Land use and biodiversity modeling

Tools to determine the impact of socio-economic developments on the environment

Policy makers are increasingly aware of the risks of uncontrolled biodiversity loss, and need to be well informed about the expected level of loss and trends in biodiversity change. In addition, policymakers need insight into the main driving forces of biodiversity loss, especially land use change, in order to identify underlying processes causing these losses.

Land use and biodiversity modeling can help to analyze the impact of socio-economic developments on the environment. Modeling can help address key sustainability issues, such as:

- What is changing (indicators, ecosystem services, monitoring)?
- How is it changing (trends, modeling)?
- What can we do about it (assessment of main drivers and underlying policies)?
- What is the impact of policies (scenarios and assessments of policy options)?

Aidenvironment uses the GLOBIO3 model, developed at the Netherlands Environmental Assessment Agency (PBL), to assess whether policies meet environmental objectives for biodiversity. The model has been developed to assess human induced changes on terrestrial biodiversity; it can assess past, present and future biodiversity at different scales. The model uses a composite indicator that describes the ‘naturalness’ of an area compared to its undisturbed situation, the so-called Mean Species Abundance (MSA) indicator. The indicator combines ecosystem extent with ecosystem quality. It does not have to be measured in the field, which in general would be time consuming and costly. Instead, it can be calculated by using existing information on driving forces. GLOBIO3 is built on simple cause-effect relations between pressures and biodiversity impacts. Pressures include: land use change, infrastructure development, fragmentation, climate change and atmospheric nitrogen deposition. GLOBIO3 has been used successfully in several integrated assessments on global, regional, national and sub-national level.

The GLOBIO3 model is integrated with the CLUE land use model for the assessment of future biodiversity loss due to land use changes. The integration of GLOBIO3 and CLUE permits assessment of the impact of different scenarios or policy alternatives on both, land use change and biodiversity. If results are not in line with biodiversity policy targets, policies can be adjusted.
economic developments on land use and biodiversity change;
• training in land use and biodiversity modeling as part of Integrated Assessments;
• working sessions in modeling and land use scenario building;
• advice on policy alternatives.

With help of the models decision and policy-makers will be able to:
• analyze the impact of existing and future policies on land use change and biodiversity;
• link socio-economic developments and environmental protection with current policies, e.g. climate adaptation measures;
• get a spatial distribution of past, current and future land use and biodiversity;
• generate expected land use and biodiversity trends under various future scenarios.

Our experts at Aidenvironment have carried out several national modeling training schemes in the Netherlands, Thailand, Vietnam, Honduras and Zambia. More than 30 participants from over 20 countries have been trained.

Currently, Aidenvironment is implementing the GLOBIO3 and CLUE models to support the Strategic Environmental Assessment process for the Quang Nam Land Use Plan in Vietnam and Sustainable Development Blueprint in the Papua province of Indonesia.

The GLOBIO–CLUE decision support tool helps policy-makers integrate biodiversity objectives into policy-making’

Interested?
Contact Wilbert van Rooij to find out what we can do for you.

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