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Modelling biomass energy availability: How to integrate stakeholders' decisions ?

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2014 GLOBAL LAND PROJECT OPEN SCIENCE MEETING

Land transformations: between global challenges and local realities

March 19th – 21st, 2014
Berlin, Germany

ABSTRACT TEMPLATE

Abstracts are welcomed in **three different formats**. See on the conference webpage the updated list of accepted conference sessions and categories: <http://www.glp-osm2014.org/>

Oral Presentation:

- 12 minutes + 3 minutes for Q&A
- Under conference session category *Research Presentation Session*

Flash Talk Presentation:

- 5 minutes based on 3 slides
- Under session categories *Round-table Discussion Session* and *Open Session*

Poster:

- Poster exhibition
- Under conference session category *Research Presentation Session*

For subscriptions under conference session categories *World Cafe Workshop* and *Short Training Session*, please send a message to glposm2014@gmail.com indicating your interest.

TEMPLATE

<MODELLING BIOMASS ENERGY AVAILABILITY: HOW TO INTEGRATE STAKEHOLDERS' DECISIONS?>

Author

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Conference Session

Number, title and category of the *Conference Session* chosen to submit your abstract. See on the conference webpage the updated list of accepted conference sessions and categories: <http://www.glp-osm2014.org/>

- NUMBER: 0085
- TITLE: Food, energy, climate - modeling and understanding land use change drivers across scales
- CATEGORY: Research Presentation Session

Presentation Format

Oral Presentation, Flash Talk Presentation or Poster. Note that abstracts submitted as oral/flash talk presentation can also be allocate to poster exhibition.

- FORMAT: Oral Presentation

Abstract

Clear description of the rationale and objective of your presentation/poster. Also describe how your presentation/poster is intended to contribute to the conference theme and session selected (max 400 words + 1 reference).

To limit climate change, the use of renewable energy is increasing worldwide. Biomass energy presents great development opportunities, environmental sustainability and also economic and social suitability. Biomass based energy projects are developing rapidly in forms of, for example, electricity generation plants, biogas plants or local heating plants. Biomass resources for energy can either be provided by energy crops and residues or by forest products. Biomass resource availability studies are mostly based on large scale data (national or regional scales) and take into account mostly biophysical drivers (soil types, climate, etc.). Agricultural and forest biomass availability depends also on stakeholders decision (e.g.: farmers, forest owners) regarding practices choices (e.g.: choice of the crop, wood exploitation timing). The massive use of biophysical based models to assess biomass energy potential leads to misestimates that could either harm the



food/non-food balance or the global energy supply system. The challenge is then to integrate stakeholder decisions in biomass availability models in order to describe more precisely the processes involved to assess a more realistic biomass potential and to manage to yield large scale results (Verbruggen et al., 2010). This integration raises methodological questions: on the one hand the integration of biophysical and human based processes and, on the other hand, the integration of multi-scale processes as stakeholders' decisions can be made at different level of organization (farm, cooperative, energy plant, etc) and influenced by different level of factors (farm management, global markets, etc.). Two examples of biomass availability assessment methods will then be presented. The first model deals with a perennial energy crop (miscanthus) potential spatial location and the second with forest biomass availability. The first model is based on a statistical approach (supervised learning) allowing taking into account the real miscanthus location practices of farmers. The other model is based on the comprehension of municipalities' strategies regarding their municipality-owned forest. The first method is then more generic in terms of outscaling potential. The second one is more adapted to identify lever for action that could be applied to other cases. The complementarity of those two methods to assess land use changes linked with energy issues taking into account different scales will then be discussed.

Reference:

Verbruggen, A., M. Fishedick, W. Moomaw, T. Weir, A. Nadaï, L. J. Nilsson, J. Nyboer and J. Sathaye (2010). "Renewable energy costs, potentials, barriers: Conceptual issues." *Energy Policy* **38**(2): 850-861.

Case Studies

Is your presentation/poster addressing a case study? Indicate:

- YES/NO: NO

If you are presenting a case study, you will be contacted by the GLOBE project by email (see <http://globe.umbc.edu/OSM2014>) to participate in a special GLP case study collaboration project that will be presented at the conference.