



SIMANDOU PROJECT: RISKS AND IMPACT ON CLIMATE CHANGE



Guinea is already feeling the effects of global climate change, that will only be exacerbated by greenhouse gas emissions and deforestation involved in large-scale mining projects such as Simandou. This alert note sums up the risks and impacts of the project on climate change and provides clear recommendations to companies to ensure their operations are consistent with Guinea's climate commitments.

THE SIMANDOU PROJECT AT A GLANCE

Nestled in the forested mountains of Guinea in West Africa lies what is reportedly the world's biggest untapped high-grade iron ore deposit. One of the continent's most ambitious combined mining and infrastructure projects, the Simandou project covers a total area of 1,500 square kilometers where ore will be extracted, processed and then transported 650 kilometers along a rail line cutting through the country's endangered species habitats, agricultural lands and protected areas before finally arriving at a new deepwater port in local fishery areas for export.

Coveted by international mining companies for decades, today's project proponents include two consortiums: Australian mining giant Rio Tinto with Chinese aluminum producer Chinalco (Simfer) and China's largest aluminum producer, Hongqiao with a Singapore-based entity Winning (Winning Consortium Simandou or WCS). News reports indicate China's largest steel maker, Baowu, is in talks with both consortia. Construction has started on the rail line and port – estimated to cost USD 13 billion to build – held by the two consortia and the Guinean government, and on the WCS blocks. Rio Tinto is in the process of updating its studies in order to start construction.

THE SIMANDOU PROJECT'S CLIMATE CHANGE IMPACTS

A mining project the size of the Simandou project in a densely forested area will have far reaching impacts on climate due to greenhouse gas (GHG) emissions. Climate impacts from mining come not only from land use changes from deforestation to clear the mining area, build new settlements and energy infrastructure, but also from the use of explosives, the lost carbon stock, and the energy generation for ore processing, transport and transformation into steel. Steel production is a particularly high emissions industry, which was directly responsible for about 7% of global emissions in 2020.

CURRENT CONTEXT OF CLIMATE CHANGE IN GUINEA

Guinea is already feeling the effects of global climate change, impacts that will only be exacerbated as temperatures continue to rise.

- Droughts are the highest climate risk in Guinea and are expected to become worse; their increasing intensity and frequency will directly threaten food security, diminish productivity of crops and subsistence farming, increase water insecurity, increase the loss of biodiversity, and increase the incidence of bushfires.
- Guinea faces rapid rates of deforestation. Between 2001 and 2021, Guinea lost 23% of its tree cover, amounting to 1.86 million hectares of forest loss and 797 megatonnes of CO₂-equivalent (CO₂e) emissions. According to Global Forest Watch, Guinea's Nzérékoré region, the location of the Simandou project, experienced the highest rate of deforestation in the country between 2001 and 2021.
- Guinea's coastline is impacted by rising sea levels, which will cause an increase in salinisation, flooding, and infrastructure damage. The flooding associated with sea level rise will also lead to loss of human life, loss of crops, and the spread of waterborne diseases.



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The Republic of Guinea has enshrined commitments to anticipate, prevent and mitigate climate change causes and impacts domestically in its Environmental Code, and ratified both the United Nations Framework Convention on Climate Change and the Paris Climate Agreement

CLIMATE IMPACTS ALREADY FELT FROM THE SIMANDOU PROJECT

While it is early to gauge the climate impacts from a project that remains at an early construction phase, the deforestation and land use conversion underway by WCS surpasses what was planned in the Environmental and Social Impact Assessments (ESIAs).

