base florestal, a produção de biomassa, utiliza galhos, madeiras diversas, árvores quebradas ou mortas, materiais de limpeza de talhões e servem para a geração de energia térmica e vapor para geração de energia elétrica. Em uma empresa florestal brasileira, apesar de serem necessárias 5 toneladas de biomassa para suprir o potencial energético gerado por 1 tonelada de óleo BPF, o seu custo é 6,2 vezes menor (de R$386,00 contra R$2400,00 para a mesma geração de energia). Esta pesquisa analisou a influência da mistura de quatro diferentes fontes de biomassa florestal: biomassa da limpeza de áreas de pinus e eucaliptos; cavacos de madeira do mercado local e cascas oriundas do processo de descascamento de toras para celulose, para geração de bioenergia. Foram testadas diferentes misturas destas quatro fontes de biomassa e realizadas análises química imediata e elementar e o poder calorífico inferior de cada composição. Os resultados estatísticos não apresentaram diferenças significativas para as diferentes composições de produtos, o que demonstra a viabilidade do atual sistema de geração de bioenergia.

C7d: WILL ACTIVE RESTORATION OF SECONDARY AND DEGRADED FORESTS (SDFS) HELP TO ADDRESS SUSTAINABLY THE GAP BETWEEN WOOD DEMAND AND SUPPLY?

Phenomenological modelling scenario of future wood demand by 2050

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For the last 5 decades, the main factors of the world timber demand are the construction dynamics, the demographics, the user's income, the price and availability of wood products relatively to alternative materials, and regulations and policies. We measured the long run demand elasticities the major regions of the world, and built phenomenological models which can predict the wood demand up to 2050 with known errors. For the prediction of the wood demand until 2050, factors such as GDP and prices which would only rely on arbitrary scenarios, are discarded, and we measure how much of the variability of the wood demand can be predicted from phenomenological and robust variables such as demographic factors. We find that wood demands of the tropical regions (Latin-America, Sub-saharan Africa, and Tropical Asia) can be reliably modelled with good prediction errors bellow ± 13% to ± 24%. Conversely, the demand models of the temperate regions where the wood dynamics are more linked with the discarded variables, are less precise and their prediction errors escalate up to ± 60%. We find that, by 2050, tropical regions will demand between 800 and 1100 million m^3 of wood per year, with 95% of confidence. Until now most of the demand by tropical regions was met by a local production, totalling around 500 million m^3 per year in 2016. Our findings raises the question of how, by 2050, tropicalforests would be able to sustainably produce the double of what they produce today ?

Different contexts, same concerns? Wood gap and forest restoration in Indonesia and Cameroon

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The gap between demand and supply of sustainable wood, in countries rich forest with a poor governance, is one of the major causes of forest degradation. This phenomenon, which is combining with other major forest degradation causes as agriculture and fires, should not be overlooked as it results in dire deforestation. In Indonesia, uncontrolled development of wood industries, led to a growing wood demand disconnected with sustainable forest management capacity. This started in 70s with log exports development, followed by the plywood industry in the 80s', pulp and paper in the 90s' and the forest conversion to agro-plantations. Tree cover in permanent forest lands dropped from 113.1 million ha to 87.4 million ha, or by 23% in 34 years, from 1982 to 2016. In Cameroon, the growing demand for timber is accelerated by domestic market paired with the population growth above 2.5% per year. Domestic timber and firewood are sourced from poorly managed non-permanent and permanent forest. The rate of deforestation at the national level remains low (0.2 % per year), but deforestation is rapid around cities and along roads. Comparing the two countries, some similarities have been identified, 1) in each case wood gaps are filled by illegal practices, 2) there are miss-perceptions about sustainable wood supplies from forests, 3) governments are now planning forest restoration and 4) low woodprices are discouraging investment into forest plantations, secondary forest silviculture and forest restoration. Finally, we compare how, governments are addressing wood gap and forest restoration.

Can a tropical rainforest destroyed by wildfire and logging recover by rehabilitation with enrichment planting and assisted natural regeneration?

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In a carbon emission and biodiversity perspective there is a great demand for rehabilitation of extensive parts of the tropical rainforest (TRF), degraded by repeated timber harvesting or wildfire. In such forest in Sabah, in the north of Borneo burned during the El Niño droughts in 1983-84, the Swedish company IKEA and Yayasan Sabah in 1998 started investing in a rehabilitation planting under mostly pioneer canopies, dominated by *Macaranga* species. Twenty years later an area of 10,600 ha has been planted with in total 90 tree species, mainly of the Diptercarpaceae tree family and some wild fruit species. The more well-stocked land has got the treatment of Assisted Natural Regeneration (locally called "Liberation"). The planted area has been improved by "line planting" or "gap- cluster planting" with a density of between 200 and 400 seedlings per ha depending on land suitability for planting. Maintenance period for the planted seedlings has been up to 10 years. During the last 10 years several experiments and permanent plots has been established. The average survival after 10 years is between 20 and 50%, but remnant seed trees, have added new seedlings to most plots. Several of the planted species have already started producing seeds. The largest tree, aShorea leprosula, planted 1998, had a diameter of 64 cm at age of 20 years. The survival and growth rates vary because of temporal variations, in rainfall and wildlife predation and variations in light at the forest floor, soil conditions and genetics.