Managing mining project impacts on a community in the context of high levels of biodiversity and the presence of established ASM – a case study from West Africa

D. LIMPITLAW[1], F. CESSFORD[2] & J. NJUMA[3]

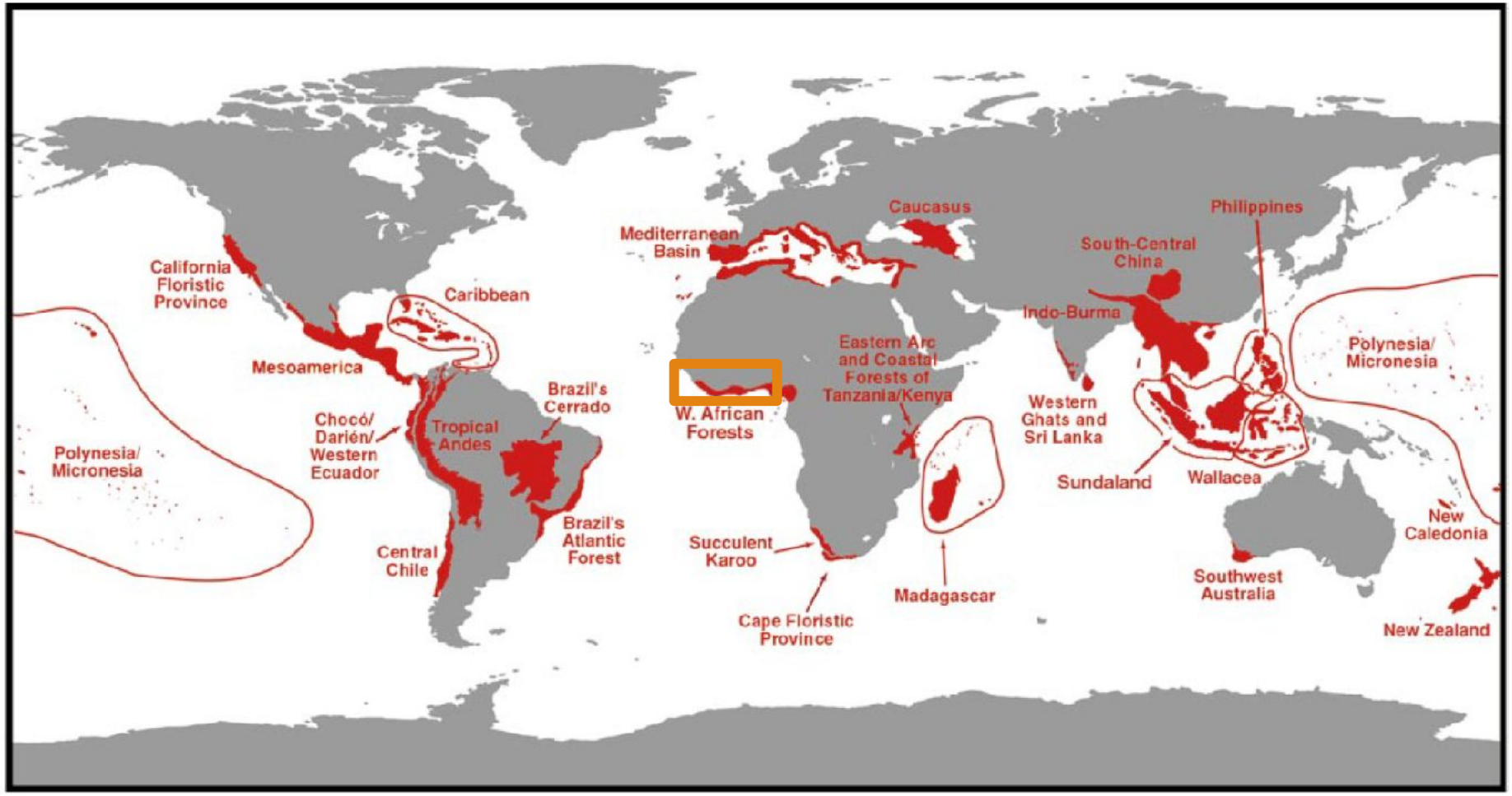
1. SCHOOL OF MINING ENGINEERING, UNIVERSITY OF THE WITWATERSRAND
2. SRK CONSULTING UK LTD
3. PASOFINO GOLD LTD.

