Oil Exploration in the Peatlands of Democratic Republic of the Congo

A briefing from the CongoPeat international team of scientists

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The sale of oil exploration rights in the rainforests and peatlands of the Democratic Republic of the Congo (DRC) is being reported, with concern about the impacts. Here we summarise the potential impacts.

GLOBAL IMPORTANCE OF THE PEATLANDS

- The central Congo peatlands are the world's largest tropical peatland complex, covering 16.8 million hectares, 15% larger than previously thought. Two-thirds of this peatland, 11.3 million hectares, is in the DRC.
- The central Congo peatlands are some of the world's most carbon dense ecosystems. They store 29 billion tonnes of carbon in the peat, equivalent to three years' global emissions from fossil fuels. Two-thirds of this carbon, 19.6 billion tonnes, is in DRC.
- Following land-use change, some other tropical peatlands have become a major source of carbon, including fires large enough to be detectable in the historical record of atmospheric carbon dioxide. If the Congo Basin peatlands suffered the same fate, this could threaten international agreements to limit global warming under the Paris Agreement.
- The swamp forests that overlie the peat are some of the world's richest forests for wildlife. Major populations of forest elephants, bonobos, Allen's swamp monkey and the African dwarf crocodile are found there.

IMPACTS OF OIL EXPLORATION

- Overlaying a forest map and the 16 oil blocks originally proposed for auction in DRC (this has been increased to 27, but maps are not available for these at the time of writing 22 July 2022) shows 11 million hectares of rainforest covered by the oil concessions, including some protected areas, see Fig. 1.
- Overlaying our new peat map and the 16 oil blocks originally proposed for auction, shows 995,100 hectares of peatland within three oil blocks (4, 4B, 22), shown in Fig. 2.
- Wildlife, including elephants and great apes, is at risk from oil exploration as cutting access lines to survey the peatlands for oil opens the forests, leading to greater hunting pressure in previously inaccessible swamp forests.
- Deforestation will increase. Oil exploration opens the forests and peatlands, which typically leads to illegal hunting and logging leading to degradation, whether oil is found or not. Degraded forests are then prone to fire and targeted for deforestation following salvage logging and charcoal production.

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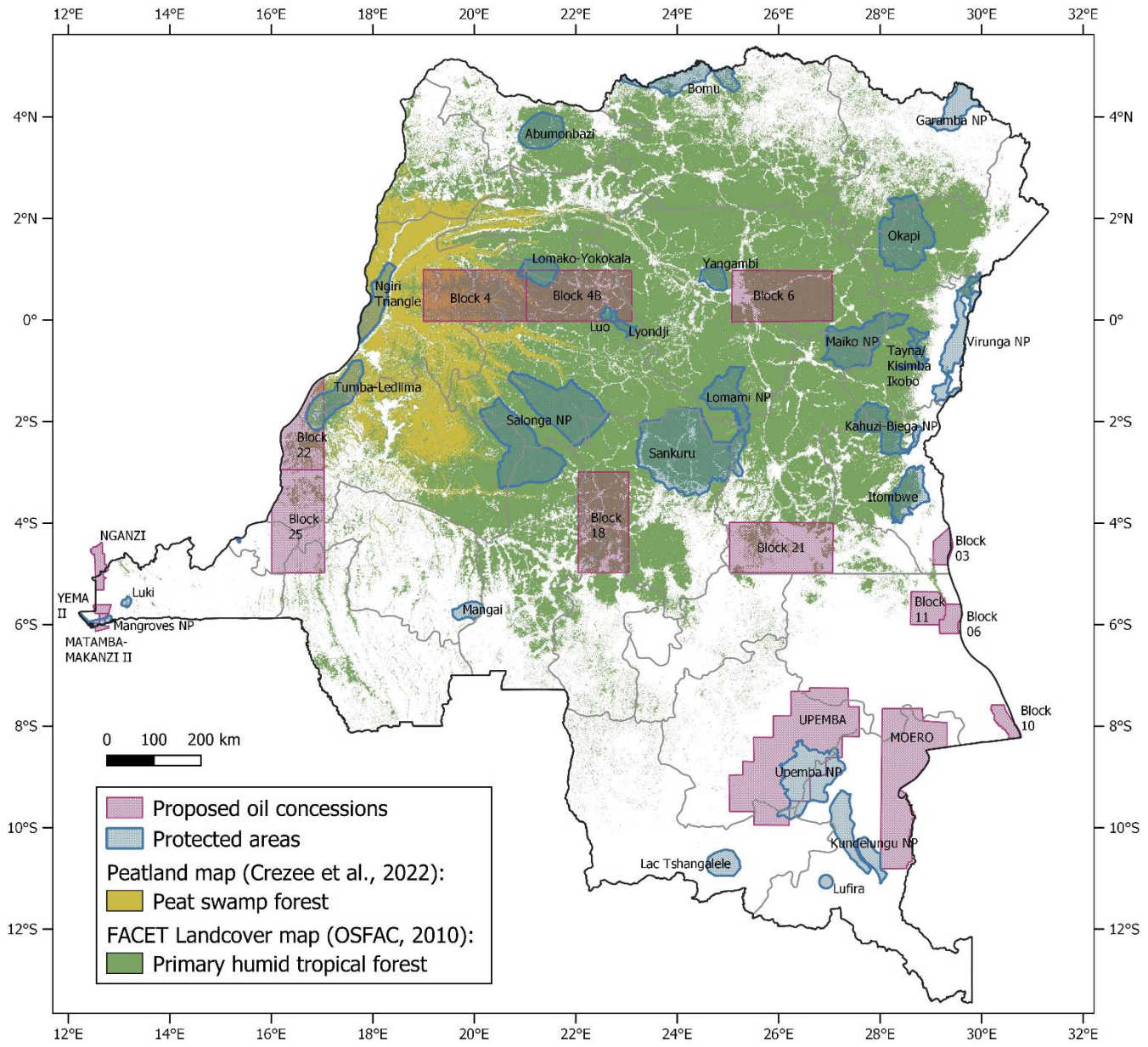

