

National Centre for Risk Analysis & Options Appraisal

**GUIDANCE ON ECONOMIC APPRAISAL IN  
THE ENVIRONMENT AGENCY**

**Jonathan Fisher, Vicky Pollard,  
Ronan Palmer, Frazer Smith**

Guidance Note Number 29

16<sup>th</sup> August 1999

Title: <u>Guidance on Economic Appraisal in the Environment Agency</u>	Guidance Note No. 29  Version 1.1 for circulation  Issue Date: 01 July 1999	
Approval	Signature	Date
J Irwin	<i>Jonathan G. Irwin</i>	16 August 1999
Distribution: Environment Agency Selected External		

ENVIRONMENT AGENCY



074232

## GUIDANCE ON ECONOMIC APPRAISAL IN THE ENVIRONMENT AGENCY: Executive Summary -

This paper provides guidance for senior managers in the Agency on:

- Why they may need to carry out an economic appraisal because of the legal duties under Sections 4 and 39 of the 1995 Environment Act and because of the need to allocation and use efficiently the Agency's limited resources(Section 2);
- What economic services could help them to carry out economic appraisals (Section 4);
- How they can select the level and type of economic appraisal that is appropriate to their circumstances so that they can readily commission such appraisals. It also explains the key elements of such appraisals (Sections 6 and 7).

An economic appraisal is an important part of integrated options appraisals. It should build on outputs of the scientific analyses of the environmental impacts and be linked closely with deliberative and participatory processes (eg public consultation).

The purpose of an economic appraisal is to aid decision-makers by analysing the likely environmental and economic implications of alternative options so as to seek the best option which yields the greatest environmental benefits at the lowest costs and so as to ensure that the option selected can be efficiently implemented.

A good economic appraisal includes not only the monetisable impacts **but also** the important intangible impacts and aspects. It is essential that an economic appraisal should be comprehensive and roughly right rather than precise but only partial - such partial estimates may not yield the right 'answer'.

Section 7.1 sets out a hierarchy of different levels of economic analyses geared to the Agency's needs and available resources. This starts with simple and qualitative appraisals carried out by Agency operational staff as part of their normal decision-making to more rigorous and quantitative economic appraisals for contentious cases. The level of analysis should be proportionate to the extent of conflict in the case.

The Environment Agency's approach to economic appraisal is to assess **all** main impacts encompassing **all** aspects and considerations regarding the options. This includes using monetary valuation of impacts *where the valuations are valid and robust*. This might include the costs of options and environmental impacts on marketable goods (eg agricultural crops, timber and properties) and recreation. However, it is unlikely to be feasible to obtain monetary valuations for many important intangible impacts on human welfare and ecological functions, on which physical information and a qualitative assessment are needed to enable decision-makers to determine their significance. Nevertheless, **any** decisions concerning these intangible benefits entails an *implicit* valuation of their importance. Therefore, it is important to estimate the costs of obtaining these environmental benefits to indicate the *implicit valuations* given by any decisions concerning these benefits.

## **GUIDANCE ON ECONOMIC APPRAISAL IN THE ENVIRONMENT AGENCY**

### **1. Introduction**

This paper provides guidance for senior managers in the Agency who need to carry out economic appraisal of the options they face or who need to commission economic appraisals: It aims to inform them and others outside the Agency about:

- The reasons for carrying out an economic appraisal (Section 2);
- What economic services they could draw on in the Agency to carry out an economic appraisal (Section 4);
- How to select the level and type of economic appraisal that is appropriate to their circumstances and the key elements of such appraisals (Sections 6 and 7).
- the Agency's present position on the application of economic appraisal.

This guidance is part of a compendium of the techniques that the Agency can use for integrated appraisal of the environmental, economic and social implications of options.

### **2. Reasons for doing an Economic Appraisal**

#### **2.1 Legal Duties**

##### **Sustainable Development Aim**

Section 4 of the Environment Act 1995 states that a principal aim for the Agency is to contribute to the achievement of sustainable development. Sustainable development entails integrating and balancing economic development and environmental and social objectives. In discharging its functions to achieve this aim, the Agency has to take account of the wider costs and benefits of its actions.

##### **The duty to Take account of Costs and Benefits (Section 39 of the Environment Act)**

Under Section 39 of the 1995 Environment Act, the Agency has a duty to take account of the likely costs and benefits in deciding whether or not to exercise its powers, and in deciding how to exercise those powers (see Box 1)<sup>1</sup>.

**Box 1: 'Costs and Benefits Duty', taken from Section 39 of Environment Act, 1995:**  
*The Agency shall, unless it is unreasonable for it do so in view of the nature or purpose of the power, take into account the likely costs and benefits:  
in considering whether or not to exercise any power  
in deciding the manner in which to exercise any such power*

---

<sup>1</sup> Similarly, the Agency has a legal duty under the Environmental Protection Act 1990 concerning Integrated Pollution Control to determine the Best Available Techniques Not Entailing Excessive Costs in reviewing authorisations for major industrial processes.

This duty refers to the Agency's powers. It does not affect the Agency's obligations to discharge specific duties or to comply with statutory requirements (eg under the Habitats Directive) or to achieve statutory designated targets. However, in these cases, the Agency still needs to do an economic appraisal of the cost-effectiveness of the options to achieve such targets at the lowest cost.

