Participatory assessment of ecosystem services and their resilience in the design of sustainable landscapes.

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Abstract

Assessing ecosystem services (ES) is the most common method to measure and compare ecosystem wellbeing in landscape planning for ecosystem restoration and biodiversity conservation. Recent research has highlighted the role of landscape configuration and connectivity on ES, demonstrating that increasing landscape and notably forest connectance can improve ecosystem sustainability. There also is increasing interest in reconnecting forests and rivers in projects integrating blue and green belts. Stakeholders increasingly question scientists about the availability of tools to support reflections and decision making in landscape planning. The limitations of existing tools, however, suggest the need to develop new methods for assessing the effects of landscape configuration on the provision of ES and biodiversity conservation.

Our project aims to provide local stakeholders in a suburbanizing agricultural area near Montréal (Québec, Canada) methods and tools to assist them in defining future policies for landscape management. In parallel to the development of knowledge regarding ES provision (including an historical overview of their variations, trade-offs and synergies, and an analysis of the factors driving the provision of the most relevant ES for the region using in field measurement and spatial analysis), 21 local stakeholders were consulted through a focus group to learn their wishes and fears for the future of ecosystems of the region and to the development of tools that could support regional land planning efforts. A second meeting with 15 of these stakeholders discussed the development of a model that quantifies ES for scenarios based on alternative policy and land use decisions, including a review of potential themes organizing future scenarios to be assessed. The modeling approach was presented and discussed in individual interviews to get feedback on the basic structure of the model and its potential future use. Based on this feedback the model was refined and will be the basis for collective sessions involving simulations and assessment of alternative planning scenarios.

∗Speaker
The results presented in the communication will be structured around (i) stakeholder feedback on the project objectives and their expectations, (ii) their assessment of the model as a practical decision-support tool and their recommendations for its implementation, (iii) identifying novel insights gained through presentation and comparison of ES provided by past and present landscape configurations, and finally (iv) scenario assessments of ES and stakeholder preferences for alternative scenarios. We will discuss how, by engaging the stakeholders from the beginning of the project, the objectives and means of our research were adapted to their expectations. We will show how social learning was achieved through regular interactions between scientists and local stakeholders using different boundary objects. We will conclude with a critical analysis of the methods used to achieve research with an efficacious impact on meeting stakeholder needs and expectations.

**Keywords:** Biodiversity, Collective action, Community engagement, Decision making, Ecosystem Services, Land management, Learning, Modeling, Participation, Planning, Resilience assessment, Scenario analysis, Simulation, Stakeholder engagement