srk consulting

PASOFINO GOLD

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

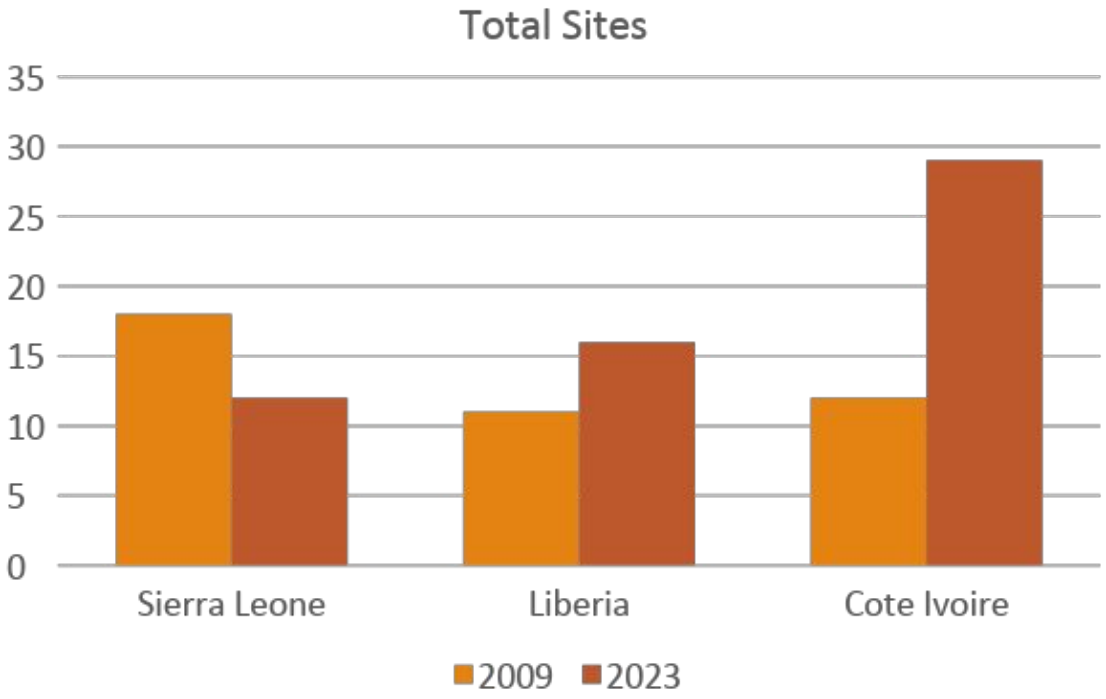
Global Biodiversity Hotspots

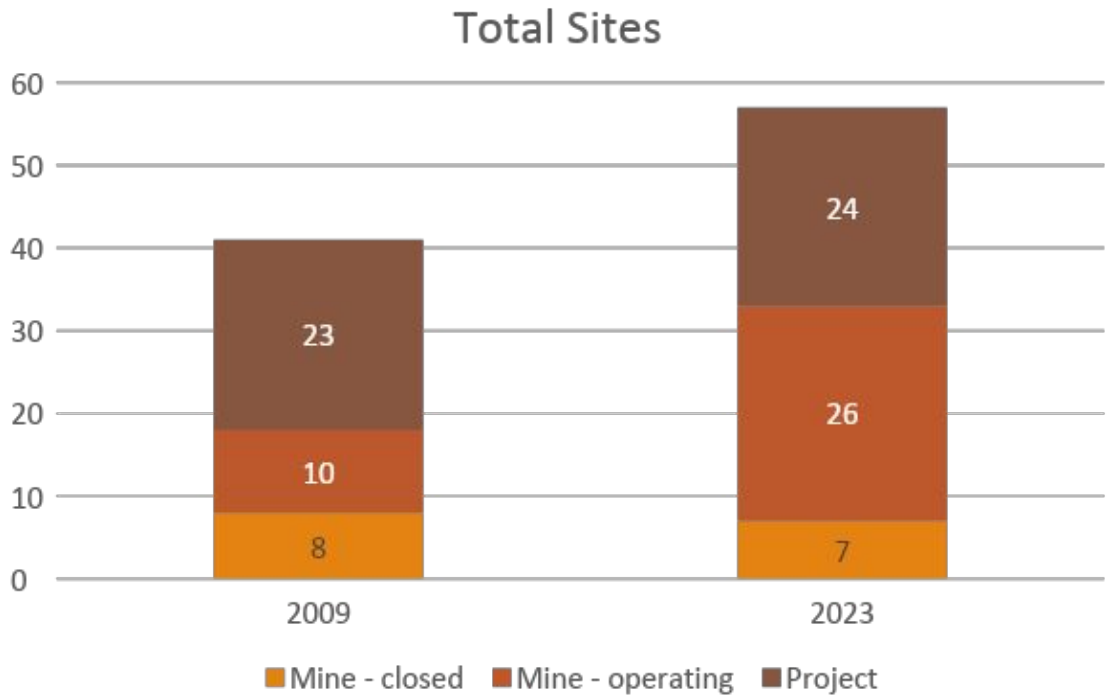


The 25 hotspots – Myers *et al*. (2000)

Mineral resources are present in all areas of significant biodiversity and conflicts between mining and conservation are expected to increase (Sonter *et al*., 2018)

