ABSTRACT BOOK

IUFRO

Interconnecting Forests, Science and People

125th Anniversary Congress 2017

125TH ANNIVERSARY CONGRESS 2017

18 – 22 September 2017
Freiburg, Germany

IUFRO

www.iufro2017.com

Theme 4: Biodiversity, Ecosystem Services and Biological Invasions

92 - Concepts and assessments of forest ecosystem services and benefits

KG I - 1010 (Uni Freiburg)

IUFRO17-1658 **Trade-offs and synergies among multiple ecosystem services under future oil palm expansion scenarios in Indonesia**

Sharma, S.* (1); Baral, H. (1); Pacheco, P. (1)

(1) CIFOR, Bogor, Indonesia

Abstract: Oil palm plantation has considerably changed the natural landscape of Indonesia in the past three decades. Sustainable oil palm productions for both domestic and global markets is pivotal to Indonesia's national economic development and for supporting smallholder growers' livelihoods while achieving climate change mitigation and biodiversity conservation goals. We assessed sustainability of oil palm landscape under five plausible future land use scenarios: Business as usual, Moratorium, Sustainable intensification of oil palm, Spatial plan, and, Optimum oil palm scenarios. Five key ecosystem services: carbon storage and sequestration, habitat quality, water yield, oil palm and timber production were assessed for these scenarios using a spatially explicit ecosystem service-modeling tool, Integrated Valuation of Ecosystem Services Tool (InVEST). The results show that except for the oil palm production other ecosystem services were diminished under the business as usual scenario whereas the sustainable intensification of oil palm, and moratorium scenarios ensured conservation of significant habitat quality areas and also increased carbon sequestration and storage. This suggests that there is scope for minimizing the trade-offs between oil palm development and conservation, yet all stakeholders involved including state and non-state actors have to understand the synergies among key ecosystem services to transition towards sustainable oil palm landscapes.

sustainability, landscapes, stakeholder, InVEST

KG I - 1010 (Uni Freiburg)

IUFRO17-807 **Quantifying and understanding spatio-temporal ecosystem services interactions in transformed forest landscapes: insights from a Patagonian biodiversity hotspot**

Locher-Krause, K.* (1); Lautenbach, S. (2); Volk, M. (1)

(1) Helmholtz Centre for Environmental Research, Leipzig, Germany; (2) Bonn University, Helmholtz Centre for Environmental Research, Bonn, Germany

Abstract: An improved understanding how ecosystem services are distributed across the landscape and how they change over time provides key information to manage multifunctional landscapes. In the south of Chile the increase of exotic forest plantation and the over exploitation of the native forest has contributed to the decrease of forest ecosystem services that provided support to local communities. We identified trajectories of ecosystem changes from 1985 to 2011 at a regional scale, in the four most important geomorphological areas. Historic land cover/land use information was used together with auxiliary data to assess selected ecosystem services with a spatial explicit model (InVEST): Provisioning (forest plantation production index), regulating (carbon storage, sediment and phosphorus retention) and cultural (aesthetic value, forest recreation) ecosystem services were quantified. While plantation production and forest recreation increased over time in all geomorphological units, regulating services showed an uneven pattern tending to decreased in time and across geomorphological units. To incorporate the demand side we defined "servicesheds" - i.e. the areas that provide a particular ES to a particular beneficiary; including local, national and global beneficiaries base on the service. We thereby not only provide base information of supply but also about its beneficiaries, crucial to manage and planning forest landscapes.

spatio-temporal, forest ESS, Patagonia

KG I - 1010 (Uni Freiburg)

IUFRO17-455 **Approaches and methods for ecosystem services assessment in the North of Portugal: from supply modeling to land management optimization**

Azevedo, J.* (1); Sil, Â. (1); Honrado, J. (2); Carvalho-Santos, C. (3); Nunes, J. (4); Péres-Rodrigues, F. (1)

(1) Instituto Politécnico de Bragança, Centro de Investigação de Montanha, Bragança, Portugal; (2) Universidade do Porto, Faculdade de Ciências, Vairão, Portugal; (3) Universidade do Porto, Centro de Inv. Biodiversidade e Recursos Genéticos, Vairão, Portugal; (4) Faculdade de Ciências da Universidade de Lisboa, CE3C - Centro de Ecologia, Evolução e Alterações Ambientais, Lisboa, Portugal

Abstract: In the last decades, ecosystems services (ES) in the North of Portugal have been assessed typically for sets of ES addressed individually based on indicators (e.g., LULC) but also through mechanistic and non-mechanistic modeling (e.g., hydrological modeling, InVEST). Economic evaluation has been applied based mostly on the combination of ES supply in biophysical units with market prices or value attributed by other techniques (e.g., avoided cost, unit value transfer). Such studies, and the approaches and methods involved, have been helpful in demonstrating the magnitude and dynamics of the supply of a series of ES in the region, both in biophysical and monetary units, and to inform regional planning and management of natural resources, such as forests. These studies have been changing the perception of stakeholders regarding forest systems and their management. Despite the importance of ES research conducted so far, there is an ongoing effort to further develop ES assessment in the region, conceptually and methodologically, namely by overcoming some of the intrinsic constraints of the approaches and methods used. Improvements intend to better integrate different ecosystem functions and services, to eliminate double counting, and to address the interactions between supply and demand of ES at several scales. The incorporation of capabilities of land-use and management optimization based on the supply and value of ES is also currently a research goal in the region. Recent developments have been based on operational research tools developed for the forest sector in the region of Bragan ça addressing ecosystem services from heuristics, multi-criteria and linear programming perspectives, expecting to solve complex spatially explicit management alternatives problems based on ES. In this presentation we will introduce these tools and their adjustment and applications in the assessment of ES in the region.

heuristics, forest ecosystem services