

ANALYTICAL REPORT

# CO2lonialism Ecocide Reparations

Colonial Ecological Damage in Africa and the Case for a  
Harmonised Reparations Methodology

**1 Precedents & Law**

Reparations practice and the new international law of ecocide

**2 Five Country Cases**

Nigeria, Ghana, Senegal, Uganda, South Africa

**3 Harmonised Method**

Toward a jointly agreed African Union benchmark

**4 Recommendations**

A ten-point way forward for a technical working group

NOG

## About this report

This report is a product of an ongoing research programme on colonial economic and ecological history in Africa, undertaken under the direction of Professor J. G. Nkem Onyekpe, Head of the Department of History and Strategic Studies, University of Lagos, and Lead Consultant at NOG Konzultants. The Center's work combines historical, economic, and environmental analysis with the aim of supporting an evidence-based case for reparation for the full range of harms inflicted by colonial rule in Africa.

**Please cite this report as:**

Onyekpe, J.G.N. (2026). *The Uncounted Ledger: Colonial Ecological Damage in Africa and the Case for a Harmonised Reparations Methodology*. Round Table Report. Lagos: NOG Konzultants.

© Professor J. G. Nkem Onyekpe, PhD; FHSN (July, 2026)

Head, Department of History and Strategic Studies, University of Lagos, Akoka, Lagos

Lead Consultant, NOG Konzultants, Akoka (Lagos): Agbor & Ejeme-Aniogor (Delta)

+234 803 401 9418 · jonyekpe@unilag.edu.ng · nkenchonyekpe@yahoo.com

## Acknowledgements

The authors acknowledge the assistance of research support staff at NOG Konzultants in the collation of secondary sources for the Senegal case study and the methodological review, and thank colleagues at the Department of History and Strategic Studies, University of Lagos, for comments on earlier drafts of the Nigeria, Ghana, Uganda, and South Africa case reports.

# Contents

---

A guide to this report's structure: precedents in international reparations practice, five national case studies of colonial ecological damage, and a proposed harmonised methodology for the African Union.

|    |                                                                                    |       |
|----|------------------------------------------------------------------------------------|-------|
| 01 | List of Abbreviations                                                              | p. 01 |
| 02 | Glossary of Key Terms                                                              | p. 02 |
| 03 | Acknowledgements                                                                   | p. 03 |
| 04 | Executive Summary                                                                  | p. 04 |
| 05 | Preface                                                                            | p. 06 |
| 06 | Introduction                                                                       | p. 08 |
| 07 | Part 1 — Precedents: Reparations in International Practice                         | p. 11 |
| 08 | Methodology and Scope of This Report                                               | p. 17 |
| 09 | Part 2 — Five Country Case Studies (Nigeria, Ghana, Senegal, Uganda, South Africa) | p. 21 |
| 10 | Cross-Case Synthesis                                                               | p. 29 |
| 11 | Part 3 — Toward a Harmonised Methodology                                           | p. 31 |
| 12 | Conclusions                                                                        | p. 34 |
| 13 | Recommendations and Way Forward                                                    | p. 36 |
| 14 | Anticipated Objections                                                             | p. 39 |
| 15 | Appendix 1: Summary Tables                                                         | p. 41 |
| 16 | References                                                                         | p. 44 |

# List of Abbreviations

|                                                                            |                                                                   |
|----------------------------------------------------------------------------|-------------------------------------------------------------------|
| <b>AU</b> — African Union                                                  | <b>AMCEN</b> — African Ministerial Conference on the Environment  |
| <b>CoE</b> — Council of Europe                                             | <b>EIA</b> — Environmental Impact Assessment                      |
| <b>EU ECD</b> — European Union Environmental Crime Directive               | <b>GGW</b> — Great Green Wall (Sahel land restoration initiative) |
| <b>IACHR</b> — Inter-American Court of Human Rights                        | <b>IAIA</b> — International Association for Impact Assessment     |
| <b>ICC</b> — International Criminal Court                                  | <b>ICJ</b> — International Court of Justice                       |
| <b>IEP</b> — Independent Expert Panel (on the legal definition of ecocide) | <b>ILC</b> — International Law Commission                         |
| <b>LDN</b> — Land Degradation Neutrality                                   | <b>NPK</b> — Nitrogen, Phosphorous, Potassium (fertiliser metric) |
| <b>UNCCD</b> — United Nations Convention to Combat Desertification         | <b>UNEP</b> — United Nations Environment Programme                |

