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(ETEU)**

ENVIRONMENTAL VALUATION

A Worldwide Compendium of Case Studies

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INTRODUCTION

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BACKGROUND

This compendium is the product of several years' collaborative work by researchers in a wide range of developing countries and countries in transition (CITs), facilitated and coordinated by the Economics, Trade and Environment Unit of the United Nations Environment Programme (UNEP). In 1993 UNEP commissioned the Centre for Social and Economic Research of the Global Environment (CSERGE) to prepare a collection of valuation methodologies and studies in developing countries. The following year, UNEP convened a consultative expert group meeting on the valuation of environmental and natural resources, to review the existing methodologies and applications, and then held follow-up workshops with institutions from Africa, Asia, Eastern and Central Europe, and Latin America.

From these discussion and reviews of the use of valuation methods, it was concluded that the extensive literature on the subject included few examples of their application in developing countries and CITs. It was therefore decided to produce a compendium of case studies to show the possibilities and practicalities associated with using valuation methods in these countries. Research institutions were chosen from each of the four regions – Africa, Asia, Eastern and Central Europe, and Latin America – to help coordinate the selection and production of the case studies. Several rounds of discussion meetings and workshops brought together the regional coordinators to develop a consistent approach and ensure that the cases covered a range of different applications.¹ A paper by Kuik et al. (1990) provided the initial framework for the analyses, which was then adapted in the course of the work. Most of the papers were drafted between 1995 and 1996 and reviewed during 1996 and 1997. A companion compendium on the use of *economic instruments* in developing countries and CITs is also available (Abaza and Rietbergen-McCracken, 1998).

OBJECTIVE AND AUDIENCE

This compendium is intended to serve three main purposes:

- to present evidence of the feasibility of using valuation methods in developing countries and CITs;
- to provide practical guidance on the particular issues that need to be addressed in using valuation methods in these countries; and
- to give researchers in developing countries and CITs the opportunity, by authoring the papers, to present their own critiques of the application described.

Up until recently, there was considerable skepticism, particularly among international development organizations and developing country governments (as end users of the valuation results) about the possibilities of using valuation methods outside the relatively research-rich and data-rich environments of developed countries. It was generally felt that developing countries and CITs presented too many difficulties (including a scarcity of statistical information; the presence of price distortions or undeveloped markets; and in some cases largely illiterate communities) to allow valuation methods to produce meaningful results. However, over the last five to ten years, a growing body of evidence has

¹ Contact information for the regional coordinators is provided at the end of this chapter.

emerged to refute these claims and this compendium will hopefully contribute to the realization that applying valuation methods in developing countries and CITs has much to offer, not only to international development institutions, but also to policy makers in the countries concerned.

Another trend that has been seen up until recently, and one that applies to the field of environmental economics as a whole, has been the dominance of western academics in the literature. Researchers from developing countries and CITs have had relatively few opportunities to present their views and perspectives to an international audience.² By involving research institutions from within the four regions, UNEP has purposely tried to correct this imbalance, while at the same time encouraging networking between the different institutions.

The main audience for this book comprises economists in developing countries and CITs, who are looking for practical descriptions of and guidance on how valuation methods can be applied in their countries. The cases will also provide useful material for researchers and university lecturers in the fields of environmental economics and environmental policy. As something of a 'how to' case book, the compendium is intended to provide training material. The cases therefore go beyond descriptions of the valuation methods used, to include critical analyses, suggestions on alternative methodologies and other possible applications, and references to other studies and the theoretical literature.

Policy makers in developing countries and international and national development agency staff may also have an interest in the empirical evidence presented by the cases, as they consider the potential applications of such methods in their own spheres of influence. Finally, readers without formal training in economics should not feel unwelcome. The book has also been written with them in mind, and this introductory chapter and the extensive glossary should help them make their way through (or round) the economics involved.