The duty does not apply where the Agency is not the decision-making body. For example, where the Agency is a statutory consultee (eg for land use planning decisions, or DETR's periodic review of the level of environmental protection expenditures required by the water industry). Nevertheless, the Agency may still wish to apply economic appraisal techniques to demonstrate and substantiate the significance of the environmental impacts and the need to reduce them. Moreover, in these cases, the Agency may need to scrutinise and comment on the economic appraisals carried out by the other parties (eg water industry's estimates of pollution abatement costs).

The duty does **not** require that a **quantitative** cost-benefit analysis is carried out in all cases, nor that the Agency's decisions are based just on the quantified benefits exceeding quantified costs. The Agency must *take account of all likely* costs and benefits of its actions, where the terms 'costs and benefits' are broadly defined. Hence the Agency's decisions are based on a broad consideration of the full environmental, economic and social implications of options. The duty does not restrict the consideration of costs and benefits to those which can be quantified or monetised.

## **2.2 Enhanced Balanced Sensible Decision-making**

These legal duties are in many ways similar to the balanced and sensible approach, which the Agency has traditionally applied in its decision-making. What they require is that the Agency's decision-making process is made explicit and auditable. Economic appraisal can help by providing a systematic way of analysing and reporting the economic implications of the Agency's options.

## **2.3 Allocation of Limited Resources**

The Agency, like other public bodies, has limited resources to meet a wide variety of pressing needs and tasks. Therefore it has to allocate these resources efficiently between its competing projects and programmes to obtain the maximum environmental benefits (or value for money).

## **3. Agency's Main Activities for which Economic Appraisal is Applicable**

The economic appraisals needs to be tailored to the characteristics and needs of the Environment Agency's diverse actions and responsibilities, which include:

- A large number of individual regulatory decisions. These have to be processed within a specific time limit so that the economic appraisal systems have to be streamlined accordingly.

- Strategic decisions and policy development, which usually require appraisals based on approximate estimates and best judgement information on the implications of the strategic options.
- Allocation and use of public and private funds between competing projects, which need to be appraised consistently in line with HM Treasury's guidance.
- Determine environmental best practice for the management of the Agency's estates.

#### 4 Economics Services Available in the Environment Agency

Table 1 outlines who could typically carry out the different levels of economic appraisals needed for the Agency's various types of work. The last three columns outlines the main sources of economic support services provided by the Chief Economist and the two economists at the NCRAOA and the economists currently employed in the Regions and the Economics Contacts in the Functions. Annex I details the locations and responsibilities of these economists. The allocation of these economic support services in the Agency depends on the priority needs for economic support across the Agency's activities. Given the small number of full time economists employed in the Agency, consultants will normally be used to carry out any major studies. The support services outlined in Table 1 focus on assisting with commissioning such consultants and ensuring that the studies are appropriately carried out. Section 7.2 provides guidance on how to select the appropriate type and level of economic appraisals for consultants to carry out.

Table 1: Economic Support Services Available in the Agency

Type of work	Who carries out the appraisals	Sources of Economic Expertise in the Agency		
		Regional economists and Economics Contacts in the Functions	NCRAOA Economists	Chief Economist
Specific regulations or projects				
Clear cut decisions (Level 1) or where qualitative appraisal reveals best option (level 2)	Agency's officers complete simple pro formas as part of their normal decision-making	Develop simple appropriate techniques (eg pro formas); Train team leaders in the practical integration of these simple economic appraisal techniques in their decision-making and provide them with information to cascade training to their teams	Assist functions to develop simple appropriate techniques and train team leaders on the application of these techniques and provide them with information to cascade training to their teams	Overall policy and advice on economic appraisal in the Agency (including advice on commissioning consultants, guidance on economic appraisal techniques etc)

Level 3 – contentious cases of regional importance	Regional economists or economic contacts in functions; Consultants for more complex analyses	Carry out scoping and full studies and commission consultants to carry out complex analyses	Guidance on economic appraisal techniques Provide advice on specific cases	
Level 4 – complex contentious cases of national importance	Consultants	Commission consultants	Carry out scoping studies and assist functions to commission consultants	
Strategic or policy decisions	Consultants	Carry out scoping studies and commission consultants	Provide advice/support (eg carry out scoping studies)	
Support head office			Provide economic analysis and advice	Provide economic advice

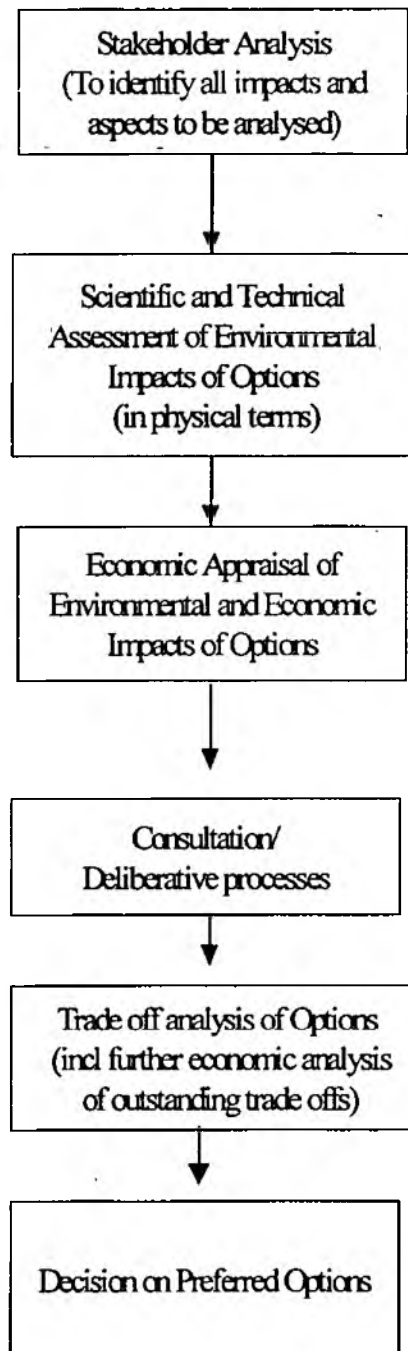
Examples of recent outputs provided by the economists shown in Table 1 include:

- We have published guidance on the interpretation of the duty under S. 39 (see above)<sup>2</sup> and the more detailed guidance provided in this paper. We have participated in preparing guidance for specific functions (eg flood defence).
- We prepared pro formas that the Agency's officers can readily fill out to assess the economic, environmental and social implications of options as part their normal decision-making (eg abstraction licensing, water quality regulations);
- Training in the application of economic appraisal techniques for Pollution Industry Regulation (PIR) inspectors and abstraction licensing team leaders<sup>3</sup>.
- The Agency has carried out more than 25 studies to develop and apply appraisal techniques for major contentious cases requiring in-depth economic appraisal.
- The Agency applied systematically Multi-attribute Techniques to rank 900 diverse water quality improvement measures, which input into DETR's decision that the water supply companies and sewerage undertakers should carry out about £8.5bn of expenditures on water pollution control and water resource management measures.

<sup>2</sup> Sustainable Development Guidance note 3 on taking account of costs and benefits

<sup>3</sup> Fisher, J. C. D. Sherwood, J, (1999) Training in economic appraisal for Abstraction licensing. National Centre for Risk Analysis and Options Appraisal Report No 13

## FIGURE 1: ROLE OF ECONOMIC APPRAISAL IN INTEGRATED OPTIONS APPRAISAL



## 5. Purpose of Economic Appraisal

The purpose of an economic appraisal is to aid decision-makers select the best options which yields the greatest environmental benefits at the lowest costs and ensure that the option selected can be efficiently implemented. It achieves this by:

- analysing systematically the likely environmental benefits and costs of the alternative options. This includes:
  - estimating the likely costs of the alternative actions;
  - indicating the significance of diverse environmental benefits and presenting them in consistent units so that they can be compared with the costs;
- helping persuade others about our decisions and the reasons for them.

## 6. Key Features of an Economic Appraisal

*Figure 1* shows that an economic appraisal is an important part of integrated options (or sustainability) appraisals. It builds on the scientific analyses of the environmental impacts to show the significance of the present environmental damages. It estimates the costs and benefits of options to achieve environmental improvements. Similarly, technical assessments of abatement options form the fundamental basis for estimating their costs and effectiveness.

Likewise, the economic appraisal should be closely linked with consideration of stakeholders' views and consultation with them. Thus **Figure 1** shows that, at the start, there should be an analysis of stakeholders' main concerns about the 'problem' and the implications of options, on which systematic economic analysis should then be carried out in tandem with the scientific analyses. This economic appraisal should input into a participatory process (eg focus group meeting of stakeholders) information on: estimates of the costs and economic implications of the options; and an assessment of the environmental benefits of the options in physical and qualitative terms, supported by indicators of their significance such as the value of marketable products affected (eg crops, timber). **Figure 1** shows that, if after such participatory deliberations, there remain specific outstanding contentious issues and trade offs regarding the options, then further deliberations and follow up economic appraisals may be needed concerning the economic and environmental implications of the options. This might include surveys covering a larger sample of the affected parties to inform decision-makers as to the extent and intensity of their views on these issues.

It is important to commence an economic appraisal at an early stage in the decision-making process. An economic appraisal should **not** just be brought in at the end to justify a decision already made without adequate consideration of its economic implications. An economic appraisal should be incorporated at the start in a scoping study to identify the objectives, the main options for achieving them and their impacts that are most likely to be significant and to collate the available information on these impacts. This can help focus any additional research accordingly on filling the most important information gaps. The NCRAOA is currently reviewing the available databases on valuation of environmental benefits and control costs to see how such databases could help the Agency to carry out scoping studies most cost-effectively.<sup>4</sup>

---

<sup>4</sup> Fisher, J. C. D, (1999), Proceedings of a Seminar on Environmental Valuation databases and Latest



An appraisal should help identify options targeted on tackling specific elements of the problem. It should set out clearly a baseline against which each option is compared - normally the 'do nothing' or 'business as usual' scenario of what would happen if no action is taken. An economic appraisal may need to examine incentives created by options (eg effects on prices such as for water), and possible responses to them.

The economic appraisal should assess the effects of the options on the welfare of affected parties - broadly defined. The impact categories should be specified so that there is no double counting of either costs or benefits.

