

REVIEW OF METHODS FOR VALUE TRANSFER

1. WHY VALUE TRANSFER?

Increased use of Cost-benefit analysis (CBA) in the environment, transport and energy sectors have increased the demand from decision makers for information on the economic value of environmental goods. Policy uses of environmental values include: CBA of projects and policies, environmental costing to calculate the social optimal level of pollution (and optimal size of e.g. green taxes), green accounting at the national, community and firm level; and calculating compensation payments after a pollution accident, for example Natural Resource Damage Assessment (NRDA).

Due to limited time and resources when decisions have to be made, new environmental valuation studies often cannot be performed, and decision makers try to transfer economic estimates from previous studies (often termed *study sites*) of similar changes in environmental quality to value the environmental change at the *policy site*. This procedure is most often termed *benefit transfer*, but could also be transfer of *damage* estimates. Thus, a more general term would be value transfer.

Value transfer is now common in applied analysis, and the practitioner can refer to excellent guides that cover the practical steps and key aspects of conducting a value transfer (see especially Desvousges, Johnson and Banzhaf 1998 or Rosenberger and Loomis 2003). However, there remain important methodological questions about value transfer, and over the last five years there has been an increasing body of research advancing transfer methods and exploring the limits of for what types of environmental goods and in what situations environmental value transfer is valid and reliable. The purpose of this book is to assemble the latest research results and take stock of the state of the art in environmental value transfer, introduce new methods to advance the methodology, and to further the research agenda in this area.

Three important issues surrounding the practice of value transfer will be recurring themes in this book. First, how should value transfer be done? The case studies included in this book demonstrate several different value transfer methods. Second, how much additional uncertainty is introduced by value transfer, relative to the uncertainty that is inherent in all non-market value estimates? Here, we are interested in knowing both whether value transfer is valid in a statistical or theoretical sense, as well as in measuring the potential error that value transfer can introduce. Third, what level of additional uncertainty (or transfer error) is acceptable in a policy analysis? Here, no clear guidelines exist, but the level of precision in environmental values that is required in a policy analysis likely will differ from case to case.

2. VALUE TRANSFER METHODS

There are two main approaches to benefit transfer:

1. Unit Value Transfer
 - i) Simple Unit Transfer
 - ii) Unit Transfer with income adjustments
2. Function Transfer
 - i) Benefit Function from one study
 - ii) Meta analysis

Several classification of value transfer methods are used, for example unit value transfers is sometimes termed benefit value transfer or just value transfer, and all types of function transfer (including meta analysis) can be seen referred to as value function transfer. The main difference between the two main approaches is, however, always that the first one is based on a single point estimate or value range from a summary of studies, while the second approach transfers an estimated model describing how benefit measures (from one or more studies) change with the characteristics of the study population or the resource being valued.

2.1. Unit Value Transfer

Simple **unit transfer** is the easiest approach to transferring benefit estimates from one site to another. This approach assumes that the marginal value to an average individual at the study site from the environmental good is the same as that which will be enjoyed by the average individual at the policy site. Thus, we can directly transfer the mean willingness-to-pay (WTP) estimate from the study site to the policy site.

For the past few decades such a procedure has often been used in the United States to estimate the recreational benefits associated with multipurpose reservoir developments and forest management. The selection of these unit values could be based on estimates from only one or a few valuation studies considered to be close to the policy site, or based on mean values from literature reviews of existing values. Walsh, Johnson and McKean (1992, table 1) presents a summary of unit values of days spent in various recreational activities, obtained from 287 contingent valuation (CV) and travel cost (TC) studies.

The obvious problem with this transfer of unit values for recreational activities is that individuals at the policy site may not value recreational activities the same as the average individual at the study sites. There are two principal reasons for this difference. First, people at the policy site might be different from individuals at the study sites in terms of income, education, religion, ethnic group or other socio-economic characteristics that affect their demand for recreation. Second, even if individuals' preferences for recreation at the policy and study sites were the same, their recreational opportunities might not be.

Unit values for non-use values of for example ecosystems from CV studies might be even more difficult to transfer than recreational (use) values for at least two reasons. First, the unit of transfer is more difficult to define. While a common