SCOPE

In selecting the cases to be included in this collection, the coordinators tried to ensure that all major valuation methods were covered and a range of applications represented.³ The following valuation methods are included (the numbers in parentheses refer to the number of cases in which they are described):

- Loss of Income and/or Production (7)
- Contingent Valuation Method (6)
- Travel Cost Method (4)
- Replacement/Reproduction Cost Method (4)
- Benefit Transfers (4)
- Mitigation Cost Avoided (2)
- Opportunity Cost Approach (2)
- Discounted Income Method (1)
- Damage Cost Avoided (1)
- Hedonic Property Pricing (1)

Table 1 lists the valuation methods described in the cases and the particular environmental issues addressed. In most instances, the cases review previous valuation studies taken from the literature.

² Georgiou et al. (1997) explain the dominance of North American and European economists in the field of valuation as a reflection of the lack of environmental economics education in developing country universities, and the lack of training for agency and government staff.

³ The regional coordinators included: Hugo van Zyl, Thomas Store and Anthony Leiman (Africa); Marian delos Angeles (Asia); Edgar Furst, David Barton and Gerardo Jimenez (Latin America and the Caribbean); and Pavel Kasianov and Renat A. Perelet (Eastern and Central Europe).

TABLE 1. Valuation Methods Included in the Compendium

<i>COUNTRY</i>	<i>ENVIRONMENTAL ISSUE</i>	<i>VALUATION METHODS OR COMPONENTS</i>
AFRICA		
Kenya	Value of time spent collecting water	Revealed preference approach (application of discrete choice theory); Random utility theory approach
Kenya	Value of wildlife viewing	Travel Cost Method; Contingent Valuation Method;
Ghana	Determination of land values in Accra	Hedonic Pricing Method
Cameroon	Costs of rainforest conservation	Costs of forgone benefits from commercial logging and hunting; Benefits from tourism, fisheries protection, flood control, and soil fertility maintenance
ASIA		
Philippines	Profitability of forest plantations	Replacement cost method; Change in productivity method; Loss of earnings method; Shadow project method
Taiwan	Air pollution and health	Contingent Valuation Method
Sri Lanka	Environmental impacts of highway construction	Loss of productivity of fisheries and agriculture; Loss of non-agricultural land and buildings; Costs of noise, air, and water pollution
EASTERN AND CENTRAL EUROPE		
Poland	Air pollution-related damages to forests	Loss of productivity; Losses from premature felling; Reconstruction costs; Loss of non-productive uses
Estonia	Environmental problems of oil shale extraction	Costs of land reclamation; Costs of compensation payments; Reproduction costs of (polluted) water resources
Russian Federation	Forest parks in the Moscow region	Reproduction cost method; Discounted income method; Travel Cost Method
LATIN AMERICA AND CARIBBEAN		
Chile	Air pollution control in Santiago	Human capital approach; Mitigation cost approach
Netherlands Antilles	Reef conservation	Loss of income method; Contingent Valuation Method; Costs of protection
Haiti	Water services	Contingent valuation method
Mexico	Forest valuation	Damage costs avoided; Mitigation costs avoided; Loss of production avoided; Contingent Valuation Method; Travel Cost Method
Nicaragua	Valuation of mangroves	Loss of income method Change in productivity method Contingent Valuation Method; Travel expenditure method

Quite a few of these studies represent first-time attempts at valuing a particular resource, or using a particular combination of valuation methods, in the regions concerned. Other cases, for example those from Eastern and Central Europe, present original work by the authors, or propose the use of particular valuation methods to address the shortcomings of more traditional approaches to valuation. Most of the studies provide results of direct relevance to policy makers, for example in decisions on price setting, development planning, or pollution control.

Applying Valuation Methods in Developing Countries and Countries in Transition

While the cases describe a wide range of different applications, they revealed some common issues. The following is a summary of the most common issues that emerged, including those related to the valuation *methodologies*, and those related to the socio-economic and political *context* of the valuations (there is, of course, considerable overlap between these two sets of issues).⁴

Methodological Issues

A tabular summary of the strengths and weaknesses of some of the main methods is provided in Table 2. For more information on the pros and cons of the various valuation methods, interested readers are referred to the growing body of literature on this subject, including Georgiou et al. (1997), Pearce and Moran (1994) and Pearce and Turner (1990). Each of the main valuation methods are described briefly in the glossary in this compendium.

