

Study on the Economic value of groundwater and biodiversity in European forests

for the European Commission, Directorate General Environment

by

**The IUCN Regional Office for Europe (IUCN ROE) – Chantal van Ham
IUCN Environmental Law Centre (IUCN ELC) – Thomas Greiber
Confederation for European Forest Owners (CEPF) – Gerben Janse & Marta Gaworska**

January 2009



Executive summary

National and international attention for the vulnerability of water systems is increasing, as in more and more regions across the globe, drought conditions have been exacerbated if not created by increased population density and land development, which, in turn, may have been made even worse by global warming, resulting in record-setting droughts.

From a European perspective, over the past thirty years, droughts have dramatically increased in number and intensity in the EU. Recent trends show a significant extension of water scarcity across Europe. In a context where changes in climate are foreseen, this trend is expected to continue and even worsen and the EU states that a number of challenges have to be addressed: full implementation of the Water Framework Directive (WFD), ineffective water pricing policies in EU member states, water saving strategies and initiatives, integration of water-related concerns into water-related sectoral policies, as well as collecting information and creating knowledge.

Ecosystems provide a wealth of services that are fundamental for proper environmental functioning and economic and social development. While the demand for these services, including provision of clean freshwater is continually increasing, the capacity of ecosystems to provide such services is hampered by their ever-growing degradation.

The availability and quality of water in many regions of the world are more and more threatened by overuse, misuse and pollution and it is increasingly recognised that this is strongly influenced by forests. Forests can protect drinking water supplies. Managed forests usually have lower input of nutrients, pesticides and other chemicals than more intensive land uses such as agriculture. Forests can also protect soils and reduce erosion rates.

Most ecosystem services are not traded on markets and do not have a price, but this does not mean they have no economic value. In recent years, innovative financing mechanisms, and especially payments for ecosystem services (PES) have been recognised as crucial for addressing some of the failures in environmental management.

This report aims to give an insight in the economic value of groundwater and biodiversity in European forests. It will explore the current state of the art of PES in EU member states in relation to forests and groundwater, by looking at the following objectives:

- To analyse the different ownership structures of groundwater sources and the financial benefits for the use of this natural resource that currently exist in forest areas in Europe;
- To develop a case for integrating the economic value of groundwater and the ecosystem services provided by European forests into EU policy instruments;
- To develop knowledge on the opportunities for nature conservation and more specifically sustainable forest management in relation to the economic value of groundwater resources.

Economic development that destroys biodiversity and impairs services can create costs to humanity in the long run that can greatly exceed the short-term economic benefits of the development. These costs are generally hidden from traditional economic accounting, but are nonetheless real and are usually borne by society at large. Tragically, a short-term focus in land-use decisions often sets in motion potentially great costs to be borne by future generations. This suggests a need for policies that achieve a balance between sustaining ecosystem services and pursuing the worthy short-term goals of economic development.

The prices charged to consumers for water consumption are typically not reliable measures of the value of the water to consumers, as they are often set administratively, with no regard for supply and demand. This can be misleading, as the ecosystem services essential for providing drinking water can often not be protected on the basis of the price paid for it. Payments for ecosystem services is a new financing mechanism that rewards stakeholders who conserve natural resources by providing payments for valuable goods and services resulting from their conservation activities.

The PES approach is attractive for a number of reasons, as it:

- generates new financing, which would not otherwise be available for conservation;

- is likely to be sustainable, as it depends on the mutual self-interest of service users and providers and not on the whims of government or donor funding; and
- is likely to be efficient, as it conserves services of which the benefits exceed the cost of providing them, and does not conserve services when the opposite is true.

Three types of PES exist: self-organized private agreements that are negotiated business-to-business or business-to-community; public payment schemes through which public agencies purchase services; and trading schemes, in which industries can trade credits below an established cap.

In this report, the state of development of forest-groundwater related PES schemes in the EU has been explored. It is demonstrated that PES structures exist in EU member states which fund afforestation and sustainable forest management practices and thus support, maintain or even develop the protective functions of forests with regards to groundwater. The case studies in Denmark, Germany, Spain and Austria, show that PES schemes can comprise diverse structures which have to be distinguished. They can range from voluntary compensation to non-voluntary compensation schemes for forest maintenance, afforestation, reforestation and sometimes agro-environmental activities.

The report shows that forest-groundwater PES schemes are not yet in place in most countries of the EU. However, the case studies prove that PES can be a valuable instrument for increasing the interest of land and forest owners in developing these forest functions, because if designed and implemented well, PES offer great potential for protecting ecosystems. The future development of such mechanisms in other countries can benefit from the experiences of the existing examples.

The report further indicates that the WFD as well as the legislation of several EU member states have the potential to promote the development of future forest-groundwater PES in more EU member states. While the forest and groundwater related legal frameworks differ considerably from member state to member state, it is possible to find a clear answer to each of the following questions:

Who has a right to and therefore can be paid for the ecosystem services which are provided?

- The owners of forests which provide groundwater related ecosystem services can become sellers in forest-groundwater PES schemes. Forests in EU member states are either owned by private or public entities.

Who has to pay for the benefits received from the provided ecosystem services?

- In all EU member states, usually all groundwater users (private households, industries, and the agricultural sector) are obliged to pay for the utilization of groundwater resources. Such payments are sometimes dedicated to environmental purposes.