Increasing Footprint in Biodiverse Countries (West African Coastal Forests Hotspot)





In some instances, even the best site-level management cannot sufficiently ameliorate biodiversity impacts and offsets are required to address the residual losses (Sonter *et al*., 2018).

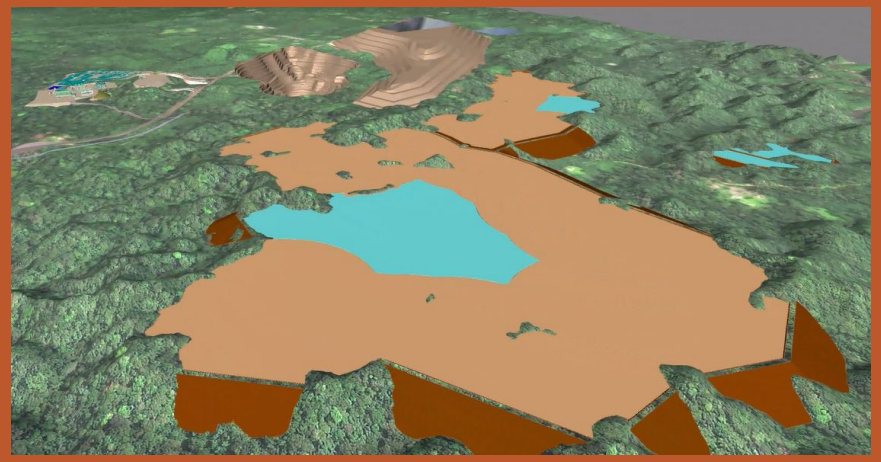
Data: Intierra Mapping & Mining Journal (2009) West Africa Mining and Exploration Activity Map
SEMS Exploration (2023) West Africa Geology and Projects Map – Focus on Nigeria