A few of the lessons learned regarding the use of specific valuation methodologies are presented in Table 3. By and large, the kinds of *common* methodological issues that appeared across the different studies relate to either the *inputs* (i.e. the availability and quality of information) or the *outputs* (i.e. the quality of the estimates produced) of the valuation methods used.

Data Availability

The majority of the valuation studies explicitly mention limitations imposed by the lack of available data, for example, time-series data on resource use or productivity, or socio-economic statistics on visitors to natural resource amenities. This lack of information can result in one or more of the following: (i) the valuation relying on rough approximations rather than accurate data; (ii) the valuation being based on a set of simplified assumptions; and (iii) uncertainty as to whether the sample surveyed (e.g. of visitors to national parks) is representative of the population (of visitors) as a whole. Another possible consequence of the unavailability of data – in this case, specifically data on the benefits provided by particular resources – is the need to use ‘off-the-shelf’ values from other locations or countries, where these kinds of data are more available. This issue of ‘benefit transfer’ is discussed below.⁵ The scarcity of statistical and market data also tends to favour the use of those valuation methods that employ primary data collection rather than secondary data sources. This, according to Georgiou et al. (1997), may explain the evident success of contingent valuation, discrete choice, and travel cost techniques (all of which are based on surveys) in developing countries.

⁴ The following synthesis draws on the analytical work of the following regional coordinators: Hugo van Zyl, Thomas Store and Anthony Leiman (Africa); Edgar Furst, David Barton and Gerardo Jimenez (Latin America and the Caribbean); and Pavel Kasianov and Renat A. Perelet (Eastern and Central Europe).

⁵ See glossary for explanation of the term ‘benefit transfer’.

TABLE 2. Strengths and Weaknesses of Some Valuation Methods and Approaches

<i>Valuation Method / Approach</i>	<i>Strengths</i>	<i>Weaknesses / Limitations</i>
Market prices	Market/shadow prices are usually the best estimate of WTP; Market prices reflect stakeholders' decision-making reality (they are the prices faced when making decisions).	Market and policy failure mean that shadow prices need calculating to find WTP; Prices underestimate true value since they don't include consumer surplus; Prices vary by season, so averages mislead; Care is needed over the assumption that output will not affect price (elasticity of supply).
Replacement Cost and Preventative Expenditure	Relatively easy to calculate (sometimes based on observed behaviour) and useful as a second-best estimate.	Difficult to establish if people really would be prepared to incur costs of secure benefits in 'without project' situation; Difficult to establish if net benefits of prevention or replacement would be same as the 'with project' intervention.
Proxy / Substitute Products	Relatively easy to collect data.	Proxies are rarely perfect substitutes; Same limitations as market prices.
Change in Productivity	If data exists, easily understood by decision makers.	Quantitative input-output data needed on physical relationships; Difficulty of isolating cause and effect.
Opportunity Cost	Useful for subsistence production with high labour requirements, and one land use precluding another.	Only useful for gross value, since the product is effectively valued by its cost, and labour opportunity cost can be difficult and costly to value properly.
Travel Cost Method	Useful for recreational facilities and eco-tourism; More accurate when travel distances are short.	Assumptions required to develop demand curve (e.g. whether travel is uni- or multi-purpose); Estimated parameters and benefits highly sensitive to opportunity cost of time estimates; Data intensive and complex/costly.
Hedonic Pricing	Has potential in high-income or semi-urban areas.	Relies on highly developed property markets; Difficult to isolate the explanatory variable.
Contingent Valuation Method	Reliable if strict procedures followed and pre-testing done; Only method available for non-use values; Includes consumer surplus; Gives net value, so no need to deduct costs.	People find it difficult to separate environmental from wider values (embedding problem); Biases; Credibility problems; Low income as a constraint on WPT or WTA; Ethical issues, especially in low-income countries.

