic situation, so as to support informed public discussion. The approach admits Complexity while developing analyses in a *Democratic* epistemological and normative perspective.

- Methods of analysis such as open-ended interviews, linguistic evaluations in fuzzy-set multi-criteria analysis and hermeneutic discourse analyses (applied to documentary, institutional and interview material) admit Complexity in the sense of possible incommensurabilities between multiple perspectives.

A multi-criteria analysis combined with institutional analysis, in-depth interviews and survey was implemented to explore alternatives for action on a water resource problem with the Comune of Troina in Eastern Sicily. A decision problem that seemed both vague and intractable, with a mass of conflicting interests, has been

transformed through analyses and communication undertaken in a perspective of Complexity, into the beginnings of a purposeful community dialogue.

III. MAIN RESULTS

For a given valuation problem there are many feasible procedures for obtaining scientific and policy relevant information. This does not mean that all methods and perspectives are "equally good". Various tests of adequacy can be invoked. These include traditional scientific quality criteria such as internal coherence, falsifiability, ability to account for observed phenomena, fecundity for orienting research. They also include social considerations such as usefulness for conflict resolution or for a policy need, perceived relevance to stakeholders, compatibility with ethical convictions, etc. Judgements about pertinence and adequacy relate not just to the scientific quality (or defensibility) of the information obtained, but also to the roles that can be played by (or claimed for) different sorts of knowledge in the social and policy context. The VALSE project case studies have demonstrated how to implement environmental valuation studies in ways that fully reconcile scientific and political dimensions of a social science process.

III.1 The United Kingdom Agriculture — Wet Fens Valuation

The problem being considered was the justification (or not) for the re-construction of a now-rare ecosystem, that of wet fens. If approached in the perspective of a conventional environmental cost benefit analysis, the aim will be to identify "highest value" (viz., Pareto-optimal) levels of agricultural production, wetlands and any other resource use. This would mean comparing the costs of obtaining further wet fens, for example the loss of agricultural production, with the benefits of the enhanced environmental amenity obtained. Monetary valuation is sought so that the loss in relation to one objective can be quantified against the gain in relation to another.

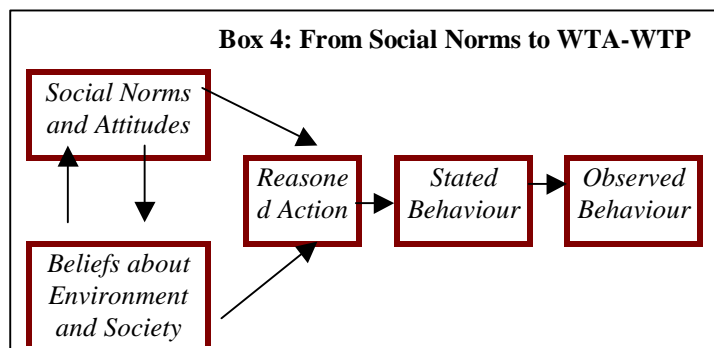
Contingent valuation (CVM) studies aim, in this sort of context, to obtain estimates of monetary values for environmental benefits and damages by asking individuals how much they would be willing to pay for a good/service or accept in compensation for its loss in a hypothetical situation of payment.

The framing hypothesis of the U.K. study was that different value articulating processes tend to elicit different values. These differences are not just quantitative (for example higher or lower money estimates) but also qualitative. In order to probe the character of contingent valuation and citizen's jury methods respectively as inputs to policy and decision-making, the research team implemented two parallel processes, a contingent valuation survey (CVM), and a citizen's jury (CJ), in which the merits of a 'live' project — a really existing proposal to restore wet fen habitat in East Anglia — were evaluated.

The Contingent Valuation Survey

The wet fens CVM study was designed so as to obtain quantitative information and also to highlight questions of motivations lying behind people's responses to questions about willingness-to-pay. The essential idea is that a CVM survey investigates "stated behaviour", but behind these statements there are a range of perceptions, social norms, beliefs and habits which will determine what is stated and what degree of acceptance a person will have of differing policy options (**Box 4**).

For the survey, the format of a trust fund was chosen to reflect the likely type of institutional arrangement which would arise from the really existing lobby group Wet Fens for the Future. This group is looking to create projects to achieve wetland restoration in The Fens, and is concerned to attract government and EC funding as well as private donations. The Wet Fens for the Future organisation provided a charitable body which could be referenced in the survey as the supporter of the trust in the same way that Royal Society for the Protection of Birds (RSPB) supports Wicken Fen.



The project being considered was an environmental improvement, and a willingness to pay question format was employed because any move towards an increase in wetlands in The Fens would require the purchase of farmland. The central question was left as an open-ended request:

"How much would you be willing to pay as a one-off contribution to the trust fund to help create wetland?"

The amount an individual is willing to pay to create an area of wetland is expected to vary according to their socio-economic characteristics. In addition, the study hypothesised that environmental attitudes and beliefs help explain the environmental values being expressed via contingent valuation surveys. Of the 713 individuals interviewed, 36 (about 5%) refused to answer the willingness to pay question and 182 (about 26%) were unable to answer responding "don't know". Some of the main findings are summarised in **Box 5**.

