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Toolbox with Valuation of Forest Ecosystem Services Approaches

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Introduction

The wide range of goods and services that are provided by forests puts a considerable challenge to forest managers and decision makers. Namely, they have to consider different needs and preferences when taking decisions on how to manage forests and which ecosystem services should be provided. When taking these decisions they need reliable and objective support information. This data can be obtained from different methodological approaches, one of them being the economic analysis of different management alternatives. In general the economic analysis monetises the different outputs (services) provided by forests under different management scenarios and compares them with any incurred costs. However, to accomplish this approach, the economic valuation of the provided ecosystem services has to consider *market* (e.g., wood, cork, mushrooms) and *non-market services* (e.g., recreation, air purification, biodiversity enhancement) There is a lot of confusion between the terms non-wood, non-market, function, good, service.

Very often there is confusion when using the terms "*non-wood forest products*", "*non-timber forest products*", and "*non-market forest goods and services*". While the first two terms refer to forest goods only with respect to their physical characteristics (not wooden), the last term refers to the market position of certain goods and services. Thus "non-wood forest products are goods of biological origin other than wood derived from forest, other wooded land and trees outside the forest" (FAO 1999). Consequently, timber, chips, charcoal and fuel wood, as well as small wooden products such as tools, household equipment and carvings are excluded from this category of forest products. In contrast, non-timber forest products also include fuel wood and small wooden products (FAO 1999).

Finally by using the label non-market goods and services it is referring to forest goods and services that cannot be bought or sold in a traditional market and are provided to the community as a whole free of charge, or to individual consumers either free of charge or at a symbolic fee which is well below production costs (OECD 2000).

Namely, a fundamental distinction in economics is between market and non-market goods and services. Goods and services in a free market economy are sold for prices that reflect a balance between the costs of production and what people are willing to pay. Some forest services, such as timber, are traded in markets; thus their value can be directly observed (market prices). Conversely, non-market services cannot be bought or sold in a traditional market and are provided to the community as a whole free of charge, or to individual consumers either free of charge or at a symbolic fee which is well below production costs. Therefore, a non-market good does not have a directly observable monetary value.

While, for the valuation of market services the market prices can be used as an proxy, the non-market services' valuation requires alternative approaches. The following section provides an overview of the different valuation approaches and summarizes some of their main characteristics.

Economic valuation approaches are based on the fundamental principles of welfare economics; whereby the changes in the well-being of individuals are reflected in their willingness to pay or willingness to accept compensation for changes in their level of use of a particular service or bundle of services. These approaches can be divided into Revealed Preference and Stated Preference methods.

i. The revealed preference methods are based on actual observed market behaviour (e.g. purchases of certain goods). The value of forest goods and services in question can be either derived directly (e.g. from market prices) or indirectly from surrogate markets that have direct relationship with the forest good or service of interest (Travel Cost Method, Hedonic pricing method). The advantage of these methods is that they are based on actual market behaviour; however, they can be applied only to use values.

ii. Stated preference methods (e.g. Contingent Valuation Method, Choice Modelling) are based on hypothetical rather than actual behaviour data. The value of a forest good or service is derived from people's responses to questions describing hypothetical markets or situations. The methods in this group can be applied to all types of market forest goods and services and allow to estimate both use and non-use values. Their main disadvantages are that they are based on hypothetical situations (often dealing with goods and services unfamiliar to the wider public and thus difficult to understand) and their application is complex (requiring expert knowledge) and time consuming.

Very often, time and resources are limited and new primary environmental valuation studies cannot be performed before making important decisions. When searching for the most cost-efficient techniques, decision makers try to transfer economic estimates from previous studies that have similar changes in environmental quality and thus, providing a value for the environmental changes in question. This procedure is often termed as benefit transfer. Benefit transfer has been the subject of considerable controversy, as it is often used inappropriately. The consensus seems to be that benefit transfer can provide valid and reliable estimates under certain conditions. These conditions include the requirement that the commodity or the service being valued must be very similar to the ones on which the estimates were made. The estimates – i.e. the site, the populations affected – must have very similar characteristics. Of course, the original estimates being transferred must themselves be reliable in order for any attempt at transfer to be meaningful.

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Conclusions

The estimated value of a certain non-market forest good or service reflects the benefits perceived by the society. This value can be applied among other for raising public awareness about the contribution of the good to the social welfare; to justify the investment into certain type of forest management; to support land use decisions; to compare costs and benefits from alternative projects or programmes, etc.

However, the estimated value cannot be directly used to determine the amount of compensation that should be paid to the provider of a non-market forest good or service. The amount of compensation is subject to negotiation between the provider and the beneficiaries. In general it should be based on the forgone income or additional costs that the provider has to bear due to the provision of the non-market good/service. In this respect, there is a considerable lack of information about the costs of the provision of non-market forest goods and services, which in the past were estimated only upon income lost due to, for example, decreased timber harvest.

- Many different concrete valuation systems are used for the expression of importance of non-production forest services for the society in different countries by their socio-economic, historical, natural conditions, and input data availability.
- In valuation of forests services of a non-market nature there is an enormous share of subjective factors.
- Methods and their results are based on purpose of valuation, socio-economic conditions and input data availability.
- Valuation represents not only a professional issue but also a political issue of enforcement of respective political interests.
- Nevertheless, valuation approaches and results should consider rational relationships between economic, ecological and social aspects of forest services.