Ministerie van Verkeer en Waterstaat

The Citizens' Perspective in a socio-economic evaluation?

A quick scan of the current state of affairs

In het kader van "Comcoast, Workpackage 2"
Socio-economic evaluation from the citizens' perspective

March 2005

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Summary

ComCoast - 'COMbined functions in COASTal defence zones' - is a European project which develops and presents innovative solutions for flood protection in coastal areas.

The ComCoast concept aims to create coastal defence strategies without raising flood barriers: as well as strengthening the inner slope of the coastal defences, the hinterland areas will be reallocated in an attractive and innovative way to cope with the temporary storage of excess flood waters.

The objectives of the ComCoast project are six-fold:

1. To explore the spatial potentials for wider flood defence zones for current and future sites in the 'North Sea Interreg IIIb' region;
2. To create and apply new methodologies to evaluate multifunctional flood defence zones from a socio-economic perspective;
3. To develop a variety of innovative technical solutions to make dikes resistant to wave overtopping to guarantee the required safety level;
4. To improve and apply strategies to involve all interested parties in the projects, with the primary emphasis on securing participatory action from the general public;
5. To apply best practice multifunctional flood management solutions to the ComCoast pilot sites;
6. To share and disseminate knowledge across the 'Interreg IIIb North Sea' region.

These sub objectives have been translated into six work packages. This memo is part of the second work package (WP2). The ultimate aim of this package is to make the socio-economic effects of the ComCoast concept tangible. This necessitates the development of a socio-economic evaluation that can be applied to the ComCoast concept and, where possible, to conduct this evaluation for one or more pilot project(s). In the Netherlands, it has been decided to evaluate the socio-economic aspects of the ComCoast approach partly from the citizens' perspective (experiential value).

The problem formulation of this quick scan is twofold:

Is it possible to fully incorporate the citizens' perspective (for example in the form of experiential value) in a socio-economic evaluation? And does it serve a useful purpose?

In this context, the concept of ‘the citizen’ denotes the user of the (project) site, including neighbouring residents, other authorities, companies and interest groups. There are a variety of methods for incorporating the citizens' perspective into an impact assessment. We can make a distinction for instance between interactive incorporation or open plan process, or substantive incorporation, i.e. via a research-based evaluation.

To address the problem formulation, a number of key economic evaluation methods will be highlighted first, before concentrating on the methods used to measure experiential value - a substantive approach to defining the citizens' perspective. Lastly, an attempt will be made to set out the practical aspects of the citizens' perspective in a socio-economic evaluation.

Economic evaluation methods

In the Netherlands, two important evaluation methods have been identified to conduct a socio-economic evaluation: the Social Cost-Benefit Analysis (SCBA) and the Multi Criteria Analysis (MCA).

Social Cost-Benefit Analysis

An SCBA is effectively a systematic inventory of all positive and negative effects and impacts of a particular project or policy measure. If the project or policy measure secures a net positive balance in terms of costs and benefits, it can be concluded that the project makes a significant contribution to societal welfare.

The Cost Effectiveness Analysis (CEA) is a special form of SCBA. A CEA compares the cost (usually operational) and effect variables (usually benefits) of alternative policy options. Unlike the SCBA, the CEA presupposes that there is no substantial difference between the alternatives in terms of their costs or effect variables.

The SCBA is primarily conducted on the basis of market values. If no - or no well-functioning - markets are available to conduct a cost-benefit analysis, other monetary valuation methods will be used. The following monetary valuation techniques are typically used in an SCBA:

1. the Production Function Approach;
2. the Preventative Expenditure Technique;
3. the Hedonic Pricing Method;
4. the Travel Cost Method;
5. the Contingent Valuation Method;
6. the Conjunctive Measurement Method;
7. the Welfare Valuation Technique;
8. Allocation Games.

Multi Criteria Analysis

The Multi Criteria Analysis (MCA) technique is used to test and prioritise alternatives against a variety of criteria. The degree to which one alternative achieves a higher score in e.g. economic profit must be weighed up against the more environmentally friendly results of another alternative.

Multi-criteria problems have a number of notable characteristics:

- multiple objectives and/or criteria;

- conflicting criteria, for example market share versus profit, comfort of a car versus fuel consumption, or the negative impact of a rise in water levels for farmers versus positive impact on the landscape;
- the criteria are measured in non-comparable (on occasion qualitative) units.

The decision maker needs to make a number of MCA-specific choices, including:

1. Determining the criteria;
2. Determining the scores per criterion;
3. Weighting the criteria; and
4. Prioritising the alternatives (outcome of steps 2 and 3).

Measuring experiential value

The term ‘experiential value’ denotes a set of environmental characteristics deemed important by citizens. In this respect, an environmental characteristic is a tangible feature of the living environment. This could be a physical, social, economic or environmental feature.

In the Netherlands, there are four distinct methods for measuring experiential value within planning projects:

1. SPEL - Landscape Perception and Evaluation method [Dutch: Schalen voor Perceptie en Evaluatie van het Landschap];
2. Op en in de weg;
3. Experiential value survey;
4. Liveability impact report.

Evaluation methods and citizens' perspective

There is little consensus among experts on the feasibility of applying the citizens' perspective into an evaluation method. In this study, the 'battle of the methods' regarding the monetarisation of experiential value has been left out of the equation for the foreseeable future.

The benefits of incorporating a citizens' perspective into a socio-economic evaluation are three-fold:

1. Citizens bring site-specific knowledge and expertise to the analysis;
2. This ensures that the focus is not only on welfare, traditionally the key aim of an SCBA, but also on wellbeing;
3. The results have a broader support base (less risk of encountering objections).

On the basis of literature reviews, expert meetings and consultations, four methods have been identified that have the potential to set out the practical aspects of the citizens' perspective within the evaluation framework:

1. Monetarising experiential value in an SCBA. From the initial phase of the SCBA - the problem analysis phase - experiential value must be accommodated among the other values and carefully defined and structured;
2. Measuring experiential value in an MCA;
3. The Economic-Ecological-Emotional method;
4. Interactive structuring of the entire SCBA process in consultation with the general public.

The last paragraph includes some practical examples of these four potentially successful methods.

Conclusions

Integrating the citizens' perspective as a credible component of a socio-economic evaluation is both a feasible and meaningful activity. Examples include the Multi Criteria Analysis, which typically embraces experiential value as a credible component, or the Economic-Ecological-Emotional method, which plots out economic, ecological and social assessments.

Ideally, impact assessments such as MCA or the Economic-Ecological-Emotional method should be carried out interactively in consultation with the general public. This not only strengthens the support base of the project in which the assessment is being conducted, but also the support base of the results of the assessment itself. Consequently, the local knowledge used in the impact assessment is safeguarded.

The citizens' perspective can also be incorporated in an SCBA. There is however very little consensuses among experts as to whether this serves a practical purpose. Moreover, the feasibility of monetarising the citizens' perspective is a hotly contested issue in the 'battle of the methods'. In a nutshell, proponents believe that monetarisation is the only viable method for adding credibility to the citizens' perspective; provided it is measured properly and accurately. Opponents raise substantial methodological objections and also refute the usefulness, as they believe (among other things) that politicians themselves are responsible for incorporating the citizens' perspective.