# Glossary of Key Terms

---

**Absolute environmental impact.** The total, unscaled magnitude of environmental degradation attributable to a given cause, irrespective of the size of the country or ecosystem affected. Contrasted in this report with proportional impact (see below); the distinction follows Bradshaw, Giam and Sodhi (2010).

**CO2lonialism.** A term coined in April 2000 by the Norwegian environmental organisation NorWatch to describe the leasing of African land for carbon-offset tree plantations on terms favourable to external investors and unfavourable to the local population; documented in this report's Uganda case study and adopted as this report's title.

**Ecocide.** As defined by the Independent Expert Panel (2021): "unlawful or wanton acts committed with knowledge that there is a substantial likelihood of severe and either widespread or long-term damage to the environment being caused by those acts."

**Groundnut Basin.** The central and western belt of Senegal in which colonial and post-colonial groundnut (peanut) monoculture was concentrated; the subject of this report's Senegal case study.

**Harmonised methodology.** In this report, a methodology for measuring and valuing colonial ecological damage that applies a single, agreed set of metrics and valuation methods consistently across countries, as distinct from the differing, country-specific methods used in this report's own five illustrative case studies.

**Proportional environmental impact.** Environmental degradation measured relative to a country's available ecological resources, rather than in absolute terms. See Absolute environmental impact, above.

**Unequal exchange.** In economics, the theory that international trade systematically transfers value from lower-income to higher-income economies through persistent price differentials, independent of any formal colonial relationship; quantified for the 1990-2015 period by Hickel, Dorninger, Wieland and Suwandi (2022), discussed in the Methodology section of this report.

# Executive Summary



Prof. J. G. Nkem Onyekpe  
Dept. of History & Strategic  
Studies,  
University of Lagos

Claims for colonial reparation in Africa have, to date, rested almost entirely on a ledger of direct loss: lives taken, people sold into bondage, artefacts and valuables removed, minerals extracted and shipped abroad. This report argues that the ledger is incomplete. It presents five country case studies — Nigeria, Ghana, Senegal, Uganda, and South Africa — showing a consistent colonial pattern: the forced imposition of export monoculture, unregulated mineral and timber extraction, the clearing of forest and wetland habitat, and the engineered dispossession of land, whose consequences — soil exhaustion, desertification, biodiversity loss, water insecurity, and diminished agricultural potential — did not end with independence and continue to compound today, expressed most visibly in each country's present-day vulnerability to climate change.

This indirect and long-term ecological damage has never been systematically measured or costed, in contrast to the direct losses that existing reparations claims already document. The report's five cases are offered as a demonstration, not a complete accounting: they show that the damage is real, patterned, and traceable to specific colonial policies, even before it is reduced to a monetary figure. A sixth, contemporary form of the same pattern — the leasing of African land for carbon-offset plantations that has come to be known, since the year 2000, as “CO2lonialism” — is documented in this report's Uganda case as evidence that the colonial pattern this report describes has not ended with formal independence; it has, in the specific domain of carbon markets, been reissued in modern form.

**The case for reparation for colonial ecological damage is real, is documented, and has genuine momentum — but only a harmonised, jointly agreed methodology can turn that momentum into a claim that will hold up to scrutiny.**

A second, and newly urgent, finding of this report is that the legal and institutional environment for such claims has shifted markedly since 2021. The adoption of a working legal definition of ecocide by the Independent Expert Panel, followed by binding or soon-to-be-binding instruments at the Council of Europe (2025) and the European Union (2024), a proposal before the International Criminal Court, and — most directly relevant to this report — the African Union's own decision in July 2025 to establish an ad hoc committee to examine the classification of “massive destruction of environmental ecosystems” as a crime, together create a window for advancing an African-led claim that did not exist even three years ago. This report also documents, for the first time in this Center's work, a directly on-point international legal precedent: the 1990s Certain Phosphate Lands in Nauru case before the International Court of Justice, in which a formerly colonised state successfully brought a claim against its former colonial administrator specifically for environmental devastation caused by colonial-era phosphate mining — a template, however imperfect, for what an African claim of this kind might look like in practice.

