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Uses and functions of tropical forest peatlands in the Congolese basin (DRC) : between global climate issues and exploitation of resources by local populations

Dieu Merci ELUO¹, Hervé PARMENTIER², Hervé CUBIZOLLE¹

¹ Laboratoire EVS Isthme, Université Jean Monnet de Saint Étienne, UMR 5600 CNRS Environnement, Ville, Société, 6 rue Basse des Rives, 42023 Saint-Etienne cedex 2 ; eluodieumerci@gmail.com ; herve.cubizolle@univ-st-etienne.fr

² École Normale Supérieure de Lyon, Pôle de la Recherche, plateforme Ingénierie Spatiale, Image et Géomatique (ISIG), UMR 5600 CNRS Environnement, Ville, Société ; herve.parmentier@ens-lyon.fr

INTRODUCTION :

The Congo Basin tropical rainforest covers an area of 172 million hectares, the second largest rainforest on the planet after the Amazon. It is in international news because of the role of CO₂ reservoir of peatlands discovered by Congolese and English researchers (Leeds) in 2014. This important carbon reserve of 30 and 40 billion tonnes and covering 142,000 km², represents 03 years of global CO₂ emissions, or 20 years of US CO₂ emissions. The challenges of this forest therefore justify its protection for the benefit of all humanity; these spaces nevertheless also constitute a vital area for the indigenous populations who have lived there for millennia. My doctoral studies, carried out at the University of Lyon (Fr), concern the uses by local populations of forest peatlands in the Congolese basin (Lokolama). They are part of a broader reflection on the current and future management of this peat ecosystem, in order to guarantee its functionality and its hydro-socio-ecological sustainability on the one hand, and to ensure a decent life for local populations on the other hand. Our participation in COP 28 consists of highlighting the services provided by these peatlands to indigenous people but also to all of humanity: carbon storage, biodiversity reserves, regulation of river flows, etc.

SOME BIOGEOLOGICAL CHARACTERISTICS :

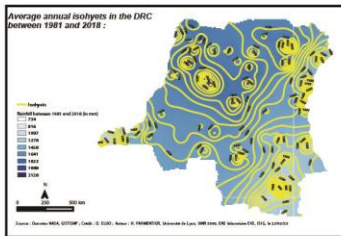


Fig 3 - Average isohyets of the Congo Basin

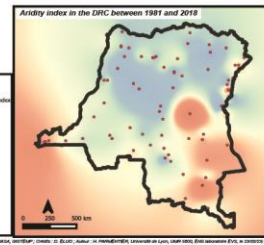
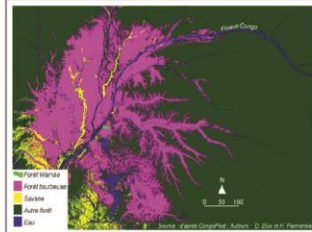


Fig 4 - Aridity index in the Congo basin

The aridity index map of the DRC places my study area in the index interval between 41 and 60 (humid in blue on the map). The "dry" zone is rather located in the south-eastern part of the DRC

PEAT TROPICAL FOREST - LOCATION, COLLECTION AND INTEREST



Forests help slow climate change: in 2019, global human-caused greenhouse gas emissions were around 48 gigatons (Gt) of CO₂. Each year, forests sequester around 16 Gt of carbon dioxide (CO₂). When the forest disappears, the CO₂ stored in the trees and the soil is partially released.

Fig 2 - Peat forest in the Congo basin



Collecting peat cores in the forest requires a thermal engine or manual auger and insulating bags for their conservation. Peat is defined as having an organic matter content of at least 65% and a minimum depth of 30 cm (Dargie et al. (2017). Access, progression, and transport of material in these environments are not simple and easy.

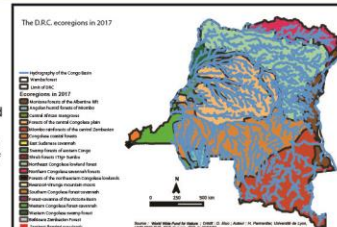


Fig 5 - Ecoregions in the Congo Basin

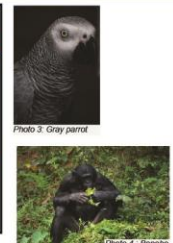


Photo 3: Gray parrot

Photo 4: Bonobo

FUNCTIONS AND USES OF THE CONGOLESE PEAT FOREST

CLIMATE REGULATION FUNCTION:

* On a global scale:

Carbon storage by accumulation of peat; limitation of greenhouse gases; fight against climate change; compliance with the objectives of COP 26 in Paris. Peat from the central Congo basin stores around 30.6 petagrams of carbon (roughly the equivalent of 20 years of carbon emissions in the United States). (C. G. Dargie) An increase in temperatures and a decrease in rainy days can therefore have negative consequences on variations in biomass production, the dynamics of renewal, the growth of peatlands and their storage capacity, as well as an impact on the biodiversity of plant and animal species.