A good economic appraisal includes not only the monetisable impacts **but also** the important intangible impacts, some of which can only be described or quantified in physical terms. **It is important that an economic appraisal should be comprehensive and roughly right rather than precise but only partial - such partial estimates may not yield the right 'answer'.**

Economic appraisal analyses the economic and environmental implications in the trade offs that are inevitably involved in the contentious decisions facing the Agency. For example, where there is an option with greater environmental benefits but higher costs.

Environmental assessment identifies the causes of the environmental impacts to identify the most effective improvement opportunities. Economic appraisal can build on this by analysing key factors that determine not only the environmental impacts but also the costs of options to seek the best option that yields the greatest environmental benefits at the lowest costs. Thus, the economic appraisal should identify the main components of the costs of the control options and analyse their determinants to identify ways of lowering the costs (eg allowing greater flexibility in the timing of controls and the choice of technologies). This can help ensure that the selected option can be efficiently implemented and the desired environmental benefits achieved..

There can be significant uncertainties surrounding the scientific and technical as well as the economic analysis of estimates of impacts of options. An economic appraisal should allow clearly and explicitly for these uncertainties by using available techniques such as sensitivity analyse using a range of plausible estimates.

## **7 Selection of Appropriate Economic Appraisal Techniques**

### **7.1 Level of Economic Analysis Needed**

Given the large number of decisions that the Agency has to make, it is neither possible, nor desirable to carry out a formal quantitative economic analysis of each

case. The extent and manner of any appraisal should be 'reasonable'. Therefore **Table 2** shows the hierarchy of economic analyses needed that make the best use of the Agency's resources.<sup>5</sup> Further details are provided in **Annex II**.

**Figure 2** shows how the level and form of an appraisal depends on the contentiousness of the options. Thus we first identify those actions that are clearly worthwhile (level 1). Where there are different options with diverse implications, the Agency field officers, as part of their normal decision-making, should complete pro formas describing qualitatively each option's implications to seek the best option to which the affected parties can fairly readily agree (level 2). More rigorous and quantitative economic appraisals may be needed for outstanding contentious cases which are significant either regionally (level 3) or nationally for the whole Agency (level 4).

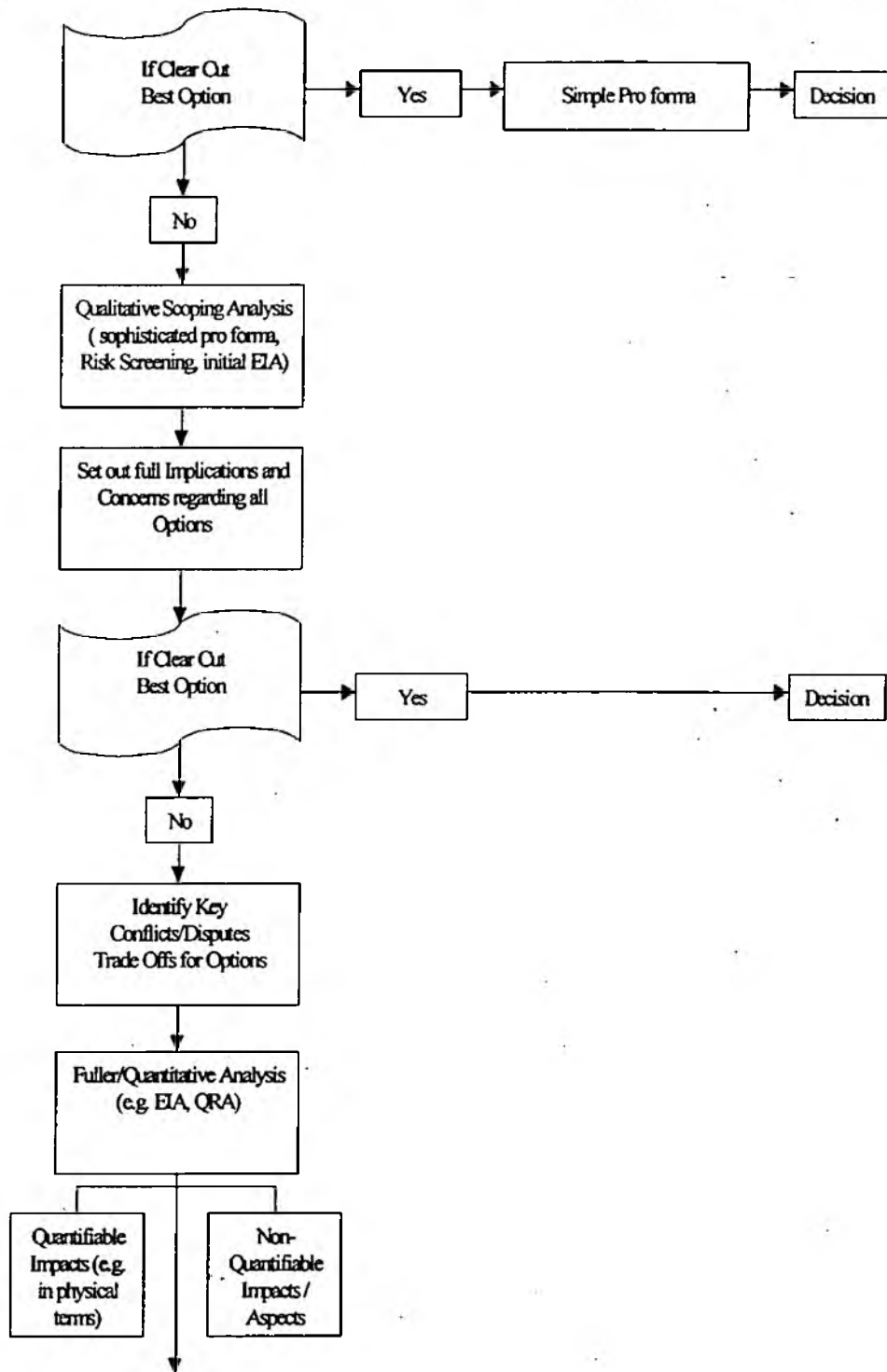
It is preferable to determine at an early stage what level of analysis is needed. But even if one starts at a lower level (such as level 2), then this should identify whether there remain significant contentious conflicts that cannot be resolved by refining the options so that further (level 3) economic analysis is needed. The information in the level 2 analysis will also provide useful base information for such further analysis.