Source: Adapted from Davies and Richards (1998).

Cost Considerations versus Credibility

While a number of the studies were commissioned and supported by international organizations (for instance, three of the cases from Latin America and the Caribbean were based on World Bank-supported valuation work), many others did not benefit from outside financial assistance, and had to operate on quite tight budgets. This directly affected the way in which the methodologies were applied. Cost considerations tended to decrease the time which could be spent on the studies (particularly the field work); reduce the sample sizes; and preclude the use of more sophisticated techniques. All of these

impacts in turn influenced the quality of the results and their potential credibility with policy makers. In noting this problem, van Zyl, Store and Leiman (1996) recommend that valuation studies start with a careful analysis of the feasibility of adequately applying the proposed techniques, to help achieve the best results possible. In some cases, they say, it may be wiser to increase sample sizes instead of producing estimates that are not reliable anyway and represent a waste of resources.

TABLE 3. Some Lessons Learned re. Valuation Methodologies⁶

Contingent Valuation Method

- when CVM studies are used for policy purposes, it is useful to have some form of validity test;
- CVM studies must address bias problems explicitly;
- although cost considerations are always important in valuation studies, samples must be of a significant size for the generation of reliable estimates, particularly if the results are to be used for policy purposes;
- pre-test and pilot surveys can help to enhance the reliability and validity of the study;
- caution must be exercised when using WTA question formats, to ensure they are phrased appropriately;
- WTA formats may produce unreliable results, which represent an opportunity cost – more comprehensive and reliable results may be produced if complementary elicitation methods are used together.

Source: van Zyl, Store, and Leiman, “The Recreational Value of Viewing Wildlife in Kenya.”

Travel Cost Method

- when valuing amenities that are used by both foreigners and residents, two separate demand functions should be estimated;
- both zonal and individual observations should be used, to determine which gives more reliable estimates;
- researchers should be careful in the definition of travel costs, travel time, and on-site time costs;
- comprehensive statistical analysis should be undertaken for the selection of the best functional form.

Source: van Zyl, Store, and Leiman, “The Recreational Value of Viewing Wildlife in Kenya.”

Hedonic Pricing Method

- variables used in the analysis should reflect the sociological and cultural circumstances of the residents;
- a broad spectrum of variables should be included to improve accuracy and comprehensiveness;
- the choice of functional form used in regression analysis should be explicitly validated;
- special treatment must be given to unusual circumstances (including political changes) that affect the property market.

Source: van Zyl, Store, and Leiman, “Determinants of Land Values in Accra, Ghana.”

Accuracy and Reliability of Results

Data scarcity also affects the level of accuracy of the valuation estimates. This however is not necessarily a problem, depending on the purpose of the study. Obviously, if the valuation is intended to provide an estimate that will be used, for example, to set user fees for parks or determine acceptable levels of resource use, then accuracy is important. However, several cases describe studies that were designed to provide order-of-magnitude estimates, for more general policy purposes. This was the case in the study by Fallon Scura and van’t Hof (1993) (reviewed by Furst *et al.*), which valued the costs and benefits of reef conservation on a small Caribbean island. The study was intended to address questions such as “Are protection and tourism compatible?” and “Are there physical limits on the multiple uses of protected

⁶ See glossary for brief description of these valuation methods.

marine ecosystems?”. Given the relatively undiversified economy of the island, and the general kinds of questions to be addressed, the rough-and-ready nature of the study (necessitated by time and data constraints) was considered justified. By using a simplified version of contingent valuation and a ‘gross revenues and expenditures’ approach, the study was able to identify a threshold level of scuba dives per site per year, and to suggest an upward adjustment of the modest entrance fee for the marine park. These very useful findings probably would not have required a more exact valuation approach.

