

Ecosystem Goods and Services from Planted Forests

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What ecosystem services do plantations deliver?

At present forest plantations cover less than 5% of the global forest area, but they provide approximately 40% of the forest products. In many parts of the world the area of plantations is increasing very fast, and so is their importance to provide and maintain ecosystem services. Among these services, the maintenance and conservation of biodiversity, the storage and sequestration of carbon, and the regulation of water flow may be considered as most important. However, there is still a large discrepancy between the market value of most ecosystem goods and services (EGS) and their potential value.

What can plantations do for biodiversity?

Plantations can provide habitats. They are important for connecting and buffering native ecosystems and can reduce the pressure on native systems. However, there are studies that show that the response of certain taxonomic groups to the structures and management of plantations varies considerably. Therefore, intensive long-term multi-taxa monitoring programs will be needed to improve predictions about the effects of plantations on biodiversity.

What is the role of plantations in the carbon cycle?

In plantations, C sequestration is known to be quite high, whereas C storage is usually low. Most of the C sequestration takes place above ground. For the evaluation of the role of plantations it is therefore crucial to know what happens with the products of the plantations. It is also important to develop plantation models that can be integrated into decision support systems at landscape level to estimate the costs and benefits of C sequestration.

What are the effects on hydrological cycles?

In most situations, plantations will decrease runoff. This is not the case, however, with plantations established on degraded sites where the increase in infiltration rates is in excess of the increase in evapotranspiration. And yet, plantations can deliver substantial benefits where there is too much water in the landscape, or with regard to improving water quality. However, there is a gap between the public perception of the benefits from plantations for hydrological cycles, and the scientific evidence observed. This gap must be bridged by more research and by better communicating scientific findings to policy makers.

Can the rural population benefit from plantations?

With the decrease of natural forest areas, the role of plantations becomes ever more important for the livelihoods of rural people. However, in the tropics, for example, it is often the case that livelihood strategies of rural people are not considered in the development and management of plantations. Therefore, it is not surprising that rural people may not benefit from plantations. Still, many case studies show that plantations can be very valuable where



Eucalypt plantation, by courtesy of Juergen Bauhus

they complement other land uses, and where they replace services from native forests which have become inaccessible.

Towards a better provision of EGS from plantations

The provision of EGS from plantations may be enhanced through sound planning and management at the stand and landscape level. While silvicultural principals to manipulate the provision of EGS at different spatial scales are known in principle, they require local specifications for different plantation settings. Tools to analyze trade-offs between the provision of different EGS are required for optimizing silvicultural management. Based on the typology of different ecosystem services, there are different approaches which can be used to assign EGS to different landscape units, to rank these and to analyze their spatial provision. With regard to the policy setting of plantations, both regulatory and market mechanisms are needed for the successful establishment of payment schemes for EGS.

More at

<http://www.waldbau.uni-freiburg.de/bilbao.html>

Scientific forum on "Ecosystem Goods and Services (EGS) from Planted Forests" held as a part of the IUFRO-sponsored Int'l Congress on "Planted Forests and Sustainable Development" in Bilbao, Spain, from 3 to 7 October 2006.

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Terminology