Box 5: Findings from the Wet Fens CVM Survey	
•	Individuals who voiced concern for the environment (an attitudinal variable) were prepared to pay significantly more for wetland creation.
•	Those who intend to visit the area in future bid a higher amount for wetland creation than those who have no such intention. This suggests that use values are significant for the wetland area concerned.
•	The results of the "rights" variables are also significant. First, individuals who perceive wildlife rights as inviolable are willing to pay significantly more than other groups for wetland creation. Second, there does appear to be an impact of the extent to which individuals qualify such rights by perceived "human economic needs". Different degrees of the acceptance of qualification appear to have markedly different impacts on the bid level. Ethical beliefs are significant determinants of the environmental values being found in contingent valuation.
•	Individuals in professional and managerial occupations are more likely to be willing to pay for wetland creation than other occupational groups. Women are also more likely to bid more than men, other factors held constant. Educational effects are also as expected with lower education being associated with lower bids.
•	The age and income variables did not play a major explanatory role.

The United Kingdom Ely Citizens' Jury

In July 1997 a citizens' jury was organised in Ely, near the East Anglia fens district. The Jury was supported by an Advisory Group made up of representatives of Cambridgeshire and Norfolk County Councils, the Countryside Commission, the Royal Society for the Protection of Birds, the National Farmers' Union, Silsoe College (part of Cranfield University), and local residents. The organisations represented on the Advisory Group, along with some others, all have an interest in proposals made in recent years to create more wetland areas in the Fens. Some of them have been involved in the umbrella 'Wet Fens for the Future' project; others would be affected by the proposals being made. The Jury was asked to discuss the following question:

"What priority, if any, should be given to the creation of wetlands in the Fens?"

16 jurors representing a cross-section of the population in the Fens and adjacent areas were recruited by a market research company, using house-to-house visits. The jurors were lay people with no particular prior expertise. They sat for four days, hearing evidence from a variety of expert and other witnesses, and discussing the issues surrounding wetland creation in small groups and in plenary session. The discussion was structured around options setting out different ways of creating wetland for different purposes. These options and the Jury's evaluation are summarised in **Box 6**.

Box 6 : The Ely Citizens' Jury Wet Fens Evaluations	
Policy Option	The Jury's Evaluation
Establish a Nature Reserve (as put forward by the Bedfordshire, Cambridgeshire and Northamptonshire Wildlife Trust)	Supported the proposal that a large wetland nature reserve be established which would protect rare species of flora and fauna and allow to (re-) introduce rare species, including mammals such as deer, wild horses, wild boar, beavers and otters — creating a 'semi-wilderness' area.

Incremental Development of wetlands (throughout the Fens through small-scale, farmer-led schemes)	Supported the argument that it was important to provide habitats for wildlife all over the Fens and not simply in separate sites. Significant efforts can be made by landowners with relatively small incentives.
Multi-use recreational Fen Centre (as set out by Norfolk College of Arts and Technology and others)	Not attracted by what the ‘superficial’, ‘theme park’ character of the proposal. Sceptical about the claims made for the Centre in terms of visitor numbers and created jobs.
No Deliberate Action	Unanimously rejected.
Establish Fens ‘Covent Garden’ (The Jury constructed for themselves this option, after discussion about the nature of agriculture in the Fens, employment problems, and food consumption and retailing patterns in society generally.)	The Jury suggested establishing a local wholesale centre to distribute fruit and vegetables produced in the Fens, a local ‘Covent Garden’. In this way, more of the added value in sales and distribution of Fens production could be retained in the Fens area. Local produce should be branded and marketed as such (for example as ‘Fen Food’). The job creation and economic development potential of such a centre may be significant.

The Citizens' Jury proved to be highly effective for investigating underlying value issues that divided and united different interest groups in the Fens communities. Detailed recommendations on coordination and financial incentives were made for the three options (that is, Nature Reserve, Incremental development and Fens covent Garden) considered to be desirable. Not only were the Jury participants themselves convinced of the value of their debates and recommendations, but also local politicians (councillors) became convinced of the value of the exercise.

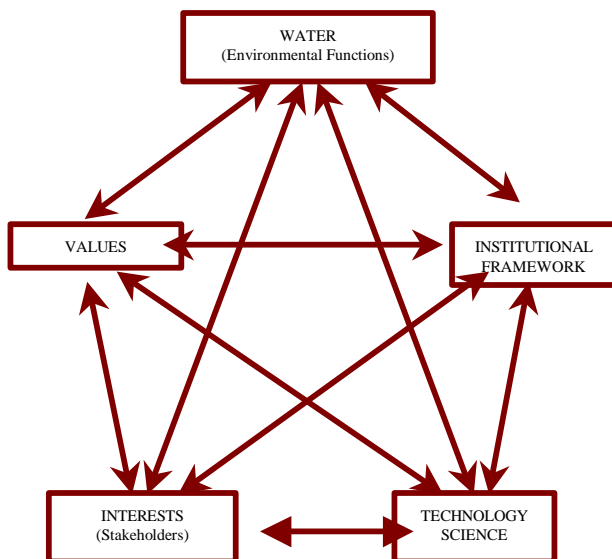
Comparative Remarks on the United Kingdom CVM and Citizens’ Jury Studies

The study demonstrated how CVM, centered around a technique of evaluation, and CJ, centered around a deliberative process, answer to different institutional needs, cultural roles and social contexts. In simple terms, these differences centre around :

- the contrasting role of the participant in each case - consumer as opposed to citizen
- the contrasting circumstance of the participant - separate individual as opposed to group member
- the contrasting attitudes which are elicited - preferences as opposed to values
- the contrasting nature of the participation - reaction as opposed to interaction
- the contrasting character of the process - calculation as opposed to deliberation

Policy making which is informed by awareness of these social and institutional dimensions of value formation will prove more robust in the long term.