Another ‘order-of-magnitude’ study, by Pearce et al. (1993) (reviewed by *Furst et al.*), attempted to calculate the Total Economic Value of forests in Mexico. The level of aggregation this required and the very mixed quality of the little data that was available meant that the final estimate was inaccurate and unreliable, and therefore considered of little use except for general awareness-raising purposes. Indeed, *Furst et al.* raise the question “Is an inaccurate monetary value more useful than the alternative of no value at all?” and suggest that such a generalized approach to valuation may provide few applied policy guidelines that may not otherwise be deduced from environmental economics theory.

The review by *delos Angeles et al.* of an evaluation study of forest plantations in the Philippines (by Niskanen, 1995), outlines the steps that were taken to increase the reliability of the estimates, given the major inaccuracies in the methodology. Firstly, the study report clearly describes the methodology used and all the assumptions made. Secondly, the study uses conservative figures in key economic data such as yield and prices, so as not to overemphasize the impacts of plantation forestry. Thirdly, the study conducted a sensitivity analysis for all the types of cost-benefit analysis performed.

Several studies attempted to increase the reliability of the valuation estimates by using two different methods and comparing the convergence of the results obtained. However, as cited in a number of cases, Mitchell and Carson (1989) have pointed out that a convergent validation only contributes to the credibility of the results and does not prove the accuracy of either of the methods used.

Discounting

One of the most contentious issues in valuation methodology, discounting refers to the common practice of lowering the value of a resource (and its use) over time – in other words, ‘preferring’ present use over future use. Discounting using market interest rates, many environmentalists (and some environmental economists) argue, has a built-in bias against future generations and makes unsustainable exploitation seem preferable, in economic terms, to sustainable use. Thus, they say, market discount rates need to be adjusted downwards to social rates, to incorporate the interests of future generations. Others (such as Pearce et al., 1989) argue that this would be difficult to achieve, both in methodological and administrative terms, and that, in any cases, the lower rate would tend to favour development projects, thus increasing the demand for natural resources. Pearce et al. therefore recommend that, instead of lowering the discount rate, efforts should be concentrated on, *inter alia*, improving the actual valuation techniques, to better value future costs and benefits.

Several cases raise concerns about the practice of discounting. *Kjabbi*, in her paper on the valuation of oil shale in Estonia, avoids discounting altogether, as she feels it is inappropriate in the economic context of former Soviet Union countries. While others may contest her argument, she says it is impossible to substantiate the application of any discount rate, because of problems associated with inflation and the economic stagnation common in these countries. Further, she argues that the increasing scarcity of natural resources means that the future values of these disappearing resources will *increase*.

Other papers take issue, not with the fact that the original studies used discounting, but with the choice of the actual discount rate applied. In a few instances, the rate seems to have been plucked from the air, and no justification given for the selection. In two cases, discount rates were chosen according to the rates used by the World Bank in its financing of two development projects (see the study by Windevoxhel (1992), reviewed by *Furst et al.* and the study by Niskanen, reviewed by *delos Angeles et al.*). As several reviewers point out, the discount rate chosen is often the main determinant of the valuation results and the associated recommendations. For example, the valuation of costs of rainforest conservation in Cameroon (by Ruitenbeek, 1991, reviewed by *van Zyl et al.*) sought to determine the amount of international transfer

needed to compensate Cameroon for the costs involved. Using a discount rate of 8%, the study found that a transfer of 3,605 million CFAF would be necessary.⁷ However, if the discount rate were lowered to 6%, the result would be quite different. Indeed, no transfer would be necessary and the conservation of the rainforest would actually yield a Net Present Value of 319 CFAF.

To increase credibility, valuation studies that use discount rates should therefore include a sensitivity analysis for the discount rate, and the report should make explicit the assumptions and limitations of the rate chosen. However, discounting is likely to remain a contentious issue for some time, as Georgiou et al. (1997) admit: “The discount rate problem remains and none of the recent developments in the literature will assist the analyst in resolving the problem in any clear-cut fashion.”