The report's central methodological finding is that this window cannot be used effectively without a harmonised approach to measuring ecological damage. The country cases in this report were compiled using visibly different methods, and this report shows, drawing on precedent from the environmental-sciences and ecological-economics literature, that such inconsistency is not a minor technical problem but the central obstacle to any credible monetary claim: rankings and estimates of environmental harm are highly sensitive to the choice of metric, and no monetary valuation is possible until metrics and methods are agreed. At the same time, this report documents that valuation exercises of comparable ambition and scale — including a peer-reviewed 2022 estimate that puts the value of resources appropriated from the global South through unequal exchange at over \$10 trillion per year in 2015 alone — have already been attempted successfully elsewhere in the economics literature, demonstrating that the scale of the exercise this report calls for is not beyond the reach of existing analytical methods.

It is worth being explicit, even at this preliminary stage, about the order of magnitude such an exercise implies. The \$10.8 trillion-per-year and \$242 trillion cumulative figures cited above cover only twenty-five years, 1990 to 2015, of ordinary international trade under formally post-colonial conditions; they do not attempt to value the far more extractive and far longer colonial period itself, which for most of the countries examined in this report ran for the better part of a century, and in some parts of Africa considerably longer. If the same order of logic — that large-

scale, structurally unequal appropriation of resources, land, energy, and labour is capable of rigorous monetary valuation — were extended backward across the full duration of colonial rule and across the full set of affected African states, rather than confined to twenty-five recent years of trade in a single global study, the resulting figure would not be of the same order as the sums discussed in this report's Precedents section for direct historical harm. It would, on any plausible extrapolation, run into the hundreds of trillions of dollars, and quite possibly beyond. This report does not attempt that calculation, this report's own five case studies, discussed at length below, would apply with even greater force to a century-scale, continent-wide extrapolation of this kind. The point of noting the plausible order of magnitude here is narrower: it is to make clear that the exercise this report recommends is not a marginal accounting correction, but a reckoning with a sum large enough that the absence of any agreed methodology for producing it should itself be treated as a matter of urgency.

The report therefore recommends: (i) that the five case studies be treated as a pilot demonstration of scope and pattern, not a final costing; (ii) that a multidisciplinary technical working group be convened to develop a harmonised methodology for quantifying colonial ecological damage, benchmarked jointly at the African Union level and timed to inform the AU's own 2027 review of ecocide classification; (iii) that the resulting valuation be added to, rather than substituted for, existing reparations claims for direct colonial harm; and (iv) that any resulting climate or ecological finance arrangement avoid the accounting failures — most notably the double-counting of existing development aid as new climate finance, documented at a rate of 93 percent among wealthy-country climate finance reported between 2011 and 2020 — that have undermined the credibility of comparable international finance commitments to date.

## Preface

---

This report was not commissioned in a vacuum. It responds to a specific and recent shift in the international legal landscape that makes the case for reparation for colonial ecological damage more urgent, and more actionable, than at any point since African independence. For most of the post-independence period, the vocabulary available for describing environmental destruction — “degradation,” “damage,” “harm” — carried no independent legal weight of its own. It was, at best, evidence in support of a broader claim grounded in human rights or property law. This began to change in 2021, when the Independent Expert Panel convened by the Stop Ecocide Foundation proposed a working legal definition of ecocide: “unlawful or wanton acts committed with knowledge that there is a substantial likelihood of severe and either widespread or long-term damage to the environment being caused by those acts.” The proposal was not, in itself, binding on anyone. What has followed since has been.