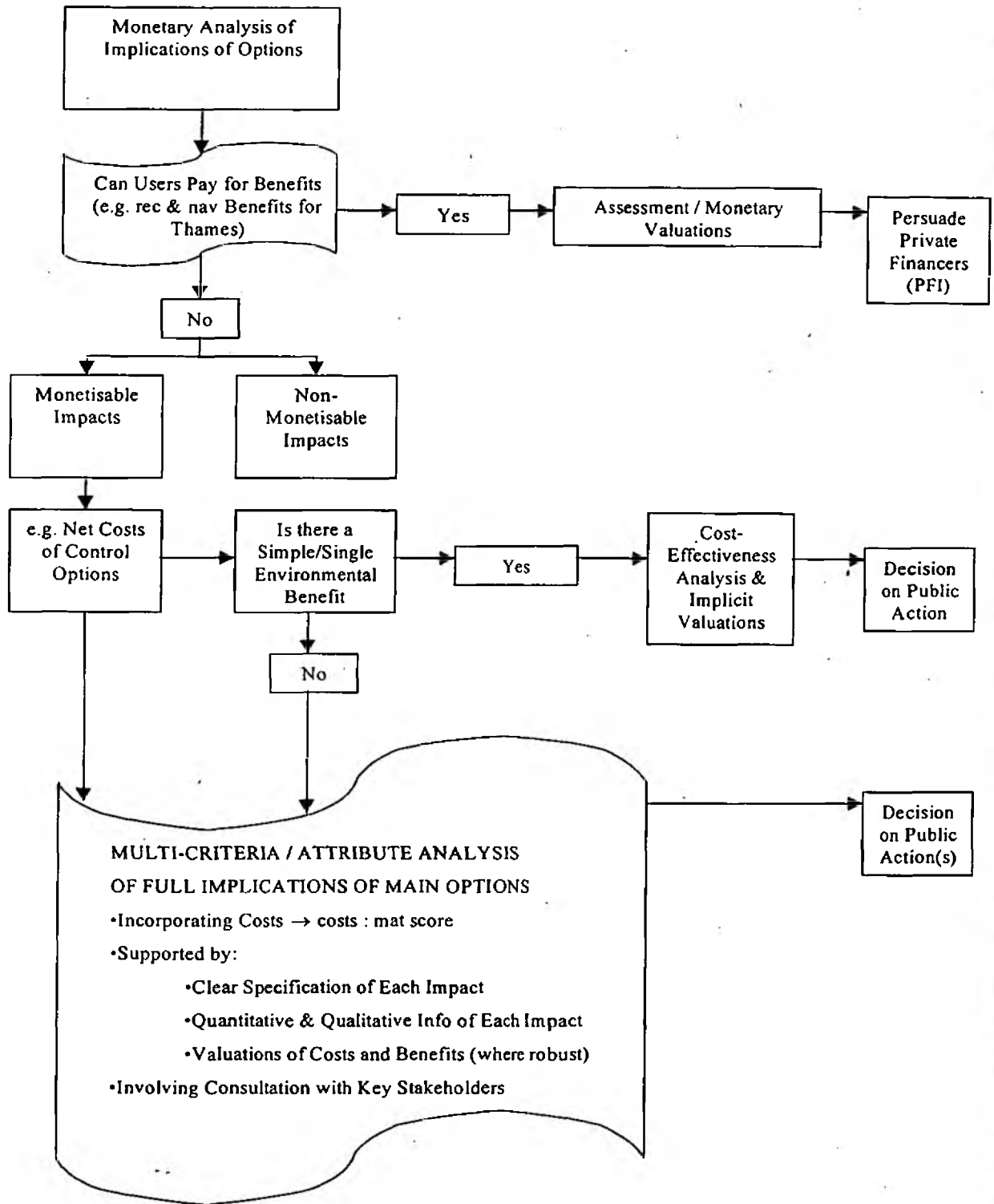
**Table 2: Indicative Criteria for Selecting Level of Economic Analysis Needed**

Level of Analysis	Agency Decision	
	Specific regulations and strategic/policy decisions	Projects (Expenditures)
<b>1 Simple proforma</b>	clear cut decision on best option	<£25k
<b>2 Fuller pro forma/ qualitative assessment</b>	variety of options with different costs and environmental impacts; but appraisal reveals best option	£25k-100k (Form A)
<b>3 Sophisticated quantitative/ qualitative analysis</b>	Contentious cases of regional significance Functions' strategic decisions	£100k - £500k (PID)
<b>4 Comprehensive analysis</b>	Complex contentious cases of supra-regional significance to the whole Agency and where outstanding conflicts (eg appeals to Secretary of State at DETR)	Exceptional cases of high risk or major national importance (PID plus higher level review by Directors or Board)

<sup>5</sup> The appraisal required for expenditures will need to conform to the requirements under the Scheme of Delegation. The level of the appraisals needed will vary depending on the complexity of types of expenditures. **Table 2** shows how the level of appraisals relate broadly to the form of appraisal needed (shown in () in the final column) for indicative expenditure bands for projects referred to in the Scheme of Delegation. we have a hierarchy of economic appraisals.