Figure 1



III.2 The Canary Islands Institutional Analysis

Access to water resources in the Canary Islands has been a matter of conflict for centuries (Figure 1). An institutional analysis was carried out in order to account for recent changes in the notion of water (conflict between commodity and public good perspectives) and corresponding changes in the institutional framework. The following key elements of the social process and their interdependencies have been identified and studied : water (commodity) ; water (environmental functions) ; values ; stakeholders interests ; technology and science (eliciting uncertainty and ignorance) ; and, institutional framework.

The water valuation problem centres on conflicts between short-term economic interests and longer-term sustainability and social equity values.

Key decisions representing de facto valuation decisions have been made some years ago. In 1987 the Canarian government set up a new water law in an attempt to avoid the aquifer depletion by limiting to 15 years the rights for water withdrawal (with prospects of extension only if the aquifer is not damaged). Large water owners initiated a strong campaign against the government, pushing the idea that the government intention was to confiscate the rights without compensation. The campaign persuaded a large number of small water owners, and curtailed public debate. The new law was abolished and a new government was elected by promising a new law that "will respect the rights" for the next 75 years.

The valuation problem can be presented as a contest between two perspectives on the water issues, as in **Box 7**. At present, the Individual Interests perspective prevails. While formally the water is defined as a public good, in reality it is largely exploited as a private commodity. The aquifer is on a path of irreversible deterioration due to overexploitation and resulting marine intrusion. In the short run the existing institutional arrangement respects the dominant water owners' economic interests. But because of the worsening degradation, many water "owners" are, paradoxically, losing their not-very-well defined access rights. This aggravation of water scarcity results in pressure for new solutions. In the measures so far adopted, water management is posed as a technical question, such supply-side measures such as construction of new water distribution networks (pipelines and pumps, small dams, etc.), residual water treatment and re-use in agriculture, implementation of improved processes of brackish water desalinisation and sea-water desalination. These supply measures involve important public investments, though the benefits are very unevenly dispersed. (Moreover, aquifer deterioration is hastened by the brackish water desalination plants, because they promote increased extraction.)

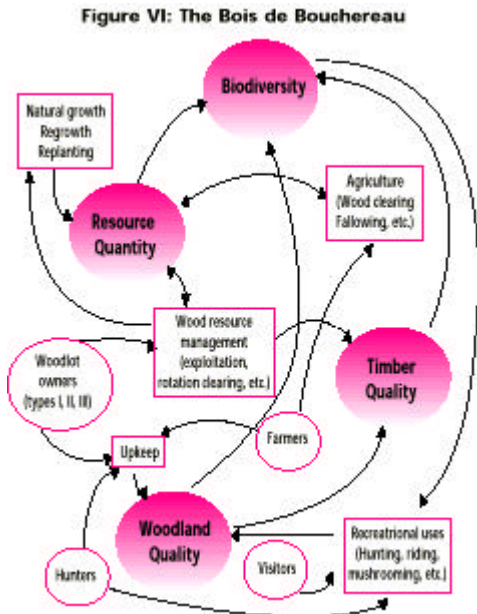
Box 7 : Two Perspectives on the Canary Islands Water Issue	
'Individual' Interests	'Social' Values
Water is a private good	Water is a public good
The water rights are unlimited and absolute	The rights are limited and derivatives
The owners have the capacity for self-regulating	The regulation should be exerted by the Government
There is not speculation	Speculation should be avoided
The water markets work properly	Water transactions are characterised by its opacity
Existence of transparency in the water distribution	Existence of fraud in the water distribution
The aquifer overexploitation has not been demonstrated from a scientific point of view	Overexploitation is evident in some islands and aquifers

Reform options can be appraised against three key norms — economic efficiency, sustainable use and democratic process (see **Box 8**). It is not logically excluded that all three could be pursued simultaneously, as a "first best" policy in a multi-criteria management of water use. But the present situation is very far away from this possible first-best. The analysis highlights key scientific, economic and political process issues that must be faced for durable solutions to be found. A more democratic social valuation *process* would probably be accompanied by a stronger visibility of "sustainability" and "social equity" values in the debates.