HIGH CLIMATE RISKS OF THE SIMANDOU PROJECT

The main risk is that the two companies involved in the Simandou project will not respect their environmental and social commitments: they are part of groups of companies that have already violated such commitments concerning projects in Guinea and elsewhere in the world. This is the case for Winning in Guinea, according to reports by the [International Federation for Human Rights](#), [Natural Justice](#) and [Human Rights Watch](#); and for Rio Tinto in Guinea, according to a complaint to the World Bank's [Compliance Advisor Ombudsman](#), and in [other countries](#). More specifically, the risks are as follows:

1. SUBSTANTIALLY UNDERESTIMATED GHG EMISSIONS

According to scientist Mark Chernaik, a preliminary analysis of WCS's ESIA on Blocks 1 and 2 of the Simandou project reveals that the tonnes of CO₂ equivalent (tCO₂e) value from mining is an underestimate, because it:

- failed to accurately include emissions from changes in land use, including loss of vegetation and soil disturbance. WCS likely underestimated the emissions value of 19,066,716 tCO₂e. Even though this value is an underestimation it would still be equal to about 41% of Guinea's total emissions in [2020](#).
- is based on inaccurately low estimates of the forested land that would be cleared for the project and of the carbon stocks they hold.
- failed to include emissions from wood rot of cleared forests. The ESIA's total emissions projections opts not to include 271,300 tCO₂e from cleared woods on the basis that this wood would be preserved rather than left to rot. However, it is unrealistic to assume so due to the remoteness of the mining location, and these values should be included.
- failed to take into consideration the carbon sequestration rates that would be lost due to land clearing.

2. THE FICTION OF "GREEN STEEL"

- The project promoters have claimed without evidence that the very high purity of Simandou's iron ore will allow the iron to be transformed into steel in a carbon-neutral manner. In theory, iron ore with an iron content above 67% could facilitate a type of zero carbon hydrogen based refining known as direct reduced iron (DRI). However, the vast majority of Simandou's iron ore is not of sufficient purity to be used in DRI processes. Additionally, steel cannot be considered "green" if the iron ore is mined using fossil fuels as an energy source, as is the case of the heavy fuel oil power plant proposed by WCS.



3. Heavy fuel oil power plant and diesel run locomotives

To meet the mine's energy needs, WCS plans to build a 40 MW heavy fuel oil power plant, emitting large amounts of GHGs that will make up about 25% of the stated estimated emissions for its part of the project. ELAW scientist Mark Chernaik recommends that the power plant be abandoned in favor of alternative means of generation, specifying that the power generated should count as primary rather than secondary emissions.

The locomotive trains that will transport ore from the mine to the port will be run on diesel fuel. Diesel locomotive engines are a major contributor to air pollution. The culprits are NO_x and SO₂ and will cause an array of health and environmental problems. Nitrogen dioxide (NO₂) is 240 times more destructive to the ozone layer than carbon dioxide. The acid rain caused by SO₂ wreaks havoc on fragile ecosystems.

4. No prioritization of renewable energy

Wind energy is likely a viable alternative form of power generation for the mining site, as noted in the ESIA. Although wind power would be a lower GHG emissions form of energy generation, the ESIA fails to consider using wind turbines to avoid and mitigate impacts such as interference with some species of birds and bats, or noise pollution. WCS is in full control of where the wind turbines would be placed, allowing them to avoid adverse impacts due to location.

CONCLUSIONS AND RECOMMENDATIONS

- WCS and Rio Tinto should properly account for the full, lifecycle climate change impacts of their operations (Scopes 1, 2, and 3) and ensure that their operations are consistent with Guinea's Nationally Determined Contributions under the Paris Agreement. (Scope 1 emissions, or direct emissions, include all emissions from what the company owns or controls. Scope 2 emissions, or indirect emissions, include all emissions from the energy the company buys and scope 3 emissions are those from other parts of the product value chain including those emitted from the consumer of the product).
- WCS and Rio Tinto should publish revised climate change impacts assessments that 1) take into account ELAW's critiques of the climate change sections of WCS's ESIA - including but not limited to the need to reflect GHGs caused by land-use change and deforestation; and 2) provide analyses of Scope 3 emissions, including an independent analysis of the project's green steel claims.
- WCS and Rio Tinto should commit to using renewable energy sources and smart-grid technology for any newly installed electrical generation, transmission, and distribution capacity related to the project.
- All project promoters should commit to avoiding deforestation and comply with the Guinean Forestry Code.

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