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Valuing Environmental Impacts:
Practical Guidelines for the Use of Value Transfer in Policy and Project Appraisal

Annex 1 – Protocol for Primary Valuation Studies

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ANNEX 1: PROTOCOL FOR PRIMARY VALUATION STUDIES

- *The <u>protocol for primary valuation studies</u> is intended to aid future value transfer applications.*

- *It is aimed at <u>practitioners undertaking primary valuation studies</u> with the purpose of improving the evidence base available for value transfer in the future.*

- *The protocol is an <u>ideal checklist</u> which may not be completed fully by all primary studies depending on their purpose and scope.*

I. Purpose

The protocol presented here sets out a checklist of issues and information that **practitioners** undertaking primary valuation studies should report to enable easier and more effective value transfer applications in future.

The protocol should be interpreted is an 'ideal checklist' and depending on the scope of the primary valuation it may not be possible to report all of the information detailed. A study that does not cover all of the items could still be a good quality and suitable study and selected for value transfer.

The protocol may also help analysts undertaking value transfer judge the quality and suitability of primary valuation studies in relation to the policy good of interest (in conjunction with **Step 4** of the Value Transfer Guidelines and **Annex 2)**.

II. Basis for the protocol

The protocol is based on the information needs for value transfer following the **Steps 1-8** presented in the Guidelines, as well recommendations from the accompanying *Technical Report* and the extensive validity testing literature for economic valuation studies. The key considerations for undertaking value transfer and assessing the suitability of a primary study are the:

i). Similarity of the policy good and study good;
ii). Similarity of the change in provision of the policy good and study good;
iii). Similarity of the sites where the policy good and study good are found;
iv). Similarity of the policy good and study good affected populations;
v). Similarity of the policy good and study good market constructs; and
vi). Similarity of the number and quality of substitutes for the policy good and study good.

And that the:

vii). Primary valuation study tests and presents robust results.

Where the 'policy good' is the good to be valued via value transfer, and the 'study good' is the good valued by the primary valuation study.

The protocol reported in the next section covers the considerations (i) to (vi). Further detail on how to judge the quality of the study results is provided in **Annexes 2** and **3**.

III.   Protocol for practitioners reporting primary valuation studies

In reporting primary valuation study results, practitioners should:

a.   **Define the overall policy context**

⇒ *What is the policy objective that is leading to the change valued?*
The policy objective determines the purpose and scope of the valuation study. To show the appropriate methodology and scope have been used in the study, the overall context must be described. The policy objective also determines the nature of the change (see below).

⇒ *What are the context specific factors that may influence the results?*
The policy change itself (in addition to the characteristics of the good, the change and the affected population – see below) may give rise to context-specific factors that influence results. For example:

- The attitudes of the sample interviewed in a stated preference study may be significant determinants of their WTP and may not be wholly explained by socio-economic or resource use factors, but by context-specific factors such as the history of use of that resource, previous or other related policies in the area and so on.
- The more important the influence of such factors the more difficult value transfer will likely be due to the difficulty of ensuring sufficient similarity of, or otherwise controlling for, such factors between study and policy sites.

b.   **Define the study good**

⇒ *What is the good?*
The definition of the good should describe the good (this could be a non-market or market good or resource) and, where possible and relevant (e.g. when affected), the individual ecosystem services provided by the resource. The use of ecosystem services approach[1] as a framework to define the study (and policy) good is increasing and new primary valuation studies should use this approach where appropriate.

⇒ *Where is the good?*
Empirical evidence indicates that the location of the good affects its value for various reasons. For example:

- Individuals tend to care more about the goods that are near them or the goods they use more often (distance to the good is typically a proxy for use).

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[1] See Defra (2007) *An Introductory Guide to Valuing Ecosystem Services,* December 2007.

- Related to the above, as the distance between the individual's residence and the good increase, the abundance of possible substitutes for the good also increases, as does the costs of use, in terms of travel time and cost. The definition of the location of the good, therefore, should include what substitutes there are likely to exist for the study good.
- The availability of complements may also influence values and hence should be defined, where relevant.

⇒ *What uses are made of it?*
Direct and indirect uses of the good should be defined (even if not all are valued in a given study). The ecosystem services approach is particularly useful in identifying indirect uses of a good.

⇒ *Is it likely to have non-use values associated with it, if so why?*
There are no 'rules' as to which goods are likely to attract non-use values. A description of the uniqueness or importance of the good can help the value transfer analyst to make this judgement. Importance or uniqueness could be at a local, national or international level. Even if non-use values (or the values held by non-users) are not estimated by the study, a discussion about them should be included.

⇒ *What are the 'baseline' conditions?*
The baseline should be defined as the state of the study good *without* the change valued. Changes in the provision of the good (see below) should be over and above this baseline. Where possible, the baseline should be defined both in terms of environmental and economic conditions of the provision of the study good.

c. **Define the change in the provision of the study good**:

⇒ *What is the nature of the change?*
There are two main dimensions to the nature of the change:

i). The direction of the change - i.e. is it an improvement or a degradation? and
ii). The type of change – i.e. is it the change in the quantity of the good or is it a change in the quality of the good?

Alternatively, the quality and/or quantity of the good may remain the same as in the baseline but access for the affected population may change. Empirical evidence shows that individuals have different values associated with improvements and degradation and quality and quantity and access changes may have different implications for economic welfare.