West African Case Study: The Dugbe Project

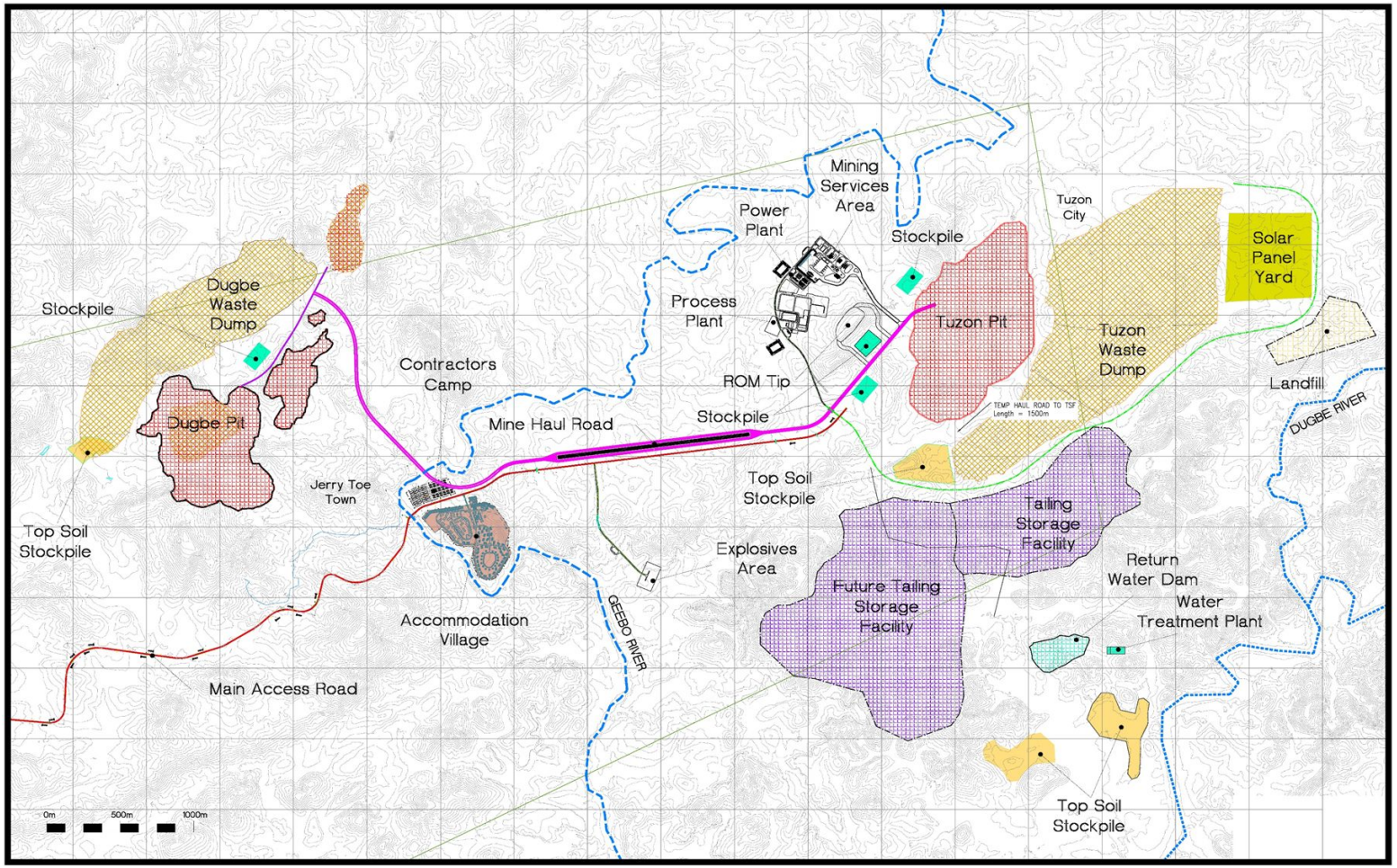
- The Project is in an undeveloped area of south-eastern Liberia, approximately 30 km inland of the Atlantic Ocean and 60 km east of the nearest large town (Greenville)
- The area is sparsely populated with limited access to infrastructure and services; a legacy of civil war
- Livelihoods rely on artisanal mining, hunting or small-scale farming
- A tropical climate, with existing rainfall (2.7 m/a) predicted to increase with climate change
- The Project falls within the Guinean Forests of West Africa Biodiversity Hotspot, the Upper Guinea Forests Endemic Bird Area and the Guinean Moist Forests Global 200 Terrestrial Ecoregion and overlaps or lies close to Important Bird Areas and Key Biodiversity Areas
- Sapo National Park is ~ 15 km north of the mine and the proposed Grand Kru – River Gee Proposed Protected Area is 10-20 km southeast