Box 8: Three Norms for Appraising Reform Options in Canary Islands Water Resource Use		
Allocative efficiency of resource use	Sustainable water resource use	Democracy:
Pareto-efficiency in water resource use implies that water be allocated to its "highest value uses" as defined by marginal costs and benefits. Because water resources allocation is determined by a complicated power-brokering system, some users have access at monetary costs per unit far lower than others. This is <i>prima facie</i> inefficient. It is also inequitable. A search for improved efficiency must confront obstacles	The Canaries aquifer water is a naturally renewable resource vulnerable to degradation. The drop in water table and marine intrusion are irreversible in that it may take longer to obtain "recovery" than it takes to degrade. Restrictions on water use so as to assure "sustainable use" are proposed by some sectors of the Canaries society, and are also required (legally) under norms set by the EC. Implementation of such	The present situation is one where a democratic process has been usurped by powerful economic interests. Reclaiming democratic values thus entails a contesting of the status quo. Democracy as the social and daily process of practicing and defending values such as freedom, justice, equity and rights of coexistence not dictated by willingness-to-pay

related to property rights. First, vested interests having de facto "rights" under the status quo will oppose changes reducing their opportunities. Second, efficient resource use is, in part, a function of the property rights that apply.	norms would confront the (re)distributional problems of, first, achieving reduction to total water use relative to the status quo and, second, deciding which social and economic interests) shall be provided for within constraints for sustainable use.	under status quo income distribution, involves a normative commitment. In this perspective the water valuation problem in the Canary Islands is largely a problem of political values and rights.
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III.3 Woodland in Rural France: From Market Price to Social Value



The Bois de Bouchereau is a small forest islet of about 50 hectares situated in an agricultural region, an open field country called the “Gâtinais Nord-Occidental”, about 100 km to the south-west of Paris. This forest is composed of “parcels” held as private property. The woodland has been, through different generations, progressively divided into (about) 284 woodlots, or parcels, actually owned by (about) 155 persons. It is an example of French “Ordinary Nature”, a natural space modified by human intervention over many centuries. No major conflict about the uses of the wood has appeared until now; the different uses as wood cutting, walking, hunting, daffodils gathering, and so on, coexist. The valuation question is one of understanding whether enough significance is attached to the forest to ensure that it will be sustained, and in what form.

In the first phase of the study, analyses were conducted that brought out the qualities of the forest socio-ecosystem as an indivisible “unité de valeur”. Based on both institutional and ecosystems analysis, a dynamic simulation model was developed that represents the evolving forest system through the interaction of human and ecological forces. The model expresses, as a sort of metaphor, the way that the forest is a sort of “social infrastructure”, described in terms of the variety of stakeholders (woodlot owners, adjacent farmers, hunters, visitors, and communal administrators) who contribute, and the variety of values attributed to the forest system.

The woodlots are transacted individually — mostly in the context of a hereditary transmission, sometimes as a local rearrangement (e.g., a neighbour seeks an adjacent plot, or a local person seeks a hunting terrain). The changes of ownership involve monetary transactions, administered through notary offices in the district. So there is a “price” for a woodlot when it changes hands, but is not really a “market for woodlots”. The variety of users and uses point to a high local significance of the woodland, associated mostly with the rural (village and agricultural) community life in the region. This high valuation is now “at risk” due to demographic and lifestyle change tendencies. Although ownership is transmitted mostly through hereditary transmission, the process of rural depopulation means a growing proportion of distant owners. The locally resident population is growing older; the majority of the farmers whose lands adjoin the forest are around 60 years old.

A survey was devised for an enquiry into actual and hypothetical market-like transactions (defined by a quantity and a price), and also an enquiry into the motivations for the actions — that is, the social norms,

customs, and individual beliefs — of the persons involved. The survey format combined specific data and quantitative information together with open-ended questions that would permit an "in-depth interview" to be developed. After an exhaustive telephone enquiry, a sample of 55 owners of woodlots (*parcelles*) in the forest was contacted and interviewed. The questionnaire was simple, and focussed on the price and other conditions under which existing proprietors might be willing-to-accept sale of their parcel (see **Box 9**).

The results reveal how the "price" of a woodlot is associated with a transaction whose significance is far more than a "simple market value". The parcels of forest are strongly perceived as elements of familial heritage, inherited from previous generations and passed on future generations. (This fact on its own explains the scarcity of sales.) The specific circumstances of each woodlot transaction (family transmission, consolidation of holding by local proprietors, departure of a family from the district) highlight the social relationships this community keeps up with and through this forest, reaffirming the social norms, individual and collective attitudes that sustain and constitute the value. In terms of some conventional categories of economic environmental valuation:

- There is economic "use value" of the wood as fuel (though many locals currently use electric home heating), and there is an economic value, to a lesser degree, for the wood as timber. Perhaps also there is a genuine economic and not just lifestyle value of the food items to be found in the forest (now of minor significance).
- The hunt may be said to be a "recreational value".
- The dimensions of "patrimony value" (sometimes called a "bequest value") and also of "aesthetic or landscape value" are clearly perceived. Owners of parcels living in the district take collective pride in the existence and maintenance of the forest. Ownership of parcels is an important factor of social identification for the community of inhabitants.
- By contrast, for the locals at least, this is not a question of "intrinsic value" such as the variety and robustness of species independent of human perception or utilisation.

For the most part, both the "use values" and the "non-use values" (notably bequest) are outside the market. These non-market values as well as the (mostly non-market) labours of woodlot tending and other maintenance are inseparable from the tissue of a customary way of life. The high value ascribed to the forest finds its basis in a culture of patrimonial meaning and investment. The parcels of forest are carriers of meaning — proudly inherited from the previous generations and, as such, destined to be passed on future generations.