FIGURE 2: SELECTION OF APPROPRIATE ECONOMIC APPRAISAL TECHNIQUES





## 7.2 Selection of Appropriate Type of Economic Appraisal Techniques

There are a number of appraisal techniques that could be used for the substantive quantitative and qualitative assessments needed for levels 3 and 4 appraisals for contentious cases. These include Cost-Effectiveness Analysis (CEA), Cost-Benefit Analysis (CBA), Multi-Criteria Analysis (MCA) and Multi-Attribute Technique (MAT)<sup>6</sup>. This section explains the suitability of these techniques to aid managers select which of these appraisal techniques is appropriate (see **Figure 2**) and to help them to commission consultants to carry out analyses for such appraisals.

The relevance of a specific technique depends on the circumstances of each case. It is not a matter of any one technique being 'right' and the others being wrong, but rather which *combination of* techniques is most appropriate to help decision-makers in the Agency arrive at the best solution or decision for their case.

Key principles are that the selected technique must be:

- relevant to the Agency's objectives and duties;
- understandable to decision-makers in the Agency and to the external public;
- explicit, clear, transparent and auditable; and
- proportionate in terms of the time and resources available for carrying out the appraisal and the significance of the issue.

The Environment Agency's approach on economic appraisal is to assess **all** impacts encompassing **all** aspects and considerations regarding the options. This includes using monetary valuation of impacts *where the valuations are valid and robust* and presenting information on non-monetisable impacts and aspects so that decision-makers can determine their significance and consider them appropriately.

There are the following three criteria for selecting an appropriate appraisal technique:

- The extent to which there are many diverse impacts expressed in different units;
- The extent to which it is likely to be feasible to derive *valid and robust* monetary valuations for these impacts;
- The purpose of the decision-making process.

### Extent of Diversity of Environmental Impacts

**Figure 2** shows that where there is only one major non-monetised environmental impact and objective, then cost-effectiveness analysis should be used to assess the costs of options for achieving different levels of this environmental benefit.

However, many complex cases involve diverse impacts which are customarily presented in many different units. They may involve trade offs between options with greater environmental benefits but higher costs.

---

<sup>6</sup> Multi-Criteria Analysis (MCA) and Multi-Attribute Techniques (MAT) are used interchangeably in this guidance into refer to techniques for taking account systematically of many non-monetised impacts.

There may also be trade offs between the environmental impacts (eg recreation vs conservation). This presents an 'apples vs oranges' problem of aggregating and comparing these diverse impacts so that the decision-maker can select the appropriate option.

Monetary valuation techniques aim to aid decision-makers by assessing and presenting the diverse impacts in terms of a single common unit (money). Since the costs are mainly presented in monetary terms, this can facilitate comparison between the benefits of options and their costs. However, there are considerable limits on the extent to which robust monetary valuations can be readily obtained (see below).

### **Extent to Which Impacts can be Assessed in Monetary Terms**

The list below shows the main types of costs and benefits of the Agency's actions. As one goes down the list, it becomes harder to derive *valid and robust* monetary valuations that could be agreed by the main stakeholders:

- I. Costs of options;
- II. Impacts on marketable goods such as agricultural crops, timber, properties etc;
- III. Environmental services such as formal and informal recreation which individuals can fairly readily value in monetary terms although it can be difficult to estimate the numbers of people who would use the services;
- IV. Other less tangible impacts on human welfare that are not already included in categories (I-III) such as impacts on human health and aesthetic impacts of pollution or a degraded landscape;
- V. Impacts on ecological functions and biodiversity;
- VI. In addition, there can be specific aspects (eg equity) that are not (adequately) considered in monetary valuations.

In general, monetary valuation should be used where possible for categories 1-III above. Where these monetisable impacts constitute the major impacts and where there are no significant non-monetised impacts, then Cost-Benefit Analysis can be used to help select the best option which has the highest excess of benefits over costs.

**Figure 2** shows that where the Agency's investments in an environmental improvement scheme (eg, navigation and recreation) yields 'captureable' benefits (in category III above) that users can pay for through, for example, boating and mooring fees, fishing licences etc, then cost-benefit analysis and monetary valuations are needed. This could include market research to determine what consumers are willing to pay in practice for which service improvements. This would be needed to convince partners to provide private finance as part of a joint venture. The Agency may need to supplement this with a wider analysis of the other benefits of concern to the Agency.

It is unlikely to be feasible to obtain monetary valuations for many important intangible impacts on human welfare and ecological functions (categories IV and V), on which physical information and a qualitative assessment is needed to enable decision-makers to determine their significance.