Fig. 1. Map of tropical rainforest, tropical peat swamp forest, oil concessions and protected areas.

IMPACTS OF OIL DRILLING

- In the exploration phase, and particularly the drilling phase, infrastructure development, including seismic access lines, roads, pipelines, and the infrastructure needed for workers, can easily alter the drainage patterns of the peatlands, and lead to disturbance of the peatland ecosystem and the release of the carbon they contain. This can be seen in two photos, before and after road building over a peatland area, in Fig. 3.

- Any contamination of the environment of the peatlands, from oil spills, or contamination by toxic production water (a wastewater by-product of oil production), may spread much more widely that in other terrestrial environments. This is because every patch of peatland is connected to every other by water. Evidence from oil exploration and drilling in rainforest and wetland environments in Nigeria's Niger Delta and the Peruvian Amazon show widespread pollution negatively affecting people and the natural resources including water, fish and other wildlife upon which they depend. In one study, 98.6 percent of children living in an oil production zone exceeded the safe limits for cadmium in their blood.

- The high absorption and adsorption capacity of organic matter in peaty soils may lead to long retention of contaminants where the spillage occurred, and the anoxic and nutrient-poor conditions slows the microbial degradation of oil. The result is any pollution will be more difficult to remediate than in other environments.

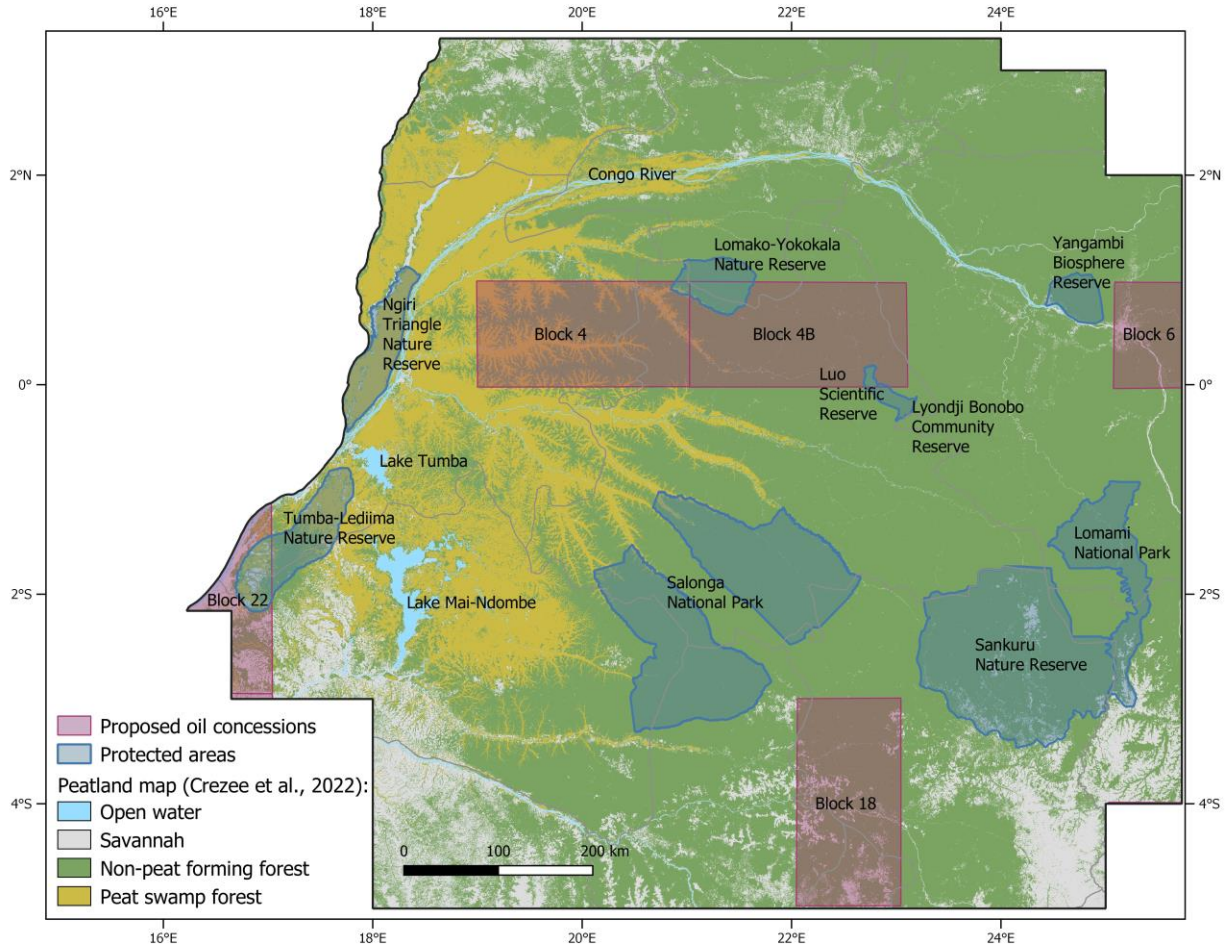

Fig. 2. Peat swamp forests and oil exploration blocks. Blocks 4, 4B and 22 contain peat.