Benefit Transfers

The use of benefit transfers – that is, the transfer of benefit estimates or benefit functions from another location or country to the site being valued – is sometimes seen as a ‘necessary evil’, though others (including Georgiou et al., 1997) see it in a more positive light, as a potentially useful and low-cost alternative to conducting full-blown valuation studies in developing countries.⁸ What is clear is that the use of benefit transfers needs to be accompanied by a validation analysis to test the applicability of the outside values to the situation at hand.

CONTEXTUAL ISSUES

A few general comments can be made about the way in which the prevailing socio-economic situation can influence the valuation methodology, and the potential applicability of the valuation results by policy makers.

*Market Failure*⁹

The countries in which the valuation studies were conducted represented, especially at that time, an enormous range of socio-economic and political conditions. They ranged from Nicaragua (emerging from a civil war) to Taiwan and Chile (both rapidly growing economic ‘tigers’) to Poland, Estonia and Russia (undergoing transition and suffering economic recession). Despite the huge influence which market failure (as well as government failure) has on valuation results, relatively few of the studies addressed this issue directly. Ignoring such market distortions in the valuation work can make the results meaningless.

Some cases in the compendium do make mention of the existence of market distortions, due to the situations of high inflation, high interest rates, or centrally-administered prices, pointing out the effect this may have on the results. For example, the study by Windevoxhel (1992) (reviewed by *Furst et al.*) recognized labour market distortions, due to long-term and seasonal unemployment, and corrected the market wage rates accordingly. Once study, by Asabere (1981) (reviewed by *van Zyl et al.*), went further and attempted to measure the significance of the effect of market distortions. The hedonic pricing technique used in this study of the urban land market in Accra, Ghana, included variables for several factors thought to have potential distorting effects. Indeed, the regression results revealed *legislative* market distortions, from government zoning practices and rent controls, and *socio-political* distortions, from traditional land tenure systems and ethnic clustering. The analysis also examined the land market over several time periods, to capture the potential impact of the artificial price suppression that was experienced for several years under the rule of a military dictatorship.

⁷ At the time of the study, one US dollar equaled approximately 250 CFAF (the Central African Francs).

⁸ A recent initiative by Environment Canada seeks to make available an inventory of benefit values of biodiversity from a large number of valuation studies around the world, to facilitate the use of benefit transfer. See Filion et al., 1998.

⁹ Market failure is defined here as the failure of markets to reflect the full social costs of production in the price of traded products and inputs. Government failure (sometimes called ‘policy failure’) refers to the policy interventions by governments that produce less efficient outcomes than if the markets were allowed to allocate resources. These inefficient interventions may include subsidies, price controls, ownership controls, etc. See Pearce and Warford, 1993 for more details on both market and government failure.

Reflecting on the distortions in the Haitian economy during the early 1980s, *Furst et al.* suggest that direct surveys of resource user WTP may be more reliable than methods that rely on the observation of very distorted market prices. A similar comment is made by Georgiou et al. (1997), who cite market distortions as the reason why valuation methods such as the hedonic property and hedonic wage pricing techniques are the least common types of valuation in developing countries. However, they qualify this remark by pointing out that there *is* scope for applying these techniques in developing countries, especially for land values, where markets often work well. The relative advantages of survey-based techniques under market distortions are even stronger when statistical and market data are not readily available, as mentioned earlier. These advantages are partly offset by a number of limitations of these approaches, notably the higher risk of non-random error, including various biases.¹⁰

Distributional Issues

In countries with highly skewed income distributions, valuation studies should ideally take distributional issues into account in two ways. Firstly, the existing distribution patterns should be considered, and if necessary incorporated, in the valuation process, to make the results more meaningful. Secondly, the studies' recommendations would need to include forecasts of how the policies proposed could have different impacts on different income groups.

There are surprisingly few examples of either of these considerations in the studies reviewed in this book. Two studies did calculate the social shadow price of labour, in one case (Niskanen, 1995) to reflect society's marginal WTP for non-educated labourers, in the other case (Windevoxhel, 1992) to take into account the high level of unemployment, as mentioned above. In addition, the Contingent Valuation Method (CVM) and Travel Cost Method (TCM) study on the value of wildlife viewing in Kenya, by Navrud and Mungatana (1994) (reviewed by *van Zyl et al.*) differentiated between residents' and non-residents' WTP and the elasticities of their demand for recreation, thereby incorporating, at least implicitly, some distributional consideration.