Introduction

This chapter describes the background to this literature review. In addition, the problems and aims are broadly outlined, and the structure of this report explained.

1.1 Background

ComCoast - 'COMbined functions in COASTal defence zones' - is a European project which develops and presents innovative solutions for flood protection in coastal areas.

Over the next decades, climate change will place increasing physical demands on the flood defences along the North Sea.
Sea levels are rising while ground levels are falling, causing salt-water intrusion into the coastal areas. Traditional flood management techniques involved raising dikes to protect the inner slopes (typically grass) from wave overtopping. Alternative solutions must be sought, without the need to raise the dikes. ComCoast is exploring new methods to secure a gradual transition from sea to land in wide coastal defence zones. These transitional areas will create new opportunities for the environment and the local population, and offer a sustainable solution to anticipate future developments.

The ComCoast concept aims to develop multi-functional coastal flood management schemes with a more gradual transition from sea to land, which benefit the wider coastal community and the environment and which are economically viable.

The concept focuses firstly on embankments:

- To provide economical and sustainable alternatives to the traditional flood defence strategy of raising the crest level of the embankments step by step;
- To create a win-win situation for water management across a wider coastal zone and multi-functional land use, and;
- To find solutions for spatial development needs in the coastal zone.

The objectives of the ComCoast project are six-fold:

1. To explore the spatial potentials for wider flood defence zones for current and future sites in the 'North Sea Interreg IIIb' region;
2. To create and apply new methodologies to evaluate multifunctional flood defence zones from a socio-economic perspective;
3. To develop a variety of innovative technical solutions to make dikes resistant to wave overtopping to guarantee the required safety level;
4. To improve and apply strategies to involve all interested parties in the projects, with the primary emphasis on securing participatory action from the general public;
5. To apply best practice multifunctional flood management solutions to the ComCoast pilot sites;

6. To share and disseminate knowledge across the 'Interreg IIIb North Sea' region.

These sub objectives have been translated into six work packages:

1. Spatial application options;
2. Socio-economic evaluation;
3. Technical elaboration of the concept;
4. Interactive planning;
5. Pilot projects;
6. Overall project management and knowledge dissemination.

This memo is part of the second work package (WP2). The ultimate aim of this package is to make the socio-economic effects and impacts of the ComCoast concept tangible. This necessitates the development of a socio-economic evaluation that can be applied to the ComCoast concept and, where possible, to conduct this evaluation for one or more pilot project(s). The object of the concept is to compare a ComCoast solution on the basis of socio-economic criteria with a so-called null alternative (the situation of an autonomous development) and other alternatives (for example dike strengthening).

To avoid reinventing the wheel, a quick scan is conducted at the start of each work package to assess the current state of affairs. For work package 2, this comprises of a preliminary study, the results of which are presented in this memo. The memo is intended for internal use within the ComCoast project, and is aimed in particular at WP2 experts.

The preliminary study consists of a number of phases:

0. Preparatory work and drawing up project plan.
1. A brief Internet search (and via word-of-mouth) to gain an initial insight into the current state of affairs in the Netherlands with regard to economic impact analyses, including SCBA (and the key players in this respect). The primary focus of attention will be on economic analyses in the North Sea region.
   - ➔ Result: a number of economic impact studies and a list of people / organisations responsible for conducting these studies.
2. Desk research of found documents.
   - ➔ Result: memo re. current state of affairs in literature.
3. Interviews with a number of key people (two or three) with regard to the economic evaluation of the effects and impacts on the methodology in general and the implementation of a socio-economic evaluation from the citizens' perspective (experiential value) in particular.
   - ➔ Result: interview reports.
4. Expert meeting (involving 8 to 10 experts) in the fields of economic impact studies and experiential value relating to a socio-economic evaluation from the citizens' perspective.
   - ➔ Result: management summary results expert meeting.
5. Collating and analysing all results and drawing up conclusions.

This memo is the result of a concise literature review into current socio-economic evaluations. A brief study was conducted into examples of situations where societal aspects were incorporated into an economic impact study, or an attempt was made to incorporate societal aspects. The interviews and the expert meeting provided a vital input into this memo.

The result is primarily aimed at the benefits and the possibilities of conducting a socio-economic evaluation from the citizens' perspective. Lastly, the quick scan initiates the development of a design to structure the socio-economic evaluation from the citizens' perspective.

1.2 Problem formulation

Typically, an evaluation framework is drawn up prior to the commencement of a project. This process involves determining criteria to evaluate the effects and impacts of different alternatives. On the basis of this impact assessment and the relative importance assigned to a particular criterion, the alternative project options can be weighed up.

A number of effective evaluation methods have been identified to compare and evaluate the effects and impacts on a variety of criteria. In the Netherlands, the preferred evaluation methods are the Social Cost-Benefit Analysis (SCBA) and the Multi Criteria Analysis (MCA).

These evaluation methods encompass a range of valuation methods to calculate or estimate the effect or impact of a particular intervention according to a defined criterion.

Experience or experiential value is not a fixed component at this stage. There is little or no consensus among experts on the feasibility of incorporating experiential value in the evaluation methods, or indeed whether the inclusion of experiential value serves a useful purpose.

The problem formulation of this study is two-pronged:

Is it possible to incorporate the citizens' perspective (for example in the form of experiential value) as a credible component of an economic impact study? If so, does this serve a useful purpose?

In this context, the concept of ‘the citizen’ denotes the user of the (project) site as well as neighbouring residents, other authorities, companies and interest groups. There are a variety of methods for incorporating the citizens' perspective into an economic impact study. We can make a distinction for instance between interactive incorporation or open plan process, or substantive incorporation, i.e. via a research-based evaluation.

One way in which to ***substantively*** incorporate the citizens' perspective in an economic impact study is to measure the experiential value. There are numerous valuation methods to measure or estimate experiential value, just like there are numerous valuation methods to arrive at an end result. The Civil Engineering Division for example has many years' experience of drawing up, conducting and implementing experiential value surveys as part of planning studies.

The object of the preliminary study is to gain an overall impression of the current state of affairs with regard to evaluation methods and experiential value. This enables the development and implementation of a socio-economic evaluation from the citizens' perspective in the ComCoast project.

1.3 Approach to quick scan literature review

In order to conduct the quick scan literature review, a variety of magazine articles, online reports and books and catalogues were collated. The following keyword searches were used:

- socio-economic valuation;
- socio-economic (e)valuation;
- coastal zone management;
- (coastal) wetlands;
- experiential value (non-research);
- citizen values assessment/analysis
- societal cost and benefit assessment/analysis
- conditional valuation method;
- contingent valuation method;
- citizens' perspective;
- citizens' perception.