Project Outline

- 2.27 Moz gold produced over a 14-year LOM.
- Average annual production of 200,000 koz for the first 5 years.
- No pre-strip required and low strip ratio ~ 4.5:1
- Two open pits (Tuzon and Dugbe F) ~4 km apart final depth ~350 m
- The GISTM-compliant TSF is designed to store 65Mt of tailings over the LOM at 5Mtpa, covering 260 ha
- WRDs: Tuzon (109 Mm^3) and Dugbe F (39 Mm^3); Dugbe F pit is partially backfilled
- Solar farm: 16 MWp, constructed on WRD
- 76 km road from port of Greenville for construction
- Approximately 5,000 people live in the vicinity of the project



Dugbe Project DFS Site Layout



Direct and indirect impact to critical habitat requiring biodiversity offsets to achieve nature positive situation

Presence of artisanal and small scale miners and relationship of these to local communities

High community expectations around opportunities for shared value

Need for resettlement and livelihood restoration

Unavoidable greenhouse gas emissions requiring offsets

Potential for rapid influx of job seekers, ASM and illegal timber harvesters

Challenges

ASM in the Project Area in 2022

- ASM Permanent miners: 243
- ASM Permanent Directly Affected Population: 1,415
- ASM Seasonal miners: 1,429
- ASM Seasonal Directly Affected Population: 8,324
- ASM sites: 197
- The first social baseline (2013) reported that 40% of households relied on ASM to some degree

Management Objectives: ASM

- Comply with national legislation and good international industry practice
- Work collaboratively and in partnership with ASM site owners and workers, and with communities benefiting directly or indirectly from ASM-related activities
- Achieve zero harm from site-related impacts that may affect the health and safety of workers at current and future ASM sites
- Maintain the livelihoods of owners and workers of current ASM sites (where these choose to continue with ASM activities rather than changing livelihoods)
- Assist ASM site owners and workers in formalisation and professionalisation efforts as a key contribution to improving technical and environmental performance
- Contribute to improved health, safety and wellbeing of workers at current and future ASM sites
- Support the transition of current ASM-related practices to forest-smart practices that avoid or minimise adverse impacts on forest and biodiversity resources

Sustainable Forest Management

SFM is a means of supporting local to regional scale socio-economic development, biodiversity conservation and climate change mitigation in an integrated manner, building on the principles of sustainable development to promote community and conservation focused forest management

Management Objectives: Sustainable Forest Project

- Increase sustainable timber production over a logging cycle, with benefits accruing to those directly impacted
- Limit illegal timber harvesting
- Integrate direct biodiversity gains through a landscape connectivity approach
- Monetise carbon sequestration for the benefit of those directly impacted – a cash alternative to ASM
- Support and diversify community income sources in remote areas
- Link with the REDD+ mechanism – path to achieving goals without establishing strictly protected areas
- Offset project biodiversity and greenhouse gas emission impacts

Additional Management approaches:

Physical and economic displacement necessary, with high community expectations

- Resettlement policy framework to guide eventual RAP process and ASM action plan developed; alternative livelihoods developed through a sustainable forestry project

Located in areas with high biodiversity sensitivity, important ecosystem services and some sensitive soils (wetlands)