However, most cases either ignore distributional issues completely, or mention them without incorporating them into the analysis, as is the case with the study on air pollution in Santiago, Chile, by Eskeland (1994) (reviewed by *Furst et al.*). The report of this study drew attention to the fact that air pollution may disproportionately affect the poor, yet the valuation used a single minimum wage to value the loss of productive labour to the economy, due to the health-impacts of pollution.

The only study that makes explicit mention of the possible impact of its policy recommendations on particular groups in society is the valuation of time spent collecting water in a Kenyan town, by Whittington et al. (1990). This study found that households' preferences for the three main water sources available (i.e., buying water from kiosks, or vendors, or getting water from open wells) were significantly influenced by the total income of the households and the number of adult women in the households – both distributional issues. And, in considering the possible implications of replacing vending and/or kiosk systems with piped water systems, the review by *van Zyl et al.* highlights the distributional trade-off that would result, from the removal of the employment opportunities that the former two systems provide the local community.

Applicability of Results

While the vast majority of the studies provided results that could be used by policy makers, relatively few actually provided detailed proposals on how the results could be applied in practice. This kind of information is key, if policy makers are to become convinced about the credibility and applicability of valuation results. As *Furst et al.* (1996) point out, it was only recently that valuation methods gained a wider acceptance outside of the western academic community. The challenge now is to show their

¹⁰ Discussions of the different forms of bias in the Contingent Valuation Method are found in the reviews by *Furst et al.* (Haiti) and *van Zyl et al.* (in their paper on wildlife viewing in Kenya), and a brief description of the main biases is given in the glossary.

relevance to governments in developing countries and CITs, and this will require a good deal of ‘hard evidence’ in the form of cases where valuation results provided immediately useful information for policy makers.

A good example from this compendium is the study by Navrud and Mungatana (1994) (reviewed by *van Zyl et al.*) of the value of viewing wildlife in a national park in Kenya. The fact that the Kenya Wildlife Service used the pricing estimates obtained from this study to increase the entrance fees for non-residents by 310% illustrates the applicability of the Travel Cost and Contingent Valuation methods used. Another study that paid attention to the applicability of the results was that by Fallon Scura and van’t Hof (1993) (reviewed by *Furst et al.*). In valuing the costs and benefits of reef conservation on the Caribbean island of Bonaire, the researchers made very practical suggestions on how best to avoid damage from the high visitation rates. The authors of the study report were aware that the cooperation of an important group of stakeholders – the diving holiday operators – was vital to the successful implementation of the recommended policies. They therefore recommended, alongside the imposition of a limit on the number of visits and/or higher park user fees, the introduction of incentives to increase the local economy multipliers, to increase the benefits to the tourism-dependent sectors on the island.

Van Zyl, Store and Leiman (1996) suggest that, for valuation studies that are to be used for policy decisions, post-study evaluations be carried out, to assess the application of the results. This, they say, would serve to identify any problems in the practical implementation of policies based on valuations, and enhance the credibility of valuation methodologies.

TOP-DOWN VERSUS PARTICIPATORY VALUATION APPROACHES

An issue dealt with in most of the critiques of the studies from Latin America and the Caribbean is the contrast between Cost-Benefit Analysis (CBA) – seen as ‘top-down’ – and other more participatory valuation methods, such as Multi-Criteria Analysis (MCA).¹¹ MCA can take into account the preferences of multiple stakeholders and the trade-offs between, for example, conservation and development. This method is therefore particularly appropriate in the valuation of multiple use resources, such as forests, where an analysis of the interests of different stakeholder groups is an explicit objective.