Numerous articles, reports and books were researched. Four reports in particular deserve special mention, as they reflect the current state of affairs with regard to evaluation methods and experiential value surveys. This memo makes frequent reference to the following reports:

- ***De waarde van natuurwaardering (the value of valuing nature)***, Almaši et al (2004);
- ***Vergelijking afwegings- en waarderingsmethoden voor waterbeheerprojecten*** (***comparative analysis of (e)valuation methods for water management projects)***, Resource Analysis/SEO (2003);
- ***Sociale aspecten-onderzoek; de stand van zaken*** (***societal aspects; the current state of affairs***), Workel, Bouwdienst, 2000;
- ***Toetsen op duurzaamheid voor het waterbeleid (sustainability test water policy) Test***van Meeusen et al, LEI, 2001.

1.4 Chapter breakdown

The evaluation methods are introduced in Chapter 2. Chapter 3 outlines the methodologies used for assessing experiential value. Chapter 4 assesses whether the combination serves a useful purpose and identifies four - potentially successful - methods, including a recent example of each method.

2 Evaluation methods

This chapter examines two important evaluation method used in the Netherlands: the Social Cost-Benefit Analysis (SCBA) and the Multi Criteria Analysis (MCA). Within the SCBA, particular emphasis is placed on the Cost Effectiveness Analysis (CEA). The SCBA-specific OEI guideline is also discussed, as are a number of economic valuation methods.

2.1 SCBA

2.1.1 Definition of SCBA

The SCBA method applies the principles of welfare economics to social decision-making issues. Per selected issue, for example alternative plans, the object of the exercise is to determine:

1. The input of the production factors, i.e. the societal costs to implement a plan;
2. The benefits in the form of commodities used to satisfy social needs

Broadly speaking, SCBA embraces the same principles as a Costs Benefits Analysis (CBA). The CBA can be defined as an evaluation method that provides a quantified summary of the advantages or disadvantages of alternative projects or measures in relation to the (dynamic) reference situation. These advantages and disadvantages are plotted out in the form of cost/benefit items on a cost/benefit balance sheet, where possible expressing these items in monetary terms.

The main - and biggest - difference between an SCBA and a CBA is that an SCBA (or a socio-economic CBA) incorporates not only all direct financial costs and benefits, but also indirect economic costs and benefits. In this respect, the SCBA is a systematic inventory of all the positive and negative impacts and effects of a particular project or policy measure. If the project or policy measure secures a net positive balance in terms of costs and benefits, it can be concluded that the project makes a significant contribution to societal welfare.

An SCBA aims to contribute to a more rational decision-making process by collating the outcomes and consequences of a project or policy measure and drawing up the end balance. The SCBA is not - and does not portend to be - a substitute for the decision-making process. In the decision-making process, other considerations are taken into account, including legal, political, budgetary and moral considerations.

The aim of an SCBA is to produce a highly accurate estimate of the future costs and benefits of a project. An SCBA is thus a relative instrument, an excellent tool with which to compare alternative policy and project options. It should however not be taken to be an exact or accurate forecast of the costs and benefits - they are estimates only. It is vitally important in this respect that figures are clearly presented and explained.

Different values are assigned to societal costs and benefits. Combined, they represent the total costs and total benefits of a project. The SCBA typically makes a distinction between commercial value and non-commercial value, which in turn can be broken down into sub-categories. The balance, or the total socio-economic value, is the sum total of the commercial value and non-commercial value.

Commercial value is typically broken down into the following:

- Production value - the value of products produced by the site (e.g. fish and timber; tangible products);
- Information value - the value of the information provided by the site (e.g. aesthetic, religious or scientific information, the production value of services);
- Regulation value - the value of the regulatory processes (typically indirect, e.g. water purification or climate control).

Within the non-commercial value component, we can also typically distinguish:

- Existential value - the value attached to the site by the present generation, irrespective of use (people know the site exists);
- Optional value - leaving open the option of allowing the present generation to use the site in the future;
- Inheritance value - the value for future generations for using the area.

2.1.2 CEA

The Cost Effectiveness Analysis (CEA) can be seen as a variant of the SCBA. A CEA makes a distinction between the (operational) costs of alternative policy options and the impact and effects (usually benefits). Unlike the SCBA, the CEA presupposes that there is no substantial difference between the alternatives in terms of their costs or effect variables. We can therefore distinguish two types of CEA:

1. An analysis into the “lowest cost alternative to effect ratio” of all the alternatives;
2. An analysis into the “most beneficial effects alternative to costs ratio”.

Sub 1. Lowest cost alternative
This type of CEA may for instance be applied to make a distinction between different measures to solve the same (water) problem. Although the costs of the variants differ, the effects and impact are roughly identical.

Sub 2. Most beneficial effects alternative
This CEA variant is applied in cases where it is clear that the costs of the different alternatives have no impact on the eventual decision-making problem, or if the alternative solutions must be carried out within a defined budget limit. In both the above cases, the costs are fixed and the impacts and effects of the alternative policy and project options may differ. These differences enable the decision maker to prioritise the alternatives.

In conclusion: A CEA is a 'stripped-down' version of an SCBA. The first variant is limited to assessing (operational) costs, which can usually be expressed fairly easily in monetary terms. In the second variant, costs are typically left out of the equation, comparing instead the impacts and effects of different alternatives. If it is not immediately apparent which alternative achieves the highest score, it is possible to apply the monetary valuation methods as used in the SCBA (see Paragraph 2.1.4). If this proves difficult or impossible, for example because landscape quality or ethical issues are taken into consideration, other methodologies can be deployed to compare the impact of the alternatives and prioritise the alternatives. In principle, the multi-criteria methods can be used in this respect (see paragraph 2.2)

2.1.3 OEI guidelines

In the Netherlands, the concepts of SCBA and infrastructure are inextricably linked to the OEI guideline. OEI, the Survey of Effects of Infrastructure [Dutch: Overzicht Effecten Infrastructuur] – guideline is aimed at mapping out the effects of infrastructure in a more systematic and clear way. Since 2000, compliance with the OEI guideline has been mandatory for conducting a CEA for all major national infrastructure projects (> 0.45 billion Euro). Unlike the Environmental Impact Assessment however, it is not enshrined in laws or statutes.

The completion of infrastructure projects such as roads, railway lines, waterways, airports etc have impacted not only on accessibility and mobility, but also on other issues. As outlined above, these effects may be expressed in societal costs and benefits. Due to the discrepancy between the costs and benefits of the various effects of infrastructural projects, it was deemed necessary to draw up an evaluation guideline governing all new projects.

The OEI framework, previously the OEEI (Economic Effects Infrastructure Research program) [Dutch: Onderzoeksprogramma Economische Effecten Infrastructuur] was drawn up in 2000 by Erasmus Expo-centrum Rotterdam on behalf of the Ministry of Transport, Public Works and Water Management and the Ministry of Economic Affairs[1].

The objectives of the OEI guideline are threefold:
- To inventorise the knowledge concerning economic effects and impacts;
- To promote closer collaboration between institutes;
- To develop a communal framework of key criteria, definitions and methodologies.

[1] Offered in an accompanying letter to the Dutch Lower House (1999-2000 parliamentary session, 26 428, no 21)

As previously mentioned, compliance with the OEI framework is compulsory for conducting a CEA for all major projects of national importance (> 0.45 billion Euro). Work is currently underway on achieving a simplified OEI structure for other projects falling under the Multi-annual Infrastructure and Transport programme (MIT projects, (> 227 billion Euro). For all other projects, it is advisable but not compulsory to draw up a CEA in accordance with the OEI guidelines.

2.1.4 Monetary valuation methods within SCBA

If the SCBA-specific costs and benefits were related to well-functioning markets, the market prices would provide us with all the necessary information on societal values. This is however rarely the case. To this end, other monetary valuation methods needed to be devised.

Per SCBA value, the most suitable method is selected per study. These methods are not mutually exchangeable or transferable and cannot always be applied in practice. The following monetary valuation methods are typically used in an SCBA:

1. the Production Function Approach;
2. the Preventative Expenditure Technique;
3. the Hedonic Pricing Method;
4. the Travel Cost Method;
5. the Contingent Valuation Method;
6. the Conjunctive Measurement Method;
7. the Welfare Valuation Technique;
8. Allocation Games.

These methods are outlined below.

Sub 1. The Production Function Approach
The Production Function Approach evaluates changes in production relationships of natural or man-made systems as a result of environmental quality changes. For example a drop in fish catches due to deteriorating water quality as a result of polluted wastewater caused by the negligence of a nearby factory. If the correlation between the water quality (dose) and fish catch (response) is known, it is possible to calculate the value of the deterioration in water quality. The changes in the monetary proceeds of production (fish catch) can then be translated via the dose-response relation into a monetary counter-value of the environmental impact (water quality).

Sub 2. The Preventative Expenditure Technique

This method takes as its premise the preventative expenses incurred by households, companies or governments to mitigate or prevent certain environmental risks or impacts. Examples include the costs of sound insulation (double glazing, acoustic baffles) to prevent or reduce noise pollution, or the costs of flood defences (dikes, embankments) to prevent flooding. Preventative expenses will only be made if the anticipated benefits of these expenses are greater than the anticipated nuisance caused by the environmental effect. The willingness to incur such expenses is an indication of the minimum costs of the effect or the minimum benefits of mitigating the effect.

Sub 3. The Hedonic Pricing Method
In the Hedonic Pricing Method, residential property and land price differentials are related to environmental variables. The basic premise of the Hedonic Pricing Method is that the prices of residential property prices are influenced by the characteristics of a particular environmental effect. This environmental effect can be expressed in monetary terms by taking residential property and land prices into consideration.

The impact of the environmental effect can be both positive and negative. They may for example concern time differentials, related to changes in the environmental effect. It is also possible to analyse differences between sites with identical types of residential property, but with one important different environmental variable (for example a drop in value due to increased noise levels).

Sub 4. Travel Cost Method
The Travel Cost Method mainly measures the recreational value assigned by visitors to certain recreational sites (parks, beaches, nature). Monetarisation is based on the time it takes to travel to and access a certain site, and the costs incurred.

In other words, the TCM examines the actual costs incurred and actual choice of recreational site. The basic premise of the Travel Cost Method is that people will only visit a site if the expected benefits outstrip costs. The costs are thus taken as an indicator of the benefits (recreational values. The costs incurred are plotted against the benefits of not visiting a site (reference situation.

Sub 5. Contingent Valuation Method
The basic premise of the Contingent Valuation Method (CVM) is that people always have a preference for particular types of goods - including non market environmental attributes or amenities. The purpose of the CVM study is to elicit these (hidden) preferences by conducting a survey. In these surveys, a hypothetical market is created, where the respondent is given information on the attribute or amenity in question, the end user, the person paying for the goods and the method of payment. The economic value is typically measured based on the respondent's willingness to pay for an improved qualitative or quantitative good, or the willingness to accept compensation for a damaged good. The presumption is that this expressed - hypothetical - willingness corresponds with the actual willingness if a genuine market existed.

Sub 6. The Conjunctive Measurement Method
The Conjunctive Measurement Method measures the (hidden) preferences for environmental attributes and amenities by asking respondents to prioritise cards describing different situations relating to the environmental attributes and amenities and assigning a score where required. Each card (also known as a vignette) contains a description of an environmental attribute. The attributes of a lake could for instance include water quality and the consequences for e.g. swimming or fishing, accessibility and accommodation in the surrounding area. If one or more of the attributes has a monetary value (e.g. admission prices), a monetary value can be assigned to the environmental amenity. Unlike the Contingent Valuation Method, the respondent is not asked directly to assign a monetary value; rather, the monetary value is deduced from the order of priority specified by the respondent.

Sub 7.
The Welfare Valuation Method measures the (hidden) preferences for environmental commodities by asking respondents to evaluate their perceived level of well-being. Welfare and well-being are broad concepts; on the basis of a survey, the degree to which respondents are content with their life is measured in its entirety. This is done on the basis of a 'ladder of life' question, in which respondents are asked to indicate their perceived level of welfare. The answers to this question can be related to multiple variables that explain their perceived level of welfare and well-being (such as income, job satisfaction, family circumstances, age, health, education and environmental effect). In principle, each of these variables can be monetarised, provided one of the other variables is a monetary variable.

The basic premise is that a household or respondent can achieve the same level of welfare in a variety of ways. Once a person has reached a certain welfare level, an infinite number of variable combinations are possible. Once the welfare level is known, it is possible to gauge the extent to which the respondent's income, or other monetary variable, would have to change to compensate for the change in the environmental commodity (to maintain this level).

Sub 8. Allocation Games
The Allocation Games method simulates a market by assigning a budget to a respondent and asking him or her to allocate this budget across different expenditure categories, for example environmental commodity to be valued (e.g. safeguarding biodiversity in a nature reserve or reducing vehicle emissions). Other categories include substitutes (other environmental commodities or public commodities, such as road safety) and market commodities (priced goods such as a bicycle).

Each expenditure category has a monetary value, and a hypothetical budget is defined. This budget need not necessarily be expressed in monetary terms. It can also be expressed using a system of points or marbles. The budget must be defined in such a way that respondents are forced to make a definite and clear choice. Each respondent is asked to allocate the budget according to his/her own preferences. A monetary value can then be defined.

2.2 MCA

Evaluation methods are decision-making tools. This implies that a choice must be made from a group of alternatives. If this choice is made on the basis of one criterion, the decision-making problem is relatively uncomplicated. However, the decision-making process becomes more complex once more criteria come into play. Each alternative is assigned a score per criterion. It is only possible to select an alternative on the basis of the highest score if a ***dominant*** alternative has been identified. An alternative is dominant if this alternative achieves the highest score on one or multiple criteria and is at least equal on all other criteria.

In - typically - more realistic situations, there is no dominant alternative. As such, the scores of the alternatives will need to be compared according to a set of different criteria. The degree to which one alternative achieves a higher score in e.g. economic gain must be weighed up against the more environmentally friendly attributes of another alternative. One way in which to circumvent this problem is to deploy the so-called Multi Criteria Analysis (MCA).

Multi-criteria problems have a number of notable characteristics:

- multiple objectives and/or criteria;
- conflicting criteria, for example market share versus profit, comfort of a car versus fuel consumption, or the negative impact of a rise in water levels for farmers versus positive impact on the landscape;
- the criteria are measured in non-comparable - and typically qualitative- units).

These characteristics render the decision-making process highly complex. To simplify this complexity, a range of MCA methods have been devised to structure and support the decision-making process.

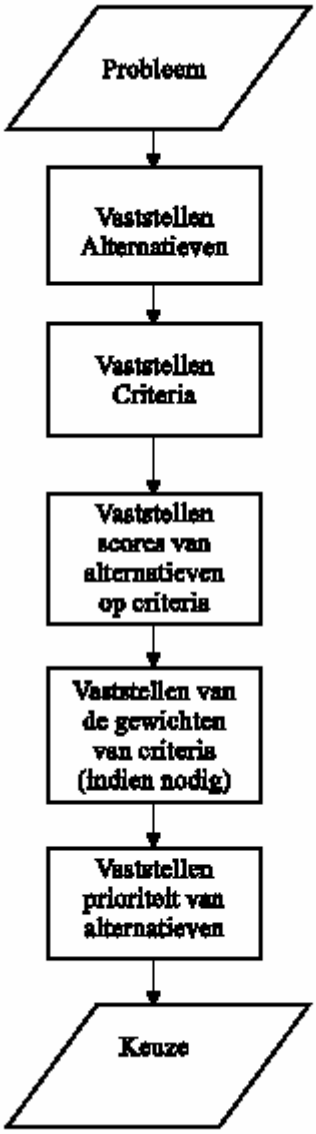

Figure 2.1 General framework Multi Criteria Analysis

The approach to an MCA problem is multi-phased (see figure 2.1). This structured approach to the decision-making process is a handy tool to focus adequate attention on each phase. To this end, a number of MCA-specific choices must be made with regard to:

1. Determining the criteria;
2. Determining the scores against the criterion;
3. Weighting the criteria; and
4. Prioritising the alternatives (outcome of steps 2 and 3).

There are also a number of stages that apply to the decision problem in general, such as the 'problem definition' stage and 'alternative selection' stage. Criteria-based score evaluation alternatives prioritisation are characteristic of both MCA and non-MCA projects. However, the way in which these steps are taken in MCA studies are MCA-specific. The MCA-specific choices are briefly outlined below.

Sub 1. Determining the criteria
The alternatives are compared on the basis of these criteria. In principle, there is no limit to the number of criteria and the nature of the criteria incorporated in a decision-making process. However, the decision-making process becomes more complex once more criteria come into play. All situation-specific criteria must be specified. For each policy problem, it is essential to establish which criteria are relevant when prioritising different alternatives. In MCA, both qualitative and quantitative criteria can be incorporated. The quantitative criteria can be measured according to unit type (for example in hectares, Euros, number of animals and so forth).

Sub 2. Determining the scores of the alternatives
It is relatively easy to determine the scores of the alternatives against quantitative and measurable criteria (for example agricultural production measured in 'product' units). With regard to ***qualitative*** criteria, expert help is typically sought to assess the alternatives on one particular characteristic. The natural beauty of an alternative may for instance be expressed on a scale of 1 to 10. Depending on the preferred method, the scores can be standardised to increase the comparative qualities of the criteria. Standardisation is typically applied if the sum total of the scores of the alternatives against a certain criterion is one.

Sub 3. Weighting the criteria
If there is a (dominant) alternative which achieves the highest score against one particular criterion and no lower score on any other characteristic, this alternative can be instantly selected. In practice however, an alternative will achieve a higher score against certain criteria and a lower score against other criteria. For example, some alternatives may be more beneficial to the farmer, while another alternative may be more environmentally friendly. In order to make a firm choice, it is therefore essential to weight the different criteria according to their relative importance. This weighting reflects the preference structure or preferences, for example the relative importance of the environment in relation to economic gain in a specific problem situation.

Weighting is thus an important step in solving an MCA problem. There are different ways to weight criteria. Examples include:

- A paired comparison: the relative importance of a criterion is gauged on the basis of a paired comparison. Two criteria are compared; the more important criterion (and degree of importance) is prioritised. On the basis of the collated comparisons, the criteria can be weighted;

- The point allocation: the decision maker allocates a set number of points to the criteria. For example, allocating 100 points across the criteria enables the decision-maker to weight and prioritise each criterion. A greater number of points thus signifies a higher relative importance of the criterion;
- Regression: the relative importance of each criterion can be deduced by assessing a variety of alternatives. For example, if environmentally friendly alternatives are systematically assessed positively, it can be deduced that the environment is an important criterion.

Sub 4. Prioritising the alternatives

Once the scores of the alternatives against the criteria and the relative importance of the criteria are known, the alternative policy and project options can be prioritised. A variety of prioritisation methods can be distinguished, including:

- Dominance: an alternative is dominant if it achieves the highest score on at least one attribute and is at least equal to the other alternatives on all other attributes;
- Maximin: the preference for an alternative is determined by its lowest score attribute (a chain is only as strong as its weakest link). If the low score is acceptable, the alternative will be selected;
- Maximax: the preference for an alternative is determined by its highest score attribute;
- Lexicographic method: the dominant attribute is determined and the corresponding highest score alternative selected;
- Linear additive function: the relative preference for an alternative (against a particular criterion) is multiplied by the relevant importance of the criterion, aggregated across all criteria.

The abovementioned methods differ in terms of the assumptions made with regard to the available information. Some methods are based on the assumption that only the criteria-specific scores of the alternatives are known. Other methods also require information with regard to the relative importance of a criterion.

Before the highest priority alternative can actually be selected, it is advisable to conduct a ***sensitivity analysis***. This analysis provides an insight into the impact (if any) of changes in the relevant importance of the criteria on the prioritisation of the alternatives. Conversely, it is also possible to gauge the impact of any change in the scores of the alternatives on the criteria. Another useful analysis is to gauge the impact if certain (less important) criteria are left out of the equation. The less this prioritisation changes, the more reliable the result of the analysis, as the outcomes are more stable.

Interactive MCA

It is also possible to supplement the MCA methods with so-called group decision-making processes, which draw a variety of decision makers or interest groups into the decision-making process. Different interest groups attach importance

to different criteria. Group A may attach more importance to the economic implications of a measure, while group B may find environmental consequences more important. The group decision-making process focuses specific attention on these different needs and interests.

Accuracy

There are numerous MCA methods. The outcome of an MCA is dependent on the selected criteria and methodologies. It is therefore vitally important that the criteria and methods are carefully and accurately identified. At first glance, the MCA appears to be a simple method to apply. However, extreme caution is advised to avoid the dreaded 'garbage in, garbage out' syndrome. There is a real and present danger of the results being distorted due to improper problem definition or incorrect preference identification. When establishing the preferences of the decision-makers, accuracy is of the essence, ensuring that the resulting weighting genuinely represents these preferences.

In an MCA, it is possible to carry out corrective ‘classification action’ by adjusting the different weightings of the effects. For example, it is possible to assign a different value to cost items that have the same monetary value but are charged to other parties.

In conclusion, the big advantage of an MCA is that a greater diversity of criteria can be incorporated into the analysis, making it easier to include unpriced goods in the evaluations. In an MCA, both qualitative and qualitative criteria can be incorporated. The criteria can be measured in different units and be mutually conflicting. Indeed, an MCA is often said to “compare apples and oranges”.

3 Measuring experiential value

The concept of experiential value is explained in the first part of this chapter. The next step involves exploring the different ways in which experiential value can be measured.

3.1 Definition of experiential value

Each citizen has a different perception of his or her environment. Correspondingly, social scientists have devised a number of theories relating to the experiential value assigned by citizens to their environment.

The Civil Engineering Division of the Directorate-General for Public Works and Water Management denotes experiential value as the environmental characteristics deemed important by citizens. In this respect, an environmental characteristic is a tangible feature of the living environment. This could be a physical, social, economic or environmental feature.

3.2 Valuation methods for measuring experiential value

Valuation methods are typically defined along the lines of the 2000 graduation project of Workel, commissioned by the Civil Engineering Division of the Directorate-General for Public Works and Water Management. Workel's methodologies dovetail neatly with the requirements of the ComCoast project: the methodologies must be practical and usable (this is also a requirement of an SCBA). In this context, four distinct social research methodologies are examined in more detail:

1. Landscape Perception and Evaluation method [Dutch: Schalen voor Perceptie en Evaluatie van het Landschap, SPEL];
2. Op en in de weg;
3. Experiential value survey;
4. Liveability impact report.

Per methodology, a brief description of the aims, approach and results is provided.

Sub 1. SPEL method
The SPEL method (Schalen voor Perceptie en Evaluatie van het Landschap) was devised by the Ministry of Agriculture, Nature Management and Fisheries to measure the experiential and amenity value of landscapes. The SPEL method is conducted on the basis of a written survey among citizens.

The basic premise of the SPEL method is that experiential value is based on a limited number of basic qualities that may have a positive or negative value. These include unit, use, naturalness, historic character, spatial qualities, management and sensory impressions and perceptions.

Combined, the qualities determine the experiential value; they are not mutually independent, but rather mutually influential. A quality is not experienced in isolation; experience is an integral or holistic event. The qualities are however measured separately and can have different weightings, as their contribution to the overall perception is not rigid.

Sub 2. “Op en in de weg”
The 1989 Project Policy Documents Guide of the Directorate-General for Public Works and Water Management has meanwhile been supplemented with a section on 'Societal Aspects'. Although the guide clearly identifies those aspects that deserve particular attention, it does not specifically address the issue of ***how*** these aspects should be investigated and examined. To this end, the TU of the Road and Hydraulic Engineering Institute [Dutch: Dienst Weg- en Waterbouwkunde] was assigned the task of collating methodologies and techniques. “Op en in de weg” describes the methodologies used to measure the societal aspects of safety, accessibility, barrier operation, noise pollution, visual hindrance, noxious odours and vibration nuisance, forced leave and social integration.

Researchers and experts have defined objective indicators for all societal aspects. The next step involves gathering data per indicator by drawing up an inventory using third-party and research observations. Citizens are not consulted or involved in this method.

Sub 3. Experiential value survey
The Experiential Evaluation survey has been devised by the Civil Engineering Division of the Directorate-General for Public Works and Water Management [Dutch: Bouwdienst Rijkswaterstaat] to incorporate the quality of the living environment from the citizens' perspective into a planning survey/EIA.

A comprehensive experiential value survey consists of four phases. Each component builds on the findings of the previous component. Broadly speaking, an experiential value survey comprises of:

1. Environmental analysis or interest analysis; concise stocktaking survey, mapping out the study field, relevant interests and actors.
2. Exploratory experiential value survey; qualitative research inventorising the experiential values of a site on the basis of open-ended in-depth interviews.
3. Experiential value survey assessment framework; quantitative research testing the experiential value and determining the relative importance, creating an evaluation framework in the process.
4. Impact valuation; impact assessment determining the effect and impact of an intervention on the experiential quality of the living environment. The end product is a weighted and substantiated overall assessment. The impact valuation method can also be used to compare alternatives.

Sub 4. Liveability impact report

The liveability impact report was devised at the University of Wageningen as a response to drastic plans affecting rural areas and to address the fact that no tools were readily available to measure the impact of certain measures on liveability.

Liveability is a key yardstick specifying the quality of the human living environment within a certain territorial unit. The model makes a distinction between four aspects of the living environment: socio-cultural, socio-economic, political-administrative and spatial aspects. These aspects effectively constitute the 'breadth' of the concept of liveability.

In addition to breadth, the qualitative yardstick for evaluating the liveability of the living environment also requires 'depth. This is provided by the concepts of commercial value, experiential value[2] and conversion value.

The liveability model is represented by a matrix of the abovementioned concepts. The practical aspects of the matrix are set out by a combination of methods and techniques: in particular document analysis, interview, group interviews and surveys. There is no specific standard method for the liveability impact report.

[2] This particular concept of experiential value relates to sensory perceptions and must not be confused with the concept of experiential value as defined in § 3.1.

4 Evaluation methods and citizens' perspective

The findings of this chapter are based on the results of expert meetings and consultations.

There is very little consensus among experts on the feasibility of applying the citizens' perspective into an evaluation method, particularly when the citizens' perspective concerns an ‘experiential value’ and when the selected evaluation method is an SCBA. The main area of disagreement concerns the methodology deployed: while opponents raise major methodological objections to measuring experiential value, proponents believe experiential value can be measured accurately.

In this study, the 'battle of the methods' regarding the monetarisation of experiential value has been left out of the equation for the foreseeable future. The first step involves assessing whether the inclusion of the citizens' perspective serves a useful purpose. The next step involves assessing how the practical aspects of the citizens' perspective can be set out. The conclusion is that the monetarisation of experiential value is one of three potentially successful methods. The chapter is concluded with four practical examples of projects where the citizens' perspective was successfully incorporated.

4.1 The benefits of the combination

According to proponents, the benefits of incorporating a citizens' perspective into a socio-economic evaluation are three-fold:

1. Citizens bring site-specific knowledge and expertise to the analysis;
2. This ensures that the focus is not only on welfare, traditionally the key aim of an SCBA, but also on ***wellbeing***;
3. The results have a broader support base (less risk of encountering objections).

4.2 Suitable methods for the combination

On the basis of literature reviews, expert meetings and consultations, four methods have been identified that have the potential to set out the practical aspects of the citizens' perspective within the evaluation framework:

1. Monetarising experiential value in an SCBA. From the initial phase of the SCBA - the problem analysis phase - experiential value must be comfortably accommodated among the other values and carefully defined and structured;
2. Experiential value can be measured according to the MCA method, accommodating it alongside economic, ecological and landscape values;

3. The Economic-Ecological-Environmental (3E) method, which brings together economic, ecological and societal valuations;
4. Interactive structuring of the entire SCBA process with the general public.

The following sub paragraphs include examples of each method. Most experts believe a combination of 1, 2 or 3 with 4 produces the best results.

4.2.1 De waarde van natuurlijke peilen (The value of maintaining natural water levels) – experiential value and SCBA

This project was conducted using a combination of monetary evaluation methods and experiential value surveys (Brouwer et. al., 2003). The aim of the project was to map out the societal value of allowing a more natural approach to managing water levels in the province of Friesland. In the 500 face-to-face interviews, data was collated on travel costs of visitors to the site (travel cost study), their preferences and evaluation of two potential future situations (conditional valuation study) and their evaluation and relative importance assigned to the current environmental characteristics (experiential value survey).

On the basis of the conditional valuation and the experiential value survey, results revealed that a more natural approach to managing water levels was the preferred option. The experiential value survey additionally provided information on the key environmental characteristics, namely nature, tranquillity and space. It was therefore advised that these characteristics be maintained or improved as much as possible if deciding to manipulate levels. The conditional valuation method additionally specified the (tax) sums that people were willing to contribute to both situations.

Added value
The experiential value survey is a highly suitable method for making experiential value a credible component of an SCBA. It focuses not only on the sum of money that people are willing to allocate to achieve a particular situation (willingness to pay) or preserve (willingness to accept), but also to map out those environmental characteristics that are highly valued. This provides excellent input for the design of compensating measures.

The advantage of an experiential value survey over CVM is that citizens are not required to specify a choice, but rather to make an indirect judgment on the basis of those environmental characteristics deemed particularly important. CVM, conversely, does require citizens to specify their exact preferences. According to the OEEI study group (2000), the results of this method are difficult to verify and easy to manipulate. In this respect, experiential value surveys serve not only as a verification tool, but also to generate information with regard to potential compensating and mitigating measures.

4.2.2 Lent – Experiential value according to MCA method

The Project policy document / EIA Dijkteruglegging Lent (Lent Dike Setback) examined the alternative policy options for widening the river Waal near Nijmegen. An experiential value survey was conducted to cover the EIA component relating to the societal aspects of the various plan alternatives (Flinterman and Van Konijnenburg, 2004).

The aim of the study was to:

Obtain an insight into the impact and effects of the alternatives and variants for the dike setback at Lent on the quality of the living environment as perceived by local residents.

Determining the criteria
The first part of the "Dijkteruglegging Lent" experiential value survey was concerned with examining how the citizens of Lent perceive their living environment, and which environmental characteristics play a part. On the basis of these results, a Multi Criteria Analysis (MCA) was used to assess and evaluate the societal effects of widening the river.

Determining the scores
The experiential value study produced three societal experiential values (societal aspects) that had not been covered by any of the other sub-studies. These concerned societal safety, social cohesion and social unrest / social peace. For these societal aspects, specific attention was paid to the societal effects of the alternatives and variants. The other experiential values showed a certain degree of overlap with criteria defined in other sub-studies. The impact and effects on these experiential values were described on the basis of findings from other sub studies.

Weighting and prioritising
The impacts and effects were clustered according to factors. Per factor, weighting was determined by calculating the mean average weight of the amenity values relating to each factor. The experiential values were weighted according to the relevant significance attached by the residents of Lent to the experiential values. Using the factor weightings, the valuations of the effects on the factors were extrapolated to one overall assessment per alternative and variant.

Most Experientially Friendly Alternative
On the basis of the overall assessment, the 'highest score experiential alternative' could be identified. This alternative is known as the Most Experientially Friendly Alternative. In the below diagram - which serves solely as an example - this is the third alternative, as this has the highest overall score.

Example Impact table
Table 5 Overall assessment impacts of all factors

		Alternatives & phasing variant				
Factor	**Wei**	**Ref**	**AO**	**A1**	**A2**	**A3**

Societal safety	97	0.0	-2.0	-1.0	-1.0	0.0
Social cohesion	56	0.0	0.0	-2.0	-2.0	0.0
Rural environment	62	0.0	- 0.6	- 0.7	0.0	- 0.4
River dynamics	1	0.0	-1.0	-1.0	-1.0	-1.0
Traffic and transport connections	83	0.0	-0.6	-1.4	-1.4	- 0.6
Space in and around the home	47	0.0	-3.0	-1.0	-1.0	-1.0
Traffic levels on the dikes	35	0.0	-0.2	0.5	0.5	0.0
Prins Mauritssingel	155	0.0	-0.6	-2.0	-2.0	-1.2
Rural development	136	0.0	- 2.0	- 1.7	- 1.6	- 1.0
Flooding	28	0.0	1.0	1.4	0.5	1.0
Total all factors	-	0.0	-1.1	-1.3	-1.2	-0.6

The yellow box represents the highest overall score

The above table contains an overall summary of the impact assessment in relation to the current situation for the ten factors. The first column shows the weighting per factor (We), the second column the current situation (ref), the third the autonomous development (AD) and the columns A1 to A3 show the assessed alternatives. The assessment ranges from +3 (strong experiential improvement) to - 3 (significant experiential deterioration).

4.2.3 Benefits of water – salt case studies – the 3E method

In the context of the Waterverkenningen Project (water reconnaissance), the Directorate-General for Public Works and Water Management set up the umbrella project “Baten van Water” (Benefits of Water).
The general approach adopted for the Economic-Ecological-Emotional (3E) project is shown in Figure 4.1. The approach encompasses the following steps: (1) identifying the aims and objectives and solution (2) demarcation of the case studies and the related physical effects; (3) qualitative test of the impact assessment in terms of ‘Economic’, ‘Ecological’, and ‘Emotional’; (4) definitive demarcation of the case studies and the alternatives; (6) quantifying the physical impacts; (7) valuation of the physical impacts by the three Es; (9) integral weighting the different benefits; (10) disseminating the results. Steps 3 and step 6 involved intensive contact between the various disciplines to safeguard the consistency of the project.

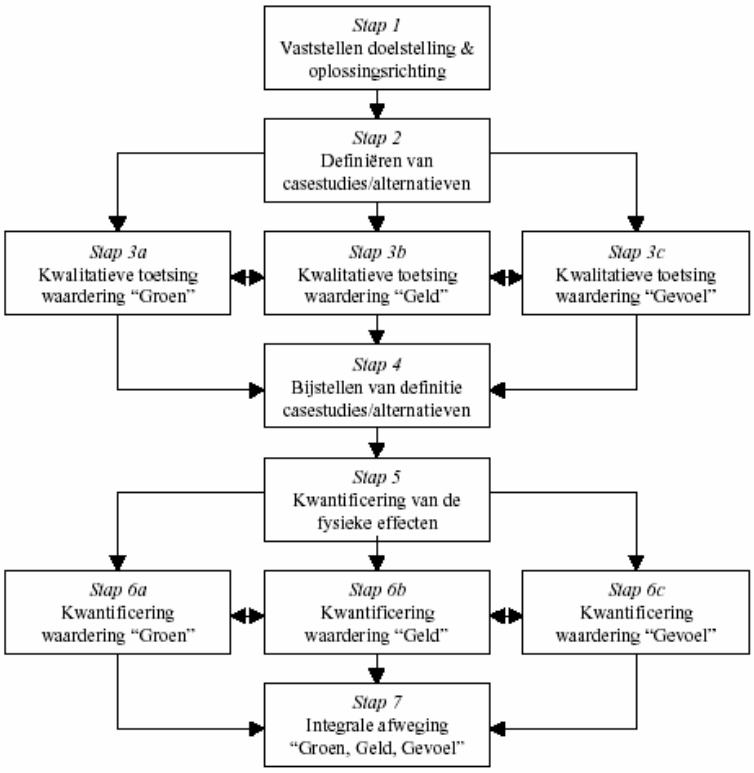

Figure 4.1 Method in salt case studies of Benefits of Water.

A conscious decision was made ***not*** to achieve a uniform (numerical) interpretation for all aspects (e.g. Money, ecological footprint, energy). Instead, an integral evaluation framework with evaluation methods was used to map out the three individual dimensions (Ecological, Economic, Emotional), clarifying the evaluations.

All three dimensions contain the following steps:

1. ***Quantifying impacts***: estimating the physical impacts caused by a change (e.g. change of species composition or agricultural productivity);
2. ***Impact valuation***: assessment of those system changes by testing against one or multiple criteria;
3. ***Evaluation***: the prioritisation of valuation criteria enables the prioritisation of alternatives.

The Ecological, Economic and Emotional evaluations differ radically in terms of the actual evaluation methods deployed.

Ecological Evaluation
Ecological evaluations are concerned with estimating the (ecological) value, 'naturalness' and (healthy) ecological performance of ecosystems. The ecological evaluation process is effectively a process that orders, combines and interprets 'rough' ecological data

into a well-organised collection of evaluation parameters or indicators. Four distinct aspects can be identified:

1. (inter)national diversity of ecosystems;
2. (inter)national species diversity;
3. naturalness;
4. ecological performance of water systems.

The approach quantifies a number of indicators within the evaluation framework. These indicators give an initial indication of the ecological values of alternative policy options. It makes sense to base this evaluation on the 'ecological' aims and objectives contained in water and nature policies. After all, these aims outline the ultimate objectives with regard to nature. The next step involves assessing the interrelationship between these indicators. The final step involves addresses the citizens' perception of nature. There is no all-encompassing definition of nature. Rather, we can distinguish numerous visions of what nature entails. These visions are essential to our understanding of how aspects such as naturalness and diversity are evaluated. These visions of nature provide a base for assessing alternatives to gain an impression of the interrelationship between criteria such as biodiversity and naturalness.

Economic valuation
Economic valuation distinguishes itself from ecological and socio-cultural valuation in a number of ways. In particular, economic valuation typically integrates a broader range of impacts and effects into the analysis. Economic valuations go beyond assessing the costs of potential interventions. In addition, an attempt is made to evaluate societal benefits. In the investigated cases, 'Hondsbossche Zeewering' and 'Zeereservaat in de Voordelta', a range of methodologies were used to express the economic value of a limited number of effects. This economic value can relate to actual use, consumptive or otherwise, or purely to the 'existence' of a particular situation.

Emotional valuation
'Emotional valuations' present the benefits of a project from a socio-cultural perspective. This ties in with the current trend of incorporating 'quality' into spatial planning; reflecting a desire to make optimum use of the scarce space in the Netherlands. Of particular importance is the issue of how a spatial project can create value for those people who have a relationship with the area in question, i.e. (future) residents and visitors.

Based on the phasing of the plan process, we can identify three sub questions:

1. How do the project initiative takers intend to create value for people? Which project aims and measures are involved?
2. What action are the initiative takers taking to prevent the planning process from becoming bogged down in misunderstandings or disagreements on the value to be created?
3. Which methods can be used to predict which project alternative will create the most value for people?

When evaluating the project alternatives, initiative takers can use the last sub question to explicitly state the project aims and objectives, focussing specific attention on ‘sensitive’ project components.

Integral evaluation

An integral evaluation is conducted when a comprehensive picture of a project is required, for example to present the effects and impacts of a potential project to interested parties and citizens. This requires an appealing, clear and objective presentation of objectives and effects/impacts of the intervention. It is vitally important that the presentation is clear and easy to understand. Directors and managers also require a comprehensive picture of the likely effects of the project to decide between different alternatives: only then can they make a decision on what to do or indeed what ***not*** to do. The evaluation and ultimate decision are often related to policy objectives. The information concerning project effects should therefore, where possible, be tailored to the policy objectives; in that sense, the information provided should be as comprehensive as possible.

This study aggregated the available information into three indices, namely Economic, Ecological and Emotional. This necessitates the application of a quantitative evaluation method in the three categories. Although these three indices have not been aggregated into an overall index, graphical presentations have been included to enable a balanced approach to the indices. The purpose of an integral evaluation is to provide an insight into the economic, ecological and socio-cultural qualities of the alternatives and to support the mutual evaluation of these qualities.

4.2.4 SCBA Waterbeds – interactive process

The Netherlands is 'suffering' from a substantial dredging backlog. However, does it make socio-economic sense for the Netherlands to intensify dredging activities? If so, which sectors are expected to benefit most from making up the backlog? These are the key questions contained in the Maatschappelijke Kosten-Baten Analyse (MKBA) Waterbodems project (Waterbeds Social Cost-Benefit Analysis (SCBA). This project was conducted by AKWA (Aquatic Sediment Expert Centre) on behalf of the State Secretary for Transport, Public Works and Water Management.

The SCBA was carried out in accordance with the OEI guidelines. The analysis was conducted in the autumn of 2003 and has since been concluded. Three alternatives were examined: the null alternative (current dredging activities), the standstill alternative (no increase in the backlog) and the project alternative (making up the backlog over a period of 10, 25 of 40 years). The State Secretary for Transport, Public Works and Water Management has presented the report to the CPB and the Advisory Committee on Water (ACW).

Process
The SCBA was drawn up in consultation with different authorities and representatives, taking into account various societal needs and interests. The area of expertise can broadly be divided into "Parties Experiencing Problems" and "Parties Contributing Solutions". It is therefore vital to paint an overall picture of the costs and benefits of the project. The project was structured in such a way that interested parties could make their contribution at set times. A tailor-made approach was adopted, including workshops and expert meetings.

Data relating to dredging quantities and other estimates was exchanged with the other projects of the Beleidsprogramma Tienjarenscenario Waterbodems (Waterbeds Ten-Year Scenario Policy Programme), the Nota Mobiliteit (Mobility Policy Document) and Ruimte voor de Rivier (Space for Rivers). The Advisory Committee on Water acted as the expert committee, while the Centraal Planbureau (Central Planning Office) was charged with testing the end product.

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