In May 2024, the European Union’s Environmental Crime Directive entered into force, obliging member states to criminalise conduct causing widespread and substantial ecosystem damage, and introducing twenty new categories of environmental offence across the Union. In May 2025, the Council of Europe adopted its own Convention on the Protection of the Environment through Criminal Law, described by its own drafters as the first internationally binding instrument to address conduct “that many term ‘ecocide.’” Thirteen countries — including Ukraine, Georgia, Armenia, Vietnam, and Belgium — now have ecocide provisions of some form in national law, and several more, including Argentina, Brazil, Italy, and the Dominican Republic, have bills before their legislatures. In December 2024, the United Nations High Commissioner for Human Rights called on States Parties to the International Criminal Court to adopt ecocide as an independent crime under the Rome Statute.

Most directly relevant to this report, in July 2025 African environment ministers — meeting jointly under the UN Environment Programme, the African Union, and the African Ministerial Conference on the Environment — formally listed ecocide among the continent’s top environmental priorities for 2025–2027, and established an ad hoc committee, at the initiative of the Democratic Republic of the Congo, to examine the classification of “massive destruction of environmental ecosystems” as a crime. The Republic of Congo and Burundi have since joined the DRC in calling for continent-wide criminalisation. The committee is due to report in 2027.

These are not developments this Center anticipated when its work on colonial ecological damage began; they are events of the past four years, several of them of the past twelve months. They mean that a body of evidence long treated as background or context to reparations claims — the ecological record of colonial rule — now has a plausible legal home to occupy in its own right, at the very moment the African Union is preparing to consider exactly this question.

Two further developments, uncovered in the course of preparing this expanded report, sharpen the case still further. First, this report’s authors located a genuine precedent, not previously discussed in this Center’s work, for exactly the kind of claim this report envisages: in the early 1990s the Republic of Nauru brought a case before the International Court of Justice against Australia — its former colonial administrator, jointly with the United Kingdom and New Zealand — specifically over the environmental devastation wrought by decades of unrestored colonial-era phosphate mining. The case, discussed in the Precedents section below, is not a template to be copied uncritically, but it establishes beyond doubt that a formerly colonised state suing a former colonial power specifically over environmental — not merely economic or human-rights — harm is not a hypothetical construction; it has already happened, and it produced a negotiated settlement.

Second, this report’s research uncovered that the term this report’s title borrows — “CO2lonialism” — is not a rhetorical flourish invented for this occasion. It was coined in substantially this form in April 2000 by the Norwegian environmental watchdog NorWatch, in a report documenting the eviction of thousands of Ugandans from their land to make way for Norwegian-owned carbon-offset tree plantations. The term has since recurred independently at UN climate negotiations, including at COP27 in 2022, in the mouths of Indigenous delegates describing an almost identical pattern in the Amazon. That a term describing colonial-style land appropriation for carbon markets was coined specifically about Uganda — one of this report’s five case-study countries — and that the pattern it describes continues into the present day, is addressed directly in the Uganda case study below.

This report is offered as a contribution to the process now underway at the African Union: not as a finished legal instrument, but as a demonstration, grounded in five national case studies and in the wider precedent and legal literature now available, of the scale of the damage at stake and of the methodological work still required before it can be quantified and claimed.



# Introduction

---

The development of industries and plants in Europe in the aftermath of the Industrial Revolution, 1750-1830, was epochal in the economic history of the world. Significantly, it was associated with unprecedented expansion, sophistication, and transformation in production of goods and services. What started in England and gradually extended to the rest of Britain rapidly spread to all of Europe and elsewhere, making industrialization a global phenomenon. However, because the process was driven not by the state or the public but by private capital and its interests, there was no central planning in any of the rapidly industrializing countries. This created a crisis, what Marxist scholars and theorists would term “anarchy of production” euphemised by bourgeois economists as business cycles. For example, while industrial production rapidly expanded, there was no corresponding expansion in raw material production. Besides, there was declining demand for the products of industries and plants as there was generally low income for the working class and the mass of the people for who the goods and commodities were produced. These problems combined to produce a third problem, declining rate of profit. These domestic problems could not be resolved domestically as there was no planning beyond planning for the rise and rise of profit for private capital. Individual investors simply planned their production with profit maximisation in mind. The solution to the economic problem was sought outside in virgin lands not industrialised, for raw materials, for market, and for industrial goods and commodities, and for opportunity for the investment of “surplus” finance capital lying idle in the banks. This was what led to the penetration of Africa and other regions of the southern hemisphere or the global south for economic and commercial opportunities.