The exclusive use of CBA in the valuation of mangroves in Nicaragua (by Windevoxhel (1992)) is questioned by *Furst et al.*, as the CBA was not able to consider the distribution of impacts of forestry policies on groups depending on the mangroves for their subsistence. Furthermore, *Furst et al.* point out that CBA does not provide a tool for revealing and resolving the complex conflicts of interest between users and government bodies responsible for the management of the mangroves. They therefore recommend the use of additional methodological approaches, such as MCA, to integrate the different preferences of stakeholders and to try and gain some consensus on the design of the most favourable management option.

These criticisms of CBA are reflective of a set of wider concerns about CBA, expressed by proponents of participatory methods. Davies and Richards (1998) list some of these concerns, including:

- the top-down analysis ignores the fact that different stakeholders value the same costs and benefits in different ways, according to their perspectives and objectives;
- the tendency of CBA to ascribe less weight to equity, livelihood and institutional issues, including resource access and control; and
- the lack of transparency makes it easy for economists to ‘massage’ the data or hide key assumptions in order to window-dress a pre-determined outcome.

However, in the cases where MCA is mentioned, this methodology is seen as a complement, not an alternative to the more traditional economic valuation methods. A single economic value of a resource,

¹¹ See glossary for a brief description of MCA.

produced for example by CBA, can be used as the basis for assessing different stakeholders' preferences on the economic, ecological, and social values of the resource. This can help provide a 'bottom-up' approach to decision-making, rather than, as CBA tends to do, centralizing the valuation in the hands of a few decision-makers.¹²

THE PARTICULAR CASE OF COUNTRIES IN TRANSITION

While many of the issues mentioned so far apply equally to developing countries and CITs, it is worth looking at a few particular characteristics of CITs that affect how valuation methods are being used in these countries. Kasianov and Perelet (1996), in their analysis of the cases from Eastern and Central Europe, list some of the problems facing former 'socialist' countries, and especially the former Soviet Union, which might limit the use and usefulness of valuation methods. These include economic and social problems, political instability, significant environmental problems, undeveloped market relations, and the lack of democratic traditions. On the other hand, as they say, these countries benefit from a strong scientific capability, the availability of natural resources, experience with state development planning (important for environmental regulation) and the predominantly state-ownership of natural resources, which makes it easier – at least in theory – to allocate natural resource property rights efficiently and to use market forces in their management.

In terms of the appropriateness of different valuation methods, Kasianov and Perelet consider the Reproduction Cost Method (RCM) preferable to methods based on WTP. This they say is important in former socialist countries, where environmental needs are given less priority than basic material needs. Thus, survey-based methods will tend to undervalue the natural resources in question, and valuation methods based on technical and data (such as the reproduction cost method) will be more likely to produce estimates nearer the true value of the resources. In contrast, they say, the higher environmental demand in more developed countries makes WTP a valid measurement there. They also cite two other problems with using WTP-based methods in former socialist countries. Firstly, these techniques presuppose well-developed markets and a 'market mentality', neither of which are yet fully established. Secondly, WTP techniques stress individual preferences in the poorly-understood and risk-prone field of the environment, where, Kasianov and Perelet propose, collective precautionary judgment may be more appropriate.

These views on the Reproduction Cost Method are reflected in the cases from Eastern and Central Europe, all three of which include the use of this method, alongside other valuation methods (as shown in Table 1). However, Kasianov and Perelet also point out one limitation of using RCM in these countries. That is, the fact that the actual prices (in the form of environmental charges or taxes) of natural resources are incomparable with the actual costs of their reproduction. Nonetheless, they report that efforts are now being made to use these techniques to reform, and where possible, raise the efficiency of the existing taxation system, to make these taxes better reflect the true value of the resources involved.¹³

¹² Davies and Richards (1998) discuss how participatory research methods are increasingly being combined with neo-classical economic methods, in the development of 'participatory economic analysis', in the context of participatory forest management. Other interesting examples of participatory valuation methodologies are found in IIED (1997) and Emerton (1996).

¹³ See the introductory chapter of Abaza and Rietbergen-McCracken (1998) for a discussion on the economic efficiency of environmental taxes and charges in developing countries and CITs.

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