* On a regional scale:

Participation in the currents and precipitation of the intertropical convergence zone.



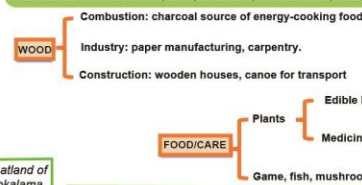
Source : J.C Cannon, 2021/12/20

Congo peatlands and local communities



Peatland of Lokolama

SUPPLY FUNCTION: wood, food, medicine, construction, ornaments.



ENVIRONMENTAL PRESSURES :

Climate change, deforestation, shifting agriculture, oil-gas infrastructure, mining, poaching, conflicts of use (wood and water resources, fishing and hunting areas), land conflicts (title ownership and conflicts between ethnic groups), tropical diseases due to the promiscuity of humans with disease-carrying wildlife.

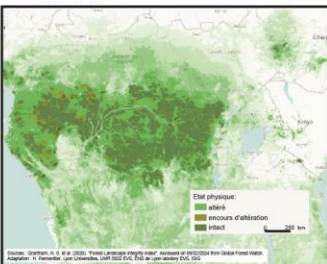


Fig 6 - Forest landscapes from 2000 to 2016 (FL)

The objective is to protect, restore and promote the sustainable use of ecosystems-land and forests, to stop and reverse the degradation and put an end to the loss of biodiversity.

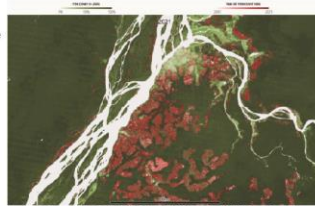


Fig 7 - Shifting agriculture (North DRC) Tree cover in 2000 and cumulative tree loss, 2001-2021

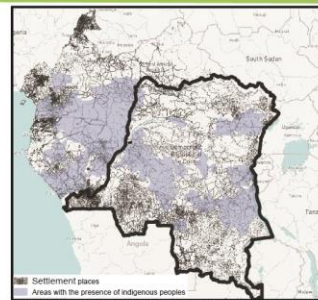


Fig 8 - Distribution of settlement places in 2013. (https://data.mappingfront.org)

Administrative areas with the presence of indigenous peoples (gray on the map) represent less than 100,000 people according to the UN in 2013. The Congolese population was at 5.5 million in 2020 with an annual growth rate of 3.68%.

Mapping community



PROJETS & PERSPECTIVES :

Requests and wishes of indigenous peoples:

The pygmies of the Lokolama peat forest have expressed their concerns about the government's desire to dispossess them of their forest due to the financial problems inherent in the peatlands. They believe that they are not involved in discussions concerning their rights to the sustainable management of these natural forest resources and that all decisions taken on their management are always imposed. They would also like to benefit from compensation in recognition of the protection guarantee of this peat forest. They also demand a substantial improvement in their living conditions as well as effective participation in discussions on ecosystem management as well as decent education and care through the construction of a school and a dispensary. Finally, they demand the electrification of the village and housing made from semi-durable or durable materials.



Photo: © D. ELUO, 04/09/21



Photo: © D. ELUO, 04/09/21

CHALLENGES & CONCLUSION :

As part of my thesis, the work launched in 2024 is as follows:

- The implementation of field investigation phases.
- The future organization of a workshop in France (Lyon) for scientific exchanges about peats in Lokolama forest)
- Participation and sharing information and methodological structuring towards an observatory project and valorization of practices and ecosystem services (forest, soil, water) and a metadata base.
- What do we propose at the regional and national level:**
 - Create commissions for the protection and enforcement of human rights and environmental towards sustainable development integrating strong participation of Pygmy indigenous peoples. Integrate this populations through a center research into the valorization of forest products or an academic establishment management of land and natural resources in the Democratic Republic of Congo.
- At an international level :**
 - Propose the design and creation of a fund and project monitoring tool for the climate and local populations by UN member countries.