The competition among the leading European countries — Britain, France, Germany, Portugal, Belgium — and the convening of a conference in Berlin, Germany in February 1884 finally led to the division or partition of Africa by the European powers. In the immediate aftermath of the Berlin Conference, February 1884-November 1885, at which Africa was divided among the European powers, African states, kingdoms, and peoples were invaded, conquered, and colonised.

If the primary motive for the partition, invasion, and conquest of Africa was to resolve the domestic problems of Europe, which at the time had no domestic solution, it was only logical that the economic and social policies of the colonising European powers would be formulated to address their problems. Consequently, in the formulation of their individual overseas ‘development’ policies and programmes in their colonial offices at home, and in the execution of the policies and programmes in the colonies, the interests of the colonising powers were cardinal and overriding vis-à-vis those of the colonies. By right of conquest, the conquered territories, the new colonies, had become overseas extensions or provinces of the European powers. This meant that whatever was found in the colonies in terms of land and natural resources, and whatever was generated from them, automatically belonged to the mother colonies, so called.

## The Economic-History Debate, and Why This Report Sidesteps It

The economic history of colonialism is by now a substantial field in its own right, and it is not univocal on the question of legacy. Economic historians working on the long-run effects of colonial institutions have shown that colonialism produced markedly different, and unevenly distributed, outcomes across the continent: in some regions, colonial cash-crop extraction left behind infrastructure — roads, urban centres — that correlates with higher measured development today, even as it depressed investment in the surrounding hinterland and entrenched a lasting pattern of spatial inequality [41]. Others, examining Africa’s colonial experience as a whole, argue that whatever local infrastructural residue colonialism produced, the continent is, by any plausible counterfactual, poorer today for having been colonised than it would otherwise have been [42]. A related and still more contested literature asks whether colonial legacies remain the dominant explanation for Africa’s present institutional and economic outcomes at all, or whether their measurable influence has faded over the post-independence decades as domestic institutions have diverged from their colonial starting points [51 — see References]. Kaniyathu’s methodological critique of this literature is instructive here: because colonialism cannot be randomly assigned, any claim about its economic “impact” is inescapably a claim about a counterfactual — what would have happened to a given territory absent colonisation — and different, defensible choices of counterfactual can produce sharply different verdicts on the same historical record [61].

This report does not attempt to adjudicate that broader economic debate, and for a specific reason: the counterfactual problem that makes the economic-history debate so intractable is far less severe for the kind of claim this report is concerned with. It is one thing to ask what Nigeria’s GDP would be today had it never been colonised

— a question that requires modelling an entire alternative economic trajectory across more than a century. It is a narrower and more tractable question to ask what a specific forest, watershed, or soil system would look like today had a specific, documented colonial policy — the compulsory cultivation order, the mining concession, the land act — never been imposed on it. Ecological systems, unlike national economies, often leave a physical record of their prior state — soil profiles, sediment cores, historical forest-cover surveys, colonial administrative records of land condition before and after a given concession — that can anchor a counterfactual far more directly than any general claim about an alternative economic history. This report's position is therefore narrower and, we argue, less contested than the wider colonialism-and-development debate: whichever view one takes of colonialism's net effect on income and institutions, its effect on the physical environment — forests cleared, soils exhausted, watersheds altered, biodiversity destroyed — is a separate and cumulative form of damage, distinct from and additional to its economic and institutional legacy, and one that existing reparations frameworks have not yet attempted to measure.

Nor is the scale of quantification this report ultimately calls for without precedent in the wider economics literature. A 2022 study published in *Global Environmental Change* used environmental input-output and footprint analysis to estimate the value of resources — raw materials, land, energy, and labour — appropriated from the global South by the global North through unequal exchange in international trade, and found that this appropriation was worth over \$10.8 trillion per year in 2015 alone, measured in Northern prices, and totalled some \$242 trillion over the period 1990–2015 — a sum equivalent to roughly a quarter of the North's cumulative GDP over the same period [68]. Whatever one makes of the specific assumptions behind that estimate, it demonstrates that placing a rigorous, defensible monetary figure on large-scale, structurally unequal resource transfers between colonising and colonised economies is a going concern in contemporary economics, not a speculative or unprecedented undertaking.

## **Purpose, Scope, and Structure of this Report**

The purpose of this report is fourfold: first, to document, through five national case studies, the ecological consequences of colonial economic policy in a form detailed enough to support a future monetary claim; second, to show why no such claim can currently be made in a comparable way across countries, given the absence of a shared methodology; third, to set out what is required — technically and institutionally — to build that methodology, and to place this recommendation in the specific window of opportunity created by the African Union's own 2025–2027 review of ecocide classification; and fourth, to show, through precedent in international law and in the economics literature, that both the legal and the technical foundations for such a claim already exist in adjacent domains, even though they have not yet been assembled for this specific purpose.

The report examines five sub-Saharan African countries chosen as case studies for their regional and colonial-administrative diversity: Nigeria and Ghana in West Africa under British colonial rule, Senegal in West Africa under French colonial rule, Uganda in East Africa under British rule, and South Africa, whose colonial and apartheid-era environmental legacy is treated as a single continuous case. The selection is illustrative rather than exhaustive: it is intended to demonstrate that the pattern of ecological damage described in this report is not peculiar to one colonial power, one region, or one type of extractive economy, but recurs across British and French administrations, across West and East and Southern Africa, and across agricultural, mineral, and forestry extraction alike — and, in the case of Uganda, that the pattern recurs into the present day in the specific form of carbon markets.

The report proceeds as follows. Following this Introduction, the report sets out relevant precedents in international reparations practice, the recent evolution of international law on ecocide, and a directly on-point international legal precedent from Nauru. It then sets out the methodology and scope of the report, including the approach taken in each case study and its limitations, and surveys precedent for large-scale quantification of colonial and neo-colonial resource transfers. Five case studies follow: Nigeria, Ghana, Senegal, Uganda, and South Africa. The report then turns to the comparability problem raised by the differing methods used across the five cases, and to the case for a harmonised methodology agreed jointly at the African Union level. The report closes with conclusions, recommendations, and a way forward.

# 1

## PART ONE

# Precedents: Reparations in International Practice

---

---

How direct-harm reparations have been settled before, and how the emergence of ecocide as a legal category changes the calculus for ecological claims.

# Precedents: Reparations in International Practice

## Precedents for Direct Harm

Reparation is compensation for people who have suffered injustices such as exploitation, deprivation, and dispossession. As an act of making amends for past wrong or injury, reparation includes financial payouts, non-monetary restitution such as the return of expropriated land or stolen artefacts, and institutional reform. Precedent for such claims, once properly documented and quantified, is well established in modern international practice:

During the Second World War, Japanese Americans were incarcerated in internment camps. The United States responded to pressure for reparation by passing the Civil Liberties Act of 1988, which issued formal apologies and paid \$20,000 to each surviving internee.

In 1946, the US government established the Indian Claims Commission, which eventually awarded over \$1.3 billion to Native American tribes for stolen ancestral lands.

In 1952, the Luxembourg Agreement committed West Germany to pay \$20 million in goods, services, and individual pensions as partial compensation for the persecution and murder of Jewish people during the Holocaust, an agreement reached with the Conference on Jewish Material Claims against Germany.

In 2008, Canada created the Truth and Reconciliation Commission framework under the Indian Residential Schools Settlement Agreement, combining a compensation framework for Indigenous survivors of forced assimilation with a mechanism to address its social and psychological consequences.

In 2013, the British government reached an out-of-court settlement to compensate over 5,000 Kenyans subjected to torture and abuse during the Mau Mau rebellion of the 1