Who facilitates the development and implementation of PES agreements between the different parties involved (providers and beneficiaries)?

- The entity which collects the payments made for the provision of groundwater resources has the potential to become an intermediary who facilitates the development and implementation of PES schemes by linking the charges paid by the water users to providers of groundwater related forest ecosystem services.

The frameworks of some member states show a need for consolidation which would make the actual implementation of especially groundwater related legislation much easier. Such efforts are ongoing in a number of countries, but not yet all.

In this context, the WFD can be a trigger for member states to include PES schemes for the conservation of groundwater related forest ecosystem services in their groundwater policies and legislation. The obligation to develop river management plans supports an integrated water resources management approach and provides an opportunity to build the case for forest-groundwater PES. Also, the required economic analysis and the concept of full cost recovery could influence the decision-making in favour of the establishment of forest-groundwater PES.

However, in order to tap the full potential of the WFD for the development of such PES schemes, it has to be clarified that:

- Forest ecosystem services should be used for the achievement of environmental objectives and therefore need to be considered by the economic analysis and in river basin management decisions, and
- Forest ecosystem services are “water services” as defined in Article 2 (38) WFD and therefore part of the principle of full cost recovery.

Currently, the protective functions of forests are seldom leading to any income generation for forest owners. In addition to countries’ groundwater compensation structures, a variety of EU funds and financial instruments address environmental and social dimensions of sustainable forest management and environment in general. Those funds might provide additional financial resources to develop and implement forest-groundwater PES schemes. In this report, a number of key aspects have been highlighted to define the scope of PES schemes related to forests and groundwater in Europe:

- In the forest as well as groundwater related legislation of EU member states, different legal instruments can be identified which directly oblige forest owners to take protection measures for groundwater resources. Apart from the possibility of designating groundwater protection areas which prohibit certain forest uses, other groundwater related obligations of forest owners exist. Since groundwater bodies are generally considered important resources for drinking water supply, the public interest in their protection often prevails over the vested property rights. As a consequence, regardless of public or private forest ownership, as well as the country’s legal approach to groundwater ownership (public ownership, public-private ownership, and *res nullius*), forest management has to take possible impacts on groundwater resources into account.
- The groundwater compensation structures in EU member states show clear possibilities for introducing payments for environmental services. Eco-taxes are already used in a number of countries to collect funds for environmental protection measures. Green fees can also be charged to groundwater users.
- Restoration and maintenance of forest ecosystems is not only a high priority for the strengthening of Natura 2000 and biodiversity protection, but also for the protection of drinking water resources. In Natura 2000 sites, the economic function of forests, usually the highest priority in forest management, will have to be adapted according to the requirements of the ecological function and the conservation of biodiversity, which calls for changes in current forest management practices.
- Small scale PES projects can qualify as LIFE+ projects which help to develop PES experiences that benefit policy-making afterwards.
- The pricing of water needs to internalize the additional management costs of forests, which are incurred to cater for the needs of water protection. The segment of the water price, which covers these additional management costs has to be paid to the resource manager or owner. In addition, it is important that water suppliers have the right to pass on environmental costs in the water price to their customers.
- Prevention of pollution is more cost effective than reducing it once groundwater has already reached high levels of pollution. Costs of cleaning polluted water are clearly higher than establishing management practices for forests and water areas that prevent the deterioration of water quality. Therefore, having a system to pay for pollution, as suggested by the Water Framework Directive, according to its “Polluter Pays Principle”, should be replaced by a system that provides incentives for the prevention of pollution. In general, incentives are a better tool than payments for obtaining commitment of water users and providers.
- Considering water protection forests as “natural infrastructure” is vitally important to maintain the production of, inter alia, the ecosystem service of providing drinking water in required quantity and quality. Restoration and maintenance of the natural ecosystems can contribute to reducing the costs of providing clean drinking water, now and in the future.

- To protect watershed areas and to enhance the water quality to achieve a good ecological status, a strong link can be made between the Water Framework Directive and LIFE+, as the LIFE+ offers funding opportunities to invest in improvement of environmental protection.

Various EU policy and instruments have to be combined to create complementary and cross-cutting methods for establishing payment for ecosystem services in relation to groundwater and forests.

There are two complementary types of PES schemes, which are: 1) investments, such as the transformation of forests and reforestation and 2) those that are related to maintenance and management of the existing ecosystems.

Under the current EU regulations, integration of environmental priorities in their spending programmes is not an obligation for individual member states. Therefore it is highly important that efforts are made to raise awareness with all parties involved, for the opportunities of PES schemes at a member state level. Rather than creating legal rights and obligations for compensation of forest owners for delivering the service of clean water, one should be offering voluntary schemes of incentives. EU Member States should be encouraged to follow this advice, taking into account that there are major differences among member states with regards to groundwater ownership, internalization of management costs of water protection forests into water pricing and the sharing of income generated by water use.

To conclude the analysis of opportunities for the development of PES based on existing EU policy and funding instruments leads to three options:

1. Use existing policies and regulations to introduce PES schemes.
2. Introduce changes to existing policies and regulations, to be adopted by Council, in order to better reflect the opportunities for PES with cross-linking the different policy areas. This also includes reviews of existing regulations, such as the CAP Health check.
3. Design a comprehensive scheme or new Directive for PES.