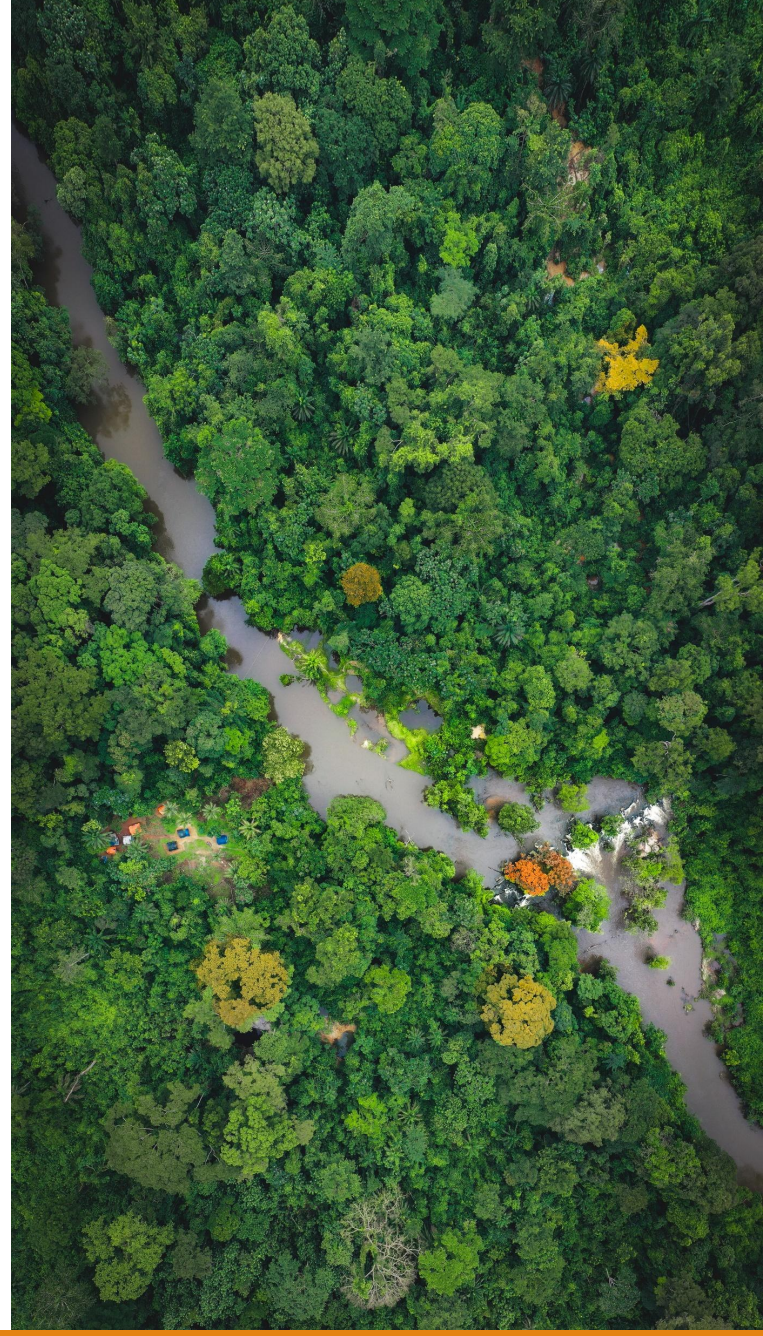
- Project layout adjusted to avoid these areas as far as possible; biodiversity and soil management plans developed; fully lined TSF with treatment of decant water

Conclusion

The environmental legacy of mining remains a major, if not the biggest hindrance, to the sustainable development of the minerals sector worldwide (Domingo et al., 2024).

To address this challenge, the Dugbe Project included a sustainable forest project designed to meet biodiversity off-sets around the site without resorting to a “fortress conservation” approach:

- The SFM project: allows select harvesting of trees under community control and directly benefits communities, and can avoid business-as-usual deforestation, maximising the co-benefits of carbon storage and biodiversity preservation.
- Preliminary calculations for an offset of 120,000 ha, show that the value of carbon emissions reductions over 16 years could be of the order of USD 45 M (based on 3.2 Mt of carbon sequestered). After costs of USD 36 M, the offset could be net positive to the value of over USD 9 M.



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