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Scenario Development for Bioenergy Landscapes Based on the Landscape Services Approach

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The ecosystems of landscapes deliver a multitude of services for mankind. These landscape services save the basics of our live or enhance live quality. Nowadays, landscapes are changing increasingly faster, not at least because of the growing use of renewable energy. What do these changes mean to several landscape services? How can we intervene accordingly?

Landscape scenarios could give answers to these questions. We present a trans-disciplinary method for the draft, analysis and assessment of future landscapes. The framework consists of seven phases, which integrate scenario development and landscape services evaluation. Using this framework, we include local actors both into scenario outline and assessment. Based on future scenarios, management strategies and compensation measures can be discussed and evaluated regarding their functional efficiency.

The framework is exemplified using the most eastern county in Germany called “Landkreis Görlitz”. This region is characterized by a wide landscape gradient from mountains to lowlands, by decreasing population and a specific cultural tradition. It is also a traditional energy region (with open-cast mining areas, wind farms and an increasing amount of renewable raw materials), having few industry and less productive soils. We assume that the region become more importance as an energy region on the basis of renewable raw materials. Particularly, we regard the role of energy crops in economy and their impact on future landscape structure, as well as their contribution to several landscape services.

The poster shows the description of a renewable energy scenario and several maps show the impact on land use and landscape structures. Evaluations of landscape services are given by a landscape barometer showing the main results in a concise and well comprehensible way.

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Structural Indicators for the Assessment of Biodiversity within the Ecosystem Services Framework

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The Ecosystem Services Framework is an established approach for a balanced evaluation of
ecological, economic and social landscape resources. It allows the identification of functional
synergies (win–win situations) as well as trade-offs among various benefits resulting from
ecosystem processes. Besides the direct contributions of biodiversity, also spatial aspects of
landscape heterogeneity and configuration play a major role for the maintaining of human
wellbeing. Also cultural artefacts contribute the landscape functionality. Therefore, the more
suitable term landscape service is increasingly used. We pursue particularly spatial aspects of
that framework and ask for optimizing the trade-offs among landscape services.

The contribution of spatial heterogeneity and landscape structure measures are distinguished
as indicators for landscape services. Landscape heterogeneity is a key measure for
biodiversity and contributes to several valuable functions. Likewise, habitat connectivity and
other measures of landscape structure are essential criteria for the behavior of
meta-populations and for the recreational value. The assessment of habitat and nature
protection networks is demonstrated as an example.

Landscape consists also of artefacts, human activity and even social thinking. Using the
Landscape Services Approach in a broader sense, we can better address also the so-called
social/cultural services because they strongly depend on memorials, structural characteristics,
historical conditions end even on mental specifics which can hardly be subsumed to
ecosystems. Place-based assessments make it possible to include landscape measures for these
issues too and are an appropriate solution for the unification of several spatial categories.

### Urban Municipal Solid Waste Recovery through Regional Collaborative
Research between Malaysia and Japan as Alternative to Landfill
Dependency

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Resource excessive consumption driven by urbanization has put pressure on waste generation
and resulted in environmental impact. This study was intended to determine adequate policy
response in recovering municipal solid waste in urban area to reduce landfill dependency.

Ecological condition was evaluated by cause-effect analysis method conducted in Kuala
Lumpur. Assessment on resource availability was analyzed by means of remote sensing and
GIS data based on environmental parameters, whereas abundant resource was estimated from
composition of collected waste. To enhance implementation, trend, issue and need analysis
was performed and collaborative research was proposed. Applying Japan’s experience-based
approach, assessment on potential of material and energy recovery was performed.
Participation behavior towards material separation practice was evaluated by considering
social parameters, while usage for energy feedstock was conducted by assessing the
applicability of technologies for waste to energy. As long term initiatives, projection of
capacity building aspects was estimated by reviewing technical transferability factors.