While these environmental benefits are difficult to value in monetary terms, any decisions on them entails an *implicit* valuation of their importance. Therefore, it is essential to estimate the costs of obtaining these environmental benefits to indicate the *implicit valuations* given by decisions by Environment Agency and also other bodies concerning these benefits. These can then provide benchmark estimates against which to compare the costs of options to yield these environmental benefits in other cases.

The last category (VI) should be addressed by identifying separately the impacts on specific groups and indicating how any such effects might be mitigated (eg by compensating measures to offset impacts on welfare of particular groups or create elsewhere a displaced asset such as a woodland).

The choice between techniques depends in part on whether the intangible non-monetisable impacts (categories IV - VI) are considered to be significant.

Most of the Agency's contentious cases involve many important diverse intangible environmental impacts for which robust monetary valuations are not readily available. These cases require a broader decision-criteria than just monetised benefits exceeding costs. Therefore, in these highly contentious cases, **Figure 2** shows that it may be necessary to apply some form of Multi-Criteria Analysis (MCA) encompassing not only the monetised costs and benefits but also the non-monetised impacts and aspects. The latter are usually described in physical terms (eg numbers of hospital admissions, premature deaths), supplemented by an indication of their nature and significance.

If it is possible to derive robust systems for scoring and weighting each impact, then this would enable the diverse impacts of each option to be summarised in terms of a single MCA or MAT score. This could then be compared with the (net) costs of the options to determine their relative cost-effectiveness. However, in some cases such as road building projects, it may be too contentious to derive robust weights for the impacts. Consequently, the new appraisal systems for roads projects just presents the decision-maker with qualitative assessments and quantitative information on the full impacts of each option.

**Figure 2** shows that the specification of the impact categories and attributes in any MCA must be based on a sound economic appraisal framework to prevent double counting or omission of any impacts. For example, the net costs to a developer of remediating a contaminated site should comprise the remediation costs less any benefits of the remediation to the developer in the form of increased value of the site.

**Figure 2** also shows that the estimates for any monetisable impacts should input into any MCA where they represent a clearly defined and separate impact category such as recreation benefits. However, in many cases the available monetary valuations (eg treatment costs for health impacts) represent only cover part of a category of benefits. Consequently, these monetary valuations should be included alongside the other quantitative and qualitative information on the impacts that is used to assess them and determine any scoring and weighting for the impacts in the MCA.

## **Purpose of the Decision-making Process**

If the purpose of the decision-making process is, for example, to assign priorities based on rankings of schemes in terms of just their environmental benefits, then the Multi-Attribute Technique (MAT) may be appropriate. Thus the Agency used the MAT to assess systematically and as objectively as possible the various types of environmental benefits for all 900 schemes in the different areas or regions.

Where projects are funded by public expenditures from Central Government (eg for flood defence), the Agency has to appraise rigorously and consistently in monetary terms the costs and benefits of all projects in each region to ensure that the proposed projects are worthwhile compared with competing public expenditures. Such appraisals should also highlight the non-monetised impacts and aspects.

Monetary valuations of the level and significance environmental damage costs caused by a pollution incident (eg Sea Empress) may also be needed as part of the case for a fine or compensation payments.



**Annex I: Economic Support Services in the Agency**

Person	Title	Location	Responsibilities
Ronan Palmer	Chief Economist	Head office, Bristol	Overall policies and advice on economics in the Agency
Jonathan Fisher	Environmental economist	National Centre for Risk Analysis and Options Appraisal, Steelhouse, London	Develop economic appraisal techniques and their dissemination throughout the Agency; Valuation of environmental benefits; Support for water resources, water quality and recreation
Vicky Pollard	Business economist	National Centre for Risk Analysis and Options Appraisal, Steelhouse, London	Estimation of costs of environmental protection measures and impacts on business; support for Pollution Industry Regulation (PIR) and wastes
Frazer Smith	Regional economist	Thames Region, Reading	Application of economic appraisal throughout Thames region
Mark Tallintire	Regional economist and business analyst	North-East Region, Leeds	Application of economic appraisal throughout North East region
Nick Berry	Corporate planner	Southern Region	Business planning, performance management, efficiency planning, and application of economic appraisal in Southern region
Joanne Sherwood	Business analyst and economic contact point	Water Resources, Head office (Bristol)	Development and application of appropriate economic appraisal for water resources function
Ashley Holt	Policy advisor and economic contact point	Water Quality, Head office (Bristol)	Development and application of appropriate economic appraisal for water Quality function

## **Annex II Level of Economic Analysis Needed for Different Types of Decisions**

### **Level 1: Simple record**

#### **Regulatory Decisions**

The Agency's field officers should just complete a simple qualitative pro forma, where the options is clearly worthwhile or there is a clear cut preferred options with no significant costs or impacts or where there is little difference between the options' likely costs and benefits. For example, this might include where the Agency has to meet a statutory standard and the option is the most cost-effective means of doing so.

The simple proforma would provide an auditable record of the reasons for the decision. In addition, it would indicate whether the selected option entails any risks for the Agency and hence whether further economic analysis is needed - in which case a fuller qualitative level 2 pro forma would be needed. Such simple and fuller qualitative pro formas have been developed and efficiently applied for water resource abstraction licensing.

