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## Transforming the Economy Sustaining Food, Water, Energy and Justice

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Integrated Sustainability Assessment of Agro-ecological Systems: The Case Study of the “Alta Murgia” National Park in Italy

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**Biography:** Steven Van Passel is associate professor of environmental economics at the Departement of Engineering Management of the University of Antwerp (80%) and at Centre for Environmental Sciences of Hasselt University (20%). As an ecological and environmental economist, he is interested in conceptual and methodological aspects of assessing sustainability, clean technologies and climate change. He has different peer-reviewed journal publications (50 SSI). The Centre for Environmental Sciences of Hasselt University is a multidisciplinary research centre.

**Abstract:** Several indicators and methods are already applied for sustainability assessment in agriculture. The links between sustainability indicators, agricultural management and policies are not well explained. The aim of this study is to combine biophysical and monetary sustainability assessment tools to support agriculture policy decision making.

Four methodological steps are considered: i) the environmental impacts of farms are assessed using terrestrial acidification, freshwater eutrophication, soil and freshwater eco-toxicity as well as natural land transformation; ii) the most relevant indicators of agriculture damages on ecosystems are aggregated into an index; iii) the farms index scores are integrated with farm assets, land and labor, into the Sustainable Value approach (SVA), as indicator of natural resources used by farms; and iv) the return to cost ratio and different resource productivities are assessed.

As a case study, the methodology was applied to arable farms with and without animal husbandry of the "Alta Murgia" National Park. The crops farms, in our sample, have a higher sustainable value using their economic and environmental resources. Mixed farms need to improve their resources use efficiency. Although crop farms have lower land-use efficiency compared to mixed farms, our results suggest supporting, by means of policy options, the specialized crops farms that, on average, perform better in terms of biodiversity preservation. Finally, we find that Life Cycle Assessment (LCA) to soundly measure the environmental impacts clearly enriches the SVA.

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