



Science for Environment Policy

Environmental Impact Assessments of developments should incorporate impacts on ecosystem services

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Ecosystems services — the benefits that nature provides to people — are inadequately accounted for in Environmental Impact Assessments, a new study suggests. The researchers used a case study in France to illustrate the substantial economic losses that are incurred as a result of infrastructure development that goes ahead without sufficient consideration of the impacts on ecosystem services.

Habitat degradation and ecosystem destruction continue worldwide, largely as a result of human developments. Along with the loss of biodiversity this leads to a reduction in ecosystem services, which include a vast array of different services, from pollination to recreation.

Despite these important benefits, however, they are rarely assessed as part of the decision-making process for new developments. In particular, very few ecosystem services are included in Environmental Impact Assessments. This means that unless the area under consideration for new developments contains a specially protected habitat or species, long-term environmental concerns are considered secondary to short-term economic gain.

For this study, researchers drew up a framework to assess the impacts of building a large linear section of infrastructure (such as a road, rail or waterway) on the ecosystem services in the area. They then tested their approach by assessing different options for a high-speed rail project in western France.

The framework consisted of four steps: (1) identification of the potential ecosystem services that would be affected in the landscape; (2) identification of ecosystem service loss as a result of direct or indirect impacts; (3) economic valuation of the loss of the services; (4) following steps 1-3 for different options (e.g. different routes of a railway line) in order to compare them.

The researchers stress that it is very important to consider both direct and indirect impacts, because indirect effects can have significant impacts. For example, a railway line or road may prevent wildlife moving from one section of habitat to another resulting in a reduced population of that species and affecting ecosystem services such as recreation in the form of tourism or hunting. They also caution of the need to consider ecosystem thresholds, in other words after a certain 'tipping point' an ecosystem service may cease to function entirely.

For their case study of a rail development, the researchers calculated the potential loss, and the estimated [economic](#) values of those losses for 11 ecosystem services, including air purification, flood protection, pollination and natural control of plant pests. None of these, except flood protection, are currently included in Environmental Impact Assessments.

The results show that the loss of ecosystem services as a result of infrastructure development causes substantial economic losses. For example, in this case study the economic values of the ecosystem services that would be lost were worth approximately €228 000 every year even for the best possible option. Furthermore, it is not just the direct effects that need to be accounted for, as indirect effects also had substantial impacts.

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A further important result for decision makers to bear in mind was that the longest route for the linear infrastructure development was in fact found to be the one with the smallest effects on ecosystem services. The shortest route is therefore not always the one with the least environmental impact, the authors stress.

In conclusion, while the researchers acknowledge that there are many uncertainties associated with economic valuation of ecosystem services, they highlight the fact that the many various impacts of infrastructure development on ecosystem services are currently inadequately accounted for and should be explicitly addressed in Environmental Impact Assessments.



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1. For more information about ongoing work on Mapping and Assessment of Ecosystems and their Services in the EU see: http://ec.europa.eu/environment/nature/knowledge/ecosystem_assessment/index_en.htm