CARBON IMPACTS OF OIL EXPLORATION AND DRILLING

- Using published estimates of the carbon stocks of DRC's rainforests, we estimate that the 11 million hectares of closed canopy tropical forests in 16 oil exploration blocks store 1.47 billion tonnes of carbon. This is equivalent to the carbon emitted by burning 12.5 billion barrels of oil[1].
- Using our new maps, we estimate that peatlands within the three oil blocks store 1.62 billion tonnes of carbon. This is equivalent to the carbon emitted by burning 13.8 billion barrels of oil.
- Should forest and peatland disturbance occur and carbon be released, any oil produced from these lands would be some of the most carbon intensive oil ever mined. Combining this carbon release with that from the oil would result in a total carbon impact greater than that of burning coal.

[1] Using reference value of 0.43 tonnes carbon dioxide per barrel of oil, from https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references#

Fig. 3. Top photo, taken in 1989, light green is inundated swamp forest, which we identify as peat swamp forest; dark green is terra firme rainforest; road and logging camp are brown coloured. Bottom photo, taken in 2018, the same location, where changes in the drainage appear to have killed the peat swamp trees, and is now releasing carbon to the atmosphere.

NEXT STEPS REQUIRED

- Urgent data collection, analysis and modelling is required to understand the likely impacts of oil development in the peatlands, as little is known about the potential impacts of oil development in the peatlands. This research should be prioritised before deciding on potentially irreversible changes to the peatland system by oil exploration.