III.4 The Troina (Sicily) Water Valuation Study

The water valuation problem for the Commune of Troina in Sicily was initially rather vague. On the one hand, there seemed to be a local assumption of an actual water shortage in Troina, which could perhaps be remedied by more effective use of existing resources or by changing use priorities. It turned out that, although real water shortage is common in Sicily, Troina is exception. On the other hand, there is a complex and heterogeneous collection of interests in the Troina water issue, who up until now have had no effective dialogue.

Box 10 : Scenario Options for Future Use of Troina Water Resources

- "Mineral Water" — To use some spring water sources located in the forest to produce bottled mineral water. At the moment, this water flows free in the forest, so bottling it creates no new water use conflict. The symbolic value for the community may be very big (a bottled Troina water might convey a re-appropriation of local natural resources).
- "Mineral Water plus Recreation" — To combine mineral water with some recreational activities in the forest. These recreational activities are connected with restoration of existing country houses, which are property of the "Comune", e.g., to open a small hotel or a restaurant in the wood, encouraging the re-appropriation by "troinesi" of the forest.
- "Information Campaign" — To develop a massive information campaign about local water resources (water cycle, water process, technological uses of water, water management, water distribution, ...).
- "Galli Law" — The Galli framework law concerns the basin authority, to be implemented by the central government. In Sicily water is "a reserved topic" of the regional government, which means difficulties in implementation of the law.

- "Self-sufficiency" — Self-sufficiency of Troina drinking water needs is a major short-term goal of the town administration in its water policy.
- "Compensation" — Compensation to Troina (for the fact that water is appropriated outside the community).
- "Changes to Irrigation" — Investments in the water irrigation structure in Catania (pipelines, etc.) could improve the efficiency of the water use by Catania farmers, thus saving more water for Troina.

The primary research task was to achieve an effective structuring of the water problem, so that negotiations among stakeholders could have a better chance of a positive outcome. A set of options, summarised in **Box 10**, was identified having a short/medium temporal scale, relatively low costs and a good prospect of being absorbed by the Troina community. For the evaluation of these options, several analytical methods were employed in a complementary way, as summarised in the Figure 3.

On the basis of an initial institutional analysis, it was chosen to start the construction of the multi-criteria analysis framework with the identification of the affected interest groups. By considering appropriate criteria and alternatives, it was then possible to take into account the conflicting preferences of these groups. The impact scores can be determined, such that an evaluation (or impact) matrix can be constructed. Then these scores are analysed by applying discrete multi-criteria techniques. Applying the method of *NAIADE* to the multicriteria impact matrix, a ranking of policy options was obtained. In terms of this ranking and the adjacent conflict analysis, three options warrant particular attention:

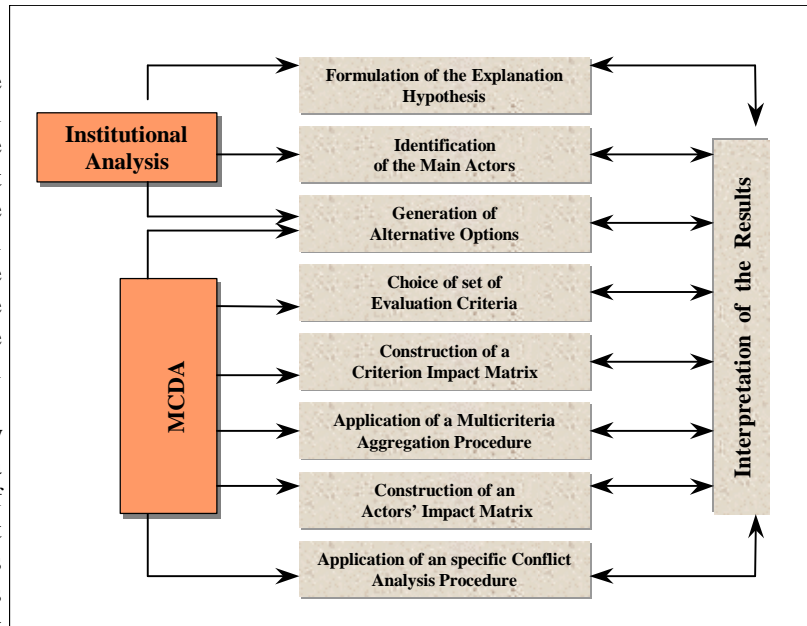


Figure 3
N.B. MCDA Multi-Criteria Decision Aid

- The Business as Usual (do nothing) option was ranked near the bottom. This raises the question, why has there been little push for change up until now? In fact, the institutional analysis and interviews suggest that the status quo is a "stand-off" type compromise situation between the divergent interests. It is a situation of impasse rather than concerted choice or optimisation
- The Mineral water plus recreation (Option C) has been identified as a good positive compromise. First, it represents a feasible local development and use of the water resources. Second, it is the only option of change of the status quo that does not meet strong opposition (except from some environmentalists, which can perhaps be resolved or diminished). It is "defensible" from the multicriteria analysis point of view, even though not at the top of priorities (it was fourth in the final ranking), because it is widely judged as preferable to business as usual.
- The Information Campaign option emerged, after starting as a fuzzy idea, at the top of the multi-criteria ranking. The Mayor and the municipal administration judge that the implementation cost of such a policy measure is quite low and the positive impacts on the community could be very high (the municipality is, indeed, already developing plans for an exposition on water management issues in the town of Troina.) Although the political risks for the administration might also be high, one of the perceived benefits is indeed the increased awareness within the Troina community of the conflicts to be resolved about future water use and distribution of benefits.

