business-as-usual scenarios (for RCP 4.5 and 8.5), a scenario assuming tree species shift through adaptive management, a catastrophe scenario with rising impacts from storm, bark beetle infestation, and dry spells, a scenario implementing a reduction of the rotation period and a scenario aiming at the increase of the growing stock in forests. Simulations were conducted for the time period 2010-2150 including long-term forecasts for economic framework conditions until 2050 and assumptions for constant market conditions after 2050. Results help contribute to the understanding of carbon dynamics through a cascade of models comprising forest management, harvested wood products and life cycle assessments (considering material & energy substitution). Identification of critical factors helps to assess the potential contribution of the FBS to NDC. Furthermore, associated impacts on forest product markets as well as interdependencies within the FBS can be identified.

Forestry sector engagement in climate change action: the role of public and private sector in Zimbabwe

Lizzie Mujuru[1] (ID)*, Vincent Oeba[2], Mahamane Larwanou[2]*
[1]Bindura University of Science Education, Bindura, Zimbabwe; [2]African Forest Forum (AFF), Nairobi, Kenya (lzzmjr2009@gmail.com; v.oeba@cgiar.org; m.larwanou@cgiar.org)

Forests and forest products industries are a source of economic growth and employment in both developed and developing nations. A study was done to examine the role of Zimbabwean forestry sector in responding to climate change with the aim of generating knowledge to facilitate development of public-private sector partnerships. Questionnaires and face to face interviews were used to collect data from public, private and non-governmental organisations (NGOs) working in forestry. Results suggest that there was some response to climate change by public and private forest organizations and NGOs. There was however, realization of climate change and some effort to change management practices (e.g. using planting gel and species selection) although, there was uncertainty about how to adapt. Level of adaptation was low and somehow difficult to measure among key actors as existing adaptive actions were not normally documented as climate change actions. Climate change related actions were mostly limited to ways of reducing emissions in industrial operations. Forestry activities were not really focused on addressing climate change but on survival given national economic crisis. All private sector actors were not involved and had no plans for marketing and trade in forest carbon but efforts were made by NGOs to make communities aware of climate change. Main challenges to forest productivity included the poor national economy, wild fires and invasion of forests by illegal settlers. More work is needed to encourage forestry sector to focus on climate change mitigation and adaptation and promote resilience.

Carbon sequestration as a new objective in fast growing plantations' tactical management

Carlos Romero[1], Luis Diaz-Baltero[1]
[1]Universidad Politécnica de Madrid, Madrid, Spain (inv.florestal@gmail.com; carlos.romero@upm.es; luis.diaz.balteiro@upm.es)

Forest plantations can play an important role in the CO_2 removals considering this new ecosystem service in the forest management planning issues. This goal might contribute to the mitigation of climate change, considering the reduction of the greenhouse gases emissions from the harvesting operations and transportation in spatially explicit tactical planning problems. This research aims to integrate the carbon balance as a new objective for solving a tactical forest planning integrating other production criteria by resorting to multiple criteria decision making tools. The case study corresponds to an industrial forest company located in Brazil. The results reveal the marked difficulty in obtaining from an economic and forestry viewpoint good harvest schedules compatible with high levels of carbon captured.

A large-scale restoration strategy for small landowners in Brazil

Aline Soterroni[1,2], Fernando Ramos[1], Marluce Scarabello[1], Hugo Valin[2], Aline Mosnier[2], Vagna Pereira[3], Marcia Zilli[1], Wanderson Costa[1], Pedro Andrade[1], Marina Pena[4], Heloisa Ruivo[1], Rolf Simões[1], Alexandre Carvalho[4], Gilberto Câmara[1], Michael Obersteiner[2]
[1]Instituto Nacional de Pesquisas Espaciais, São José dos Campos, Brasil; [2]International Institute for Applied Systems Analysis, Laxenburg, Austria; [3]Universidade Federal de Viçosa, Viçosa, Brasil; [4]Instituto de Pesquisa Econômica Aplicada, Brasília, Brasil; [5]UN Environment World Conservation Monitoring Centre, Cambridge, United Kingdom (soterr@iiasa.ac.at; fernando.ramos@inpe.br; mascarabello@gmail.com; valin@iiasa.ac.at; mosnier@iiasa.ac.at; vagna.jp@gmail.com; marciatz@gmail.com; wcosta.comp@gmail.com; pedro.andrade@inpe.br; marina.pena@ipea.gov.br; helo_mr@hotmail.com; rolfsimoes@gmail.com; alexandre.ywata@ipea.gov.br; gilberto.camara@inpe.br; oberstei@iiasa.ac.at; pirker@iiasa.ac.at; havlikpt@iiasa.ac.at; val.kapos@unep-wcmc.org; will.simonson@unep-wcmc.org; shena.garciarangel@unep-wcmc.org; kraxner@iiasa.ac.at)

Brazil's new Forest Code grants amnesty of environmental debts for small landowners that illegally cleared their forests before 22 July 2008. Based on the Rural Environmental Registry (Portuguese acronym: CAR) from December 2016, this exemption applies to 19 million deforested hectares across country, mainly located in Atlantic Forest and Amazon biomes. We investigated the implications of this amnesty for the potential for forest restoration and associated changes to land use and emissions using the global economic partial equilibrium model GLOBIOM-Brazil. We modeled scenarios on the future enforcement of the Forest Code and its restoration requirements, with and without the small farms amnesty, and found that the area of forest restoration ranged from 12 to 31 million hectares. The different scenarios investigated included different governance in relation to the degree of control of illegal deforestation and compliance with forest restoration obligations. We estimated future negative emissions from each of these scenarios along with positive emissions from land use conversions. We assess the potential for emissions reduction of forest restoration within the land for which amnesty was granted, as well as the trade-offs with the production sector. Our results emphasize the need to design large-scale restoration policies or incentives for small landowners that could be key to enabling Brazil to fulfill its Nationally Determined Contributions of emissions reductions under the Paris Agreement.

Assessment of per capita CO_2 emission from households' fuel wood consumption in and around the forest areas of Bangladesh

Md Nazmus Sadath[1,2], Md Wasiul Islam[1]
[1]Forestry and Wood Technology Discipline, Khulna University, Khulna, Bangladesh; [2]Georg August University, Goettingen Forest and Nature Conservation Policy and Forest History, Georg-August University, Goettingen, Germany (mnsadath@yahoo.com; wasiulislam7@yahoo.com)

Forest emission reference level determination is first step in successful implementation of UN- REDD program. Fuel-wood is the most important energy source for rural households in and around the forest areas of Bangladesh, hence fuel-wood consumption is one of the major contributor to the CO_2 emission source, which needs to be accounted. However, very little to no study has been done in Bangladesh to estimate CO_2 emission from household fuel-wood consumption. This research has been conducted to determine the per-capita household CO_2 emission from fuel-wood consumption in and around the forest areas of Bangladesh. Household survey using a semi-structured questionnaire was the applied method for data collection; 500 households were surveyed in five