



Bioeconomy and sustainability: Future storylines for assessing water quality impacts of intensified agriculture and forestry in the Nordic countries

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The EU Bioeconomy strategy calls for sustainable development of a bio-resource based economy, including replacement of fossil fuels with biofuels while also intensifying crop production to feed a growing world population. In the bioeconomy discourse, sustainability is often considered to be an outcome of the development of a bio-resource based economy that is not reliant on fossil fuels. The commitments to sustainability in this sense are mainly related to mitigation of climate change. Other aspects, such as pollution of water resources, soil degradation and loss of biodiversity, are often neglected. As history has shown, intensification of agriculture and forestry has had tremendous impacts on the environment, particularly on the delivery of water-related ecosystem services. It is therefore highly relevant to problematize the sustainability claims of the bioeconomy by assessing the environmental impacts of the desired intensification of biomass production. This assessment is a central focus of Biowater, a newly established Nordic Centre of Excellence. The overall objective of Biowater is to quantify the integrated and interacting future effects of land-use change, climate change and changes in green technology on water quality and delivery of major ecosystem services, including good ecological status of freshwaters. In order to predict potential water quality impacts of development of the bioeconomy – future storylines that accommodate key elements of changes in land-use and land management are currently being developed. These storylines separate societal commitments to the bioeconomy from societal commitments to sustainability. Commitments to environmental sustainability which support land-use and land management strategies to mitigate agricultural and forestry impacts on water quality are central to the storylines being developed. In addition, changes in governance and technology that may influence the development of the bioeconomy are also in focus. The finalized set of storylines will provide the basis for subsequent quantification and scenario modelling. This presentation will focus on how these storylines were developed, including the use of expert consultation and joint stakeholder workshops; what they encompass; and how they relate to the IPCC Shared Socioeconomic Pathways (SSPs) as well as the EU Water Framework Directive, Common Agricultural Policy and Forest Strategy.