The multi-criteria evaluation techniques do not solve the conflicts or uncertainties about Troina water use options. Rather, they help to provide insight into the nature of conflicts and into ways of exploring policy compromises (or policy solutions that could have a higher degree of equity on different income groups). Given

the contrasting interests, this is a situation where the decision maker (the “Troina Comune”) has to decide whose interests have priority; no escape from value judgements is possible. It is remarkable that the Troina community has very quickly “internalised” the notion of evaluation tools as vehicles for developing public discussion and policy debate. They have already gone beyond the idea of multi-criteria evaluation as a mechanical process of ranking, and have integrated the study perspectives and results within their own political process.

IV. SCIENTIFIC INTEREST

Within the four VALSE case studies, various valuation methods have been applied, and themselves evaluated, from the points of view of contrasting knowledge perspectives and the normative significance attached to the knowledge sought or gained. In this way, the project VALSE demonstrates a reflexive social science epistemology and methodology for evaluating the pertinence and performance of various environmental valuation methods. The project has been developed through specific case studies, and there is no general model being put forward for universal applicability in analytical valuation research design. Rather, a series of methodological reflections, with supporting empirical examples, are offered as guidelines to effective procedures for clarifying the dimensions of choice for renewable natural capital management problems. Some of the general findings that emerge of most importance and wide applicability are:

Limits on Transferability: One important theme in policy analysis and in the academic valuation literature is transferability — or not — of valuation results and of experience with methods, from one situation to another. The VALSE experience suggests that analytical tools are best to be considered as “aids” in a social process of defining problems and considering possible solutions, but that neither quantitative results nor implementations of analytical methods should be regarded as easily transferable. Relevant to any social process of environmental valuation there are “internal” scientific criteria of validation appropriate for each tool and conceptual framework of enquiry, and there are also the “external” social context considerations such as the political and cultural circumstances of the enquiry. These internal and external dimensions cannot be held completely apart from each other, because ethical, cultural and political convictions, along with economic interests, can actually bear on conceptions of science itself — and at any rate will have some bearing on perceptions of the adequacy of a particular scientific or social scientific method for addressing the various ecological, social and economic dimensions of a problem.

Discovery versus Construction of Value(s): Another debate in the academic literature concerns whether environmental values are being “discovered” or “constructed” through valuation research enquiries. For example it is often suggested that the purpose of CVM studies is to reveal something about preferences as measured by the money–object or money–service tradeoffs that — hypothetically — individuals would be willing to make. The preferences are considered to be pre-existing but unknown, and the emphasis is on an instrument of enquiry that can reveal them. Other researchers emphasise ways that the social conditions and instruments of enquiry can themselves influence people's perceptions and the terms in which they consider an environmental issue. In this view, people's preferences are not ‘given’ or wholly pre-existing, rather attitudes and valuation statements emerge and may be transformed within an evolving social process including new conventions for conflict resolution within which use of scientific valuation instruments is a contingent part. The VALSE case studies show clearly that all procedures for eliciting value statements involve simultaneously both discovery and construction.

Valuation as a Social Science Process: The VALSE project has designed and demonstrated valuation research as a process of both discovery and social action. For all the parties involved the research can contribute to both learning and social change. As such, any research process will have different sorts of significance for the various stakeholders involved — including the “researched” as well as the researchers, the “decision receivers” as well as the policy advisors and formal decision makers. A choice of method and of the way in which analytical valuation “tools” will be applied, is not a purely scientific affair, it is also necessarily an action charged with social, cultural, political meaning. (This is illustrated in the VALSE studies for the cases of: surveys of WTA or WTP, Citizens' Jury, Multi-Criteria Decision Aid, and Institutional Analyses.)

Variety in Justification Orders: Through the VALSE case studies it has been illustrated that just as projects and policies can be evaluated according to more than one criterion, so people's statements about the importance of their environment can, depending on circumstances, make reference to a variety of principles or belief

systems. These empirical findings demonstrate an important methodological proposition, the idea of characterising the different types of concerns expressed by the social actors in a valuation situation and relating them to basic "legitimacy orders" within the societies under observation. Both the scientific quality and the policy relevance of a valuation study depend on the ability of the researchers to situate themselves intelligently in relation to the (often conflicting) forms of legitimation invoked or potentially invoked in the situation.

V. POLICY RELEVANCE

In the project VALSE, the researchers in each case study are understood as "actors" within a wider social process. This defines "policy relevance" of such research in a sense that is both immediate and potentially far-reaching sense. The forms of these immediate and wider contributions to the policy process depend on several factors, of which we mention three: social and ecological scale of the problem, degree and nature of conflict, and the social role(s) of 'agency' ascribed to the researchers. We illustrate from the case studies:

Scale: Water resources management in the Canary Islands is critical for the population of several hundred thousand people, and has repercussions for public policy of mainland Spain. Lessons drawn for the Canaries may have visibility throughout water-scarce zones the Mediterranean region. This contrasts with the rather diffuse initial nature of the Troina water resources management problem, and the extremely local nature of the French Bois de Bouchereau. Yet all studies reveal linkages across different geographical and political scales. The woodland study in France yields insights into demographic and economic trends of rural/agricultural France which are inseparable from large-scale questions of European agricultural and environmental policy (notably reforms to the Common Agricultural Policy), and the same linkage is evident in the East Anglia wet fens study where agricultural policy was explicitly a dimension of discussion.