### **Level 2: Qualitative Assessment**

#### **Regulatory Decisions**

Level 2 applies where there are a variety of options with significantly different costs and environmental benefits. The Agency's officers should complete a more detailed pro forma giving clear qualitative statements describing the nature and level of the implications of the options and their causes and the risks or likelihood of these impacts arising. The impact categories could include: environmental impacts; costs of the controls for the applicant/business; wider economic impacts and any social impacts on the local community. These pro formas would provide an auditable record showing which options were considered and why the favoured option was selected and others rejected. This could be referred to in the event of there being appeals or disputes.

The appraisal should focus on the critical factors that determine the level and significance of the impacts. It may be necessary to seek alternatives that reduce the environmental impacts and the costs of controls to arrive at the best option. If, however, there are still disputes concerning the costs or environmental impacts of the outstanding options, then further quantitative appraisal would be needed (see level 3).

#### **Projects**

In respect of projects with expenditures between £25k - 100k, a level 2 appraisal would be broadly equivalent to the completion of a Form A quantifying the costs and giving a qualitative assessment of the benefits and risks.

### **Level 3: Quantitative and Qualitative Analysis**

#### **Regulatory Decisions**

Level 3 analysis will comprise a combination of quantitative and qualitative analysis of the full environmental and economic impacts. The regional economists or economic contacts in the functions could assist the functions to carry out these appraisals or to commission consultants to carry out the more complex analyses.

#### **Projects**

In respect of projects with expenditures between £100k - £500k, level 3 would comprise a quantification of costs and benefits (where feasible) and qualitative assessment of all other benefits and risks in the Project Initiation Document (PID).

### **Level 4: Comprehensive Quantitative and Qualitative Analysis**

Level 4 is applicable to particularly costly and contentious cases of national importance for the Agency. Level 4 analyses include a thorough and comprehensive analysis of the environmental and economic implications of the contentious options. It can include scrutiny of the costs of the options and comparing them with benchmark estimates of the costs of achieving the environmental benefits in question. The economists in the NCRAOA could provide economic advice to help the functions or regions to commission consultants to carry out the detailed economic analyses in these cases. This could include scoping studies to identify where to focus research efforts.

# Memo



ENVIRONMENT  
AGENCY

---

To	Heads of Functions Rod Gall Howard Pearce	Our ref	JF/econappraisal/guidance/memocov
From	Jimi Irwin	Your ref	
Ext Number	6893	Date	19 August 1999

---

**Re: Guidance on Economic Appraisal in the Agency**

I attach guidance on economic appraisal in the Agency. This is designed to inform senior managers on:

- The requirement to carry out an economic appraisal because of the legal duties under Sections 4 and 39 of the 1995 Environment Act and the need to allocate and use Agency's limited resources efficiently (**Section 2**);
- The services which could be drawn on to carry out economic appraisals (**Section 4**);
- How to select the level and type of economic appraisal that is appropriate for particular circumstances so as to facilitate commissioning such appraisals. It also explains the key elements of such appraisals and sets out the Agency's present approach to important aspects of economic appraisal, such as monetary valuation (**Sections 6 and 7**).

This guidance is part of a compendium of appraisal techniques that we are developing. We are also preparing guidance on how to link economic appraisal with other aspects of integrated appraisals such as environmental assessment and public consultation.

We intend that the attached guidance on economic appraisal could provide a basis for specific guidance tailored to the needs of individual functions. For example, in close liaison with Ronan Palmer, we are currently preparing tailored guidance on economic appraisal for water resources, PIR inspectors and estates management. The NCRAOA is also working with the National Groundwater and Contaminated Land Centre, which is commissioning operational guidance on economic appraisal for the remediation of contaminated land and groundwater.

To discuss how you would like guidance on economic appraisal tailored for your own function or particular areas of work, please contact Jonathan Fisher (Environmental Economist, - tel 7 10 6893) or Vicky Pollard (Business Economist, - tel 7 10 6703).

*J. J. Irwin*

**Dr Jimi Irwin**

**Head, National Centre for Risk Analysis and Options Appraisal**

National Centre for Risk Analysis and Options Appraisal

Environment Agency, Steel House, 11 Tothill Street, London, SW1H 9NF

Tel: 0171 6646893 Fax: 0171 6646911

jonathan.fisher@environment-agency.gov.uk

Enclosure: Guidance on economic appraisal

Cc (+ guidance):

Jan Pentreath (memo only)  
NCRAOA – Team heads (memo only)  
OATeam

Ronan Palmer  
Joanne Sherwood  
Ashley Holt  
Frazer Smith  
Mark Talantire  
Nick Berry  
Tim Webb  
Guy Mawle  
Phil Hickley  
Nigel Milner  
Peter Herbertson  
Jim Wharfe  
Teresa Kearney  
Jonathan Smith  
John Maynard  
Colin Candish  
Richard Horrocks  
Mark Hagger  
Heidi Rhodes  
Beverley Nash  
Melissa Somerville

**National Centre for Risk Analysis and Options Appraisal**  
Environment Agency, Steel House, 11 Tothill Street, London, SW1H 9NF  
Tel: 0171 6646893 Fax: 0171 6646911  
[jonathan.fisher@environment-agency.gov.uk](mailto:jonathan.fisher@environment-agency.gov.uk)