

The EU FP7 project NEWFOREX focused on the issue forest ecosystem services and the improved provision of these. It is well-known to most people that forest provides many other goods and services to people than those traded in the market place. Where timber and fuel wood are prominent among the marketed goods, there are numerous and often major groups of goods and services that are not marketed. These include mushrooms, berries and other goods collected for free, recreational services at large, carbon sequestration, the protection of biodiversity and many other things. These goods and services remain externalities of forest production.

Methods for assessing these values have been under development for the last three decades, yet remain in incomplete use with considerable room for improvement. In particular the understanding of *who benefits* from the provision of forest ecosystem services has not been studied in any detail in spite of the obvious policy relevance. Furthermore, as forest owners are not rewarded for the value of these externalities they may make decisions providing less non-marketed ecosystem services than optimal; this represents what economists call a market failure. Because of the market failure, it is likely that we as a society can increase welfare, if we develop ways to enhance their provision. If Society asks forest owners to change their forest management practices to provide more ecosystem services, they will incur costs in different forms, and methods to assess these become important. Furthermore, it stress the need to consider how society can design its policies for enhanced ecosystem service provision and begs the question of who should carry the costs of an enhanced provision.

The three main objectives of NEWFOREX reflected these issues and were specifically:

1. To provide methods for valuing forest externalities, which handle the jointly produced externalities in an integrated way, where specific attention will be given to the question: Who benefits? This is important as it is among the beneficiaries that likely 'buyers' are to be found.
2. To develop a methodology for assessing the cost of provision for externalities. We experiment with methods in order to take into account trans-boundary effects of forest management, and transactions and opportunity costs.
3. To assess several market-based methods for enhancing the provision of forest externalities, including e.g. payment schemes provision, certification or (re-)definition of property rights, and point towards new potentials for improved policy instruments.

Numerous results have been obtained regarding the insights into 1) drivers of demand for forest ecosystem services across the case studies, 2) the conditions under which they may be supplied, 3) how benefits and values are distributed among the population in the case study regions, 4) awareness and knowledge about provision costs, 5) forest owners perception of cost of provision and market based instruments, 5) the diversity of policy instruments in use for enhancing the provision of forest ecosystem services, and 6) institutional aspects affecting the performance of selected economic instruments across the case studies.

To reach these results NEWFOREX researchers worked extensively with stakeholders and undertook analytical, applied research using a set of empirical surveys among potential beneficiaries (citizens, buyers) and providers (forest owners) of forest ecosystem services. These took place in several EU case studies and a developing country case study in Brazil. The researcher focused in particular, but not exclusively, on key externalities: Carbon sequestration, biodiversity protection, watershed services and recreation services. The surveys were designed as far as possible to allow for comparative analyses and detailed results supporting the achievement of the objectives and relevant policies in the case areas. Addressing the demand and supply side simultaneously is a unique and innovative stroke of the NEWFOREX project.

NEWFOREX has produced ample evidence for European citizens' willingness to pay for enhanced provision of several forest ecosystem services over a wide range including biodiversity protection, carbon sequestration, recreational aspects, groundwater recharge and many more. Furthermore, NEWFOREX has provided examples of how a better modelling of the heterogeneity of preferences across citizens for specific forest ecosystem services can shed important light on the distributional and essentially democratic impacts and aspects of environmental values. For example both in the Finnish and Danish cases, results showed considerable variation in preferences for enhancing specific recreational options. In the Danish case, the researchers applied a novel discrete mixture preference model to obtain deep information on the distribution. They found that while additional access rights overall had a positive value, this result was created by a large minority deriving moderate to fairly high values from the option whereas a small majority in fact found increased access of low to moderate negative value – expressing concerns for recreational quality and biodiversity protection. Clearly such information is of policy relevance (See FIGURE 1).

NEWFOREX has undertaken a very comprehensive survey of forest land owners covering part of six European countries and a region in Brazil. The survey results in combination with empirical models of forest production and forest economics have allowed NEWFOREX to test and evaluate a number of methods for assessing the cost of provision of forest ecosystem services. A central result is that current practices for assessing such costs in policy practice differ substantially across countries; reflecting difference in forest owner populations and forest management practices. Further results include the successful application of stated preference methods in Brazil, Finland and Denmark to reveal forest land owners willingness to enter into conditional contracts targeting various ecosystem services. Results revealed substantial variation in forest owner opportunity costs for given contract types, e.g. among Brazilian smallholders in the Amazon (FIGURE 2). The different methods also allow an assessment of various contracting aspects and the role of transactions costs, additionality issues and many other things.

Clearly, these variations in preferences can be used to inform policy design and in particular increase the targeting of policies to those groups and areas where win-win options are more likely.

NEWFOREX have investigated ongoing policy instruments for forest ecosystem service provision and have evaluated potentially new such instruments with the help of forest owners as well as the general public. One of the most important political aspects of any policy designed to enhance the provision of ecosystem services is the aspect of distribution of costs and benefits across those who demand and benefit from and those that supply the ecosystem service. In NEWFOREX we asked the public (and in some cases also the forest owners) about their view on this distribution for different ecosystem services. The results for recreational services are shown in FIGURE 3. The results spell out an important aspect often overlooked when debating policies like payment for ecosystem services: The issue of a legitimate design. We have many demands for such policies. We want them to be cost effective – coordinating efforts across people that can deliver the best value for money. They must ensure additionality – we don't want to pay for things, we would have anyway. We want to encourage compliance and rule out undue rent opportunities. However, to gain public support, we *also* need the policies to be legitimate and acceptable in terms of, e.g. equity or ethical concerns, or with respect to the distribution of costs, benefits and rights. The results of NEWFOREX show that the answer to who should carry the cost depends quite a bit on the context. Only when – as in the national park area in Finland – there are obvious ways to have users pay, do a significant part of the public place their trust in this. There is generally highest support for society (that is all of us) to carry the costs jointly and compensate the forest owners for costs.

The results of NEWFOREX have been and still are being disseminated in numerous presentations for professionals, forest owners, policy makers and in written form in policy and scientific papers. Furthermore, two book volumes of policy oriented short chapters on specific aspects of forest ecosystem services are being printed in the fall of 2014.