⇒ *Where (in particular for spatially distributed goods) does the change occur?*
The location of change is important in the same way as the location of the good is as outlined above. The location of change also contributes to the definition of the affected population. For example:

- A river may be used for recreation all along its length. If the change in the water quality affects, say, only the lower stretch, the affected population would be only those who use the lower half, not the entirety of the river (assuming there is no non-use value associated with the river).

⇒ **What is the time frame of the change?**
It is important to describe the profile of change over time and specify at which point in time the changes are valued; this is especially crucial if the change is dynamic over time. For example:

- The change (e.g. pollution of groundwater if not cleaned-up) may not be constant over time. This may mean in the future a larger population may be affected (e.g. as the pollution of groundwater spreads over wider areas).
- The opposite could also be true – for example as the mitigation measures (e.g. tree planting) around a transport scheme mature, the landscape impacts of the scheme may decline.

d. **Define the affected population**:

⇒ *How is the affected population defined?*
This should be an outcome of the definition of the study good and the change in the provision of the study good. The effect could be defined in terms of the change in the quality and/or quantity of the good or the access to it – the latter is specific to users (or possibly altruistic motivations of non-users).

⇒ *Who are the users?*
This should include both direct and indirect users, as relevant to the study good and for the latter can make use of the ecosystem services approach. The users could be for a specific activity or purpose or the general resident population in the affected area.

⇒ *Who are likely to hold non-use values?*
Users as well as non-users are likely to hold non-use values. Most studies (necessarily stated preference studies) differentiate between user and non-user populations rather than use and non-use values. The existence and size of the non-user population can be hypothesized on the basis of the definition of the good and changes in its provision. The study should report what this hypothesis is and whether it has been tested through empirical research and if not, why not. This discussion will help the value transfer analyst to decide whether the estimation of use values alone is an under-estimate if non-use values are not accounted for.

⇒ *Is a distance-decay relationship calculated?*
For spatially distributed goods, the location of the good and its users / non-users is important for the reasons outlined above in (b) and (c) above. The study should report whether a distance – decay relationship was investigated (e.g. by sampling in different distance bands for travel cost and stated preference studies) and if not, why not. For some goods, the frequency of use / viewing / contact with the good may be more appropriate measure. In fact distance is usually a proxy for familiarity or frequency of use. In any case the study should report on this relationship and explain its findings or why the relationship was not explored.

⇒ *What are the basic socio-economic data about the affected population?*
Economic theory and empirical evidence show that socio-economic characteristics of individuals are key factors in determining their preferences for environmental goods. This

applies to all economic valuation methods but is more explicitly explored in revealed and stated preference studies.

The socio-economic characteristics of interest are income, age, gender, education, occupation, type of employment (e.g. full or part-time), other wealth indicators such as car ownership[2], other household characteristics such as the number of people in the household and their age composition, and any other characteristics relevant to the study context. Occupation and job title are combined to give socio-economic grouping (A – E)[3].

e. **Present full details of the analysis and results**

Set out below are the basic questions that need to be addressed by the reporting of a primary valuation study so that value transfer analysts can assesses the suitability of economic valuation evidence provided[4]:

⇒ **What is the full econometric function that best fits the WTP / WTA data incorporating context specific factors?**
Ideally studies should test different models to establish the best fit model and all should be reported. Significance of the overall model and individual factors (explanatory variables) should be presented along with an interpretation of findings.

⇒ **What is the simple WTP / WTA function for value transfer purposes?**
This is a function that includes the factors that are (a) predicted from economic theory and empirical evidence to influence value estimates and (b) are relatively easy to find data for in a value transfer application (and hence easier to judge similarity between the study and policy good context and apply a value function transfer approach). These factors are typically limited to:

- The change in the provision of the good; i.e. the scope of the change
- The costs faced in using/accessing the good (for non-market goods this may primarily by related to proximity to the individual as revealed by a distance-decay relationship)
- The availability of substitutes
- Income (or proxy variables for this)

While these simplified functions are not always reported by primary valuation studies to date, recent research shows that the transfer error using such functions may be lower than a full function with context specific factors. Thus, reporting these simplified functions should be made a part of the best practice guidance.

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[2] Generally income, socio-economic group and education (and/or measures of wealth) should not be used in the same function as there is typically a strong correlation between them.

[3] A- Higher managerial, administrative, professional e.g. chief executive, senior civil servant, surgeon;
B - Intermediate managerial, administrative, professional e.g. bank manager, teacher;
C1- Supervisory, clerical, junior managerial e.g. shop floor supervisor, bank clerk, sales person;
C2 - Skilled manual workers e.g. electrician, carpenter;
D- Semi-skilled and unskilled manual workers e.g. assembly line worker, refuse collector, messenger;
E - Casual labourers, pensioners, unemployed e.g. pensioners without private pensions and anyone living on basic benefits.

[4] How the value transfer analyst should judge the quality of a study and its results are covered in Annex 2 and 3.

⇒ **Is the distance (or frequency) decay relationship tested?**
If a distance (frequency) decay relationship is found in the results, this should be reported and the results explained. If the relationship is not tested, the reason should be reported.

⇒ **Are the key validity measuring parameters of the data analysis and methodology reported?**
This should include: goodness of model fit, statistical significance of parameter estimates, confidence intervals, etc.

⇒ **What are the response rates and protest rates**
If relevant (i.e. for survey based valuation methods) these details should be reported.

In addition, reporting of primary valuation studies should present data (or at least references to data sources), figures, maps, graphs as much as possible as well as numerical results and text.