Conflict: The case of the woodland in rural France is marked by fairly high local consensus on the "value" of the forest. There are local disagreements over specific woodlots or management actions, but the situation overall is one of not enough "interest" to ensure future sustaining of the value. The water resources situation in the Canaries is, by contrast, marked by explicit political and economic conflicts the terms of which have deeply stratified the island populations. The tensions are so strong that open discussion of the issues is difficult. The cases of Troina water futures and East Anglia wet fens are intermediate. Differences of interests have been clearly identifiable but it has proven possible — partly through the valuation studies themselves — to have exchanges of views and to build procedures of stakeholder negotiation.

Agency of the researchers: The case studies may be compared and contrasted in terms of the roles played, or potentially played, by the researchers in the wider social-political process. This is not just a matter of the researchers' own choice, but depends largely on perceived possibilities of alliances and the decision stakes.

- In the U.K. case, the question of agricultural versus wet fens has an important local reality with possible "litmus test" importance on a larger scale. The researchers were recognised to have a legitimate role not only for improving the information base but also in the process of public debate; this multiple role was epitomised in (but not limited to) the Ely Citizens' Jury.
- In the France Bois de Bouchereau case there were not any "crisis" decision stakes; the researchers could pursue peacefully the social scientific question of understanding the socio-economic basis of the woodland value. Yet, it was necessary to develop the enquiry with respect for the sensitivities of the host community (e.g., through tactful initial contacts with local leaders and polite conduct throughout). Once a respectful interest was expressed in the local community and their forest, the researchers were (despite having no prior links with the locality) solicited as potential friends or allies in the sustaining of the local values. This is, of course, quite coherent with the proud tradition of patrimonial values.
- In the Troina water study, the question of prospects for the future is a major matter of community concern. In this situation of a deep but diffuse concern, the options for research design were rather wide. The researchers were confronted by the necessity to make explicit the key social, ecological and economic dimensions of the water valuation problem that were partly implicit in the established management structures (electricity, irrigation); it was also desirable to maximise the perceived benefit of the research to the local community. The needed problem clarification was made possible because the researchers were accepted as "partners" within the local community. This cooperation (notably with the Troina

municipality) gave the researchers an "entrée" to the local scene and also established a dimension of legitimacy and pertinence for the study. The high perceived pertinence was preserved because, as it turned out, the methods of analysis and implementation were successfully formulated in ways that were congruent with the local culture. The Troina water valuation research became accepted locally as a positive contribution to the community, leading directly to the initiation of a water public information campaign and the beginnings of a structured stakeholder negotiation process to consider future water management options.

- In the Canary Islands case, the political situation concerning water is highly polarised which means that any expression of opinion or scientific judgement is considered as a political act. Economic and political stakes are high, and there is no such thing as a "disinterested" scientific enquiry in such a situation. Inevitably the valuation analysis starts with an institutional analysis, and finishes with explicit observations about the significance of the research process itself within the conflictual political process.

The case studies have all offered opportunities to evaluate the hopes that might be placed in particular methods or tools as a means of obtaining information on the values that concerned individuals and populations attach to features of their environments. In this way, the ambitions, limitations, justifications and weaknesses of differing perspectives and practices of evaluation have themselves been reflexively presented and appraised. More particularly, the political as well as scientific significance of methodological choices has been brought into focus, showing how method choice, implementation and communication of results can — and should — all be made elements of deliberation within wider social process.

VI. PUBLICATIONS

The VALSE project is reported partly through fulfilment of contractual undertakings to the European Commission and partly through a variety of freely undertaken processes of publication and dissemination of research reports, scientific papers, popular contributions and book contributions. The official research documentation has been produced in the following form:

Martin O'CONNOR (1998), *Walking in the Garden(s) of Babylon: An Overview of the VALSE Project*, C3ED Rapport de Recherche, July 1998 (published edition forthcoming).

Martin O'CONNOR (editor, 1998), *Social Processes for Environmental Valuation: The VALSE Project*, Full Final Report to the DG-XII, European Commission, under contract ENV4-CT96-0226, C3ED Rapport de Recherche, September 1998.

Martin O'CONNOR (1998), *Social Processes for Environmental Valuation: The VALSE Project*, Summary Final Report to the DG-XII, European Commission, under contract ENV4-CT96-0226, C3ED Rapport de Recherche, July 1998.

VALSE: Valuation for Sustainable Environments, Brochure Presentation, produced by the C3ED, Paris, September 1998.

VALSE: Valuation for Sustainable Environments, Web-site Presentation, produced by ISIS, JRC in cooperation with the C3ED, Paris. Available in September 1998.

The variety of VALSE-related research reports, papers and publications, including those in advanced stages of preparation or actually (July 1998) in press, are listed in the pages following, under the requisite categories: (a) Books; (b) Contributions in books; (c) Articles in scientific journals; (d) Other. In order to achieve completeness, there is inevitably some redundancy (e.g., reporting of a Workshop or Conference paper presentation, and also reporting of a book or journal publication for that paper's revised version....).

(a) Books

in preparation

O'Connor, M. (Editor, forthcoming 1999) *Environmental Evaluation*, Volume 1 in the International Library of Ecological Economics (ILEE Series). Edward Elgar, Cheltenham.

in press

Aguilera Klink, F., E. Pérez Moriana and J. Sánchez García (forthcoming 1999) *Valoración ambiental del agua en Canarias*, Colección Nueva Cultura del Agua. Editorial Bakeaz. Bilbao. España.

published

O'Connor, M. and C. Spash (Editors, 1998) *Valuation and the Environment: Theory, Methods and Practice*. Edward Elgar, Cheltenham.

**(b) Contributions to books
in preparation**

The following papers produced within the VALSE work programme are forthcoming as contributions in: O'Connor M. (Ed., 1999) *Environmental Evaluation*, Volume 1 in the ILEE series (International Library of Ecological Economics). Edward Elgar Publishing, Cheltenham, UK/Northampton, MA, USA.

Funtowicz, S., S. Lo Cascio and G. Munda "The Troina perceived water issue: a multicriteria evaluation process", draft presented in the European Symposium on Environmental Valuation, Domaine des Vaux de Cernay, France (1997).

Godard, O. and Y. Laurans "Environmental valuation as social co-ordination devices within controversial contexts", presented at European Symposium on Environmental Valuation, Vaux de Cernay, France (1997).

Spash, C. "Contingent Markets as a Research Method into Environmental Values and Psychology".

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Jacobs, M. (forthcoming) "Sustainable Development as a Contested Concept", in A. Dobson (Ed.) *Fairness and Futurity*. Oxford University Press, Oxford.

Martinez-Alier, J., G. Munda and J. O'Neill (forthcoming 1998) "Commensurability and Compensability in ecological economics", Chapter 2 in M. O'Connor and C. Spash (Eds) *Valuation and the Environment: theory, method and practice*. Edward Elgar, Cheltenham.

Spash, C. (forthcoming 1999) "Reflections Upon the Role of Moral Sentiments in Economics" in J. Köhn (Ed) *Managing Sustainability: European Perspectives and Experience*. Edward Elgar Publishing Ltd, Cheltenham, UK/Northampton, MA, USA.

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O'Connor, M. (1997) "Reconciling Economy with Ecology: Environmental Valuation from the Point of View of Sustainability" in K. Aarts, P. Boorsma and A. Steenge (Eds.), *Setting Priorities*. Kluwer, Dordrecht.

O'Neill, J. (1997) "Value Pluralism, Incommensurability and Institutions" in J. Foster (Ed) *Valuing Nature? Economics, Ethics and Environment*. Routledge, London.

Spash, C. (1998a) "Investigating individual motives for environmental action: lexicographic preferences, beliefs and attitudes", pp.46-62 in J. Lemons, L. Westra and R. Goodland (Eds) *Ecological Sustainability and Integrity: Concepts and Approaches*. Kluwer Academic Publishers.

Spash, C. and J. Aldred (1998) "Wildlife conservation" in *Encyclopaedia of Applied Ethics*. San Diego: Academic Press Inc.

Spash, C. (1997c) "Environmental management without environmental valuation?", pp.170-185, Chapter 11, in J. Foster (Ed) *Valuing Nature? Economics, Ethics and Environment*. Routledge, London.

**(c) Articles in scientific journals
in preparation**

- Forthcoming (appearing 1999) in *Ecological Economics: Special Issue* (coordinated by M. O'Connor), on the theme: "Social Processes for Environmental Valuation". Provisional List of Contents:
Aguilera Klink, F., E. Pérez Moriana and J. Sánchez García "Social Processes for Environmental Valuation. The Case of Water in Tenerife (Canary Islands)".
- Darier, E., J. Foster, R. Grove-White, A. Holland, J. O'Neill, B. Szerszynski and B. Wynne (1999) "New Deliberative Institutions and Environmental Decisionmaking".
- De Marchi, B., S. Funtowicz, S. Lo Cascio and G. Munda (1999) "Combining Participative and Institutional Approaches with Multicriteria Evaluation. An Empirical Study for Water Issues in Troina, Sicily".
- Jacobs, M. and J. Aldred (1999) "Citizens and Wetlands: Evaluating the Ely Citizens' Jury".
- Laurens, Y. and O. Godard (1999) "Valuation Processes as Tests of Legitimacy in a Plurality of Legitimacy Orders: Applications to Water Resources in France".
- Noël, J-F., M. O'Connor and J. Tsang-King-Sang (1999) "The Bouchereau Woodland: From Market Price to Embodied Social Value".
- O'Connor, M. (1999) "Pathways for Environmental Evaluation: A Walk in the (Hanging) Gardens of Babylon".
- Spash, C. (1999) "Ecosystems, Contingent Valuation and Ethics: the Case of Wetland Recreation".

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- Aguilera Klink, F., E. Pérez Moriana and J. Sánchez García (forthcoming 1999) "Environmental Valuation of Groundwater in an Island Context. The Case of Tenerife (Canary Islands)", *International Journal of Environment and Pollution*, 12, Special issue on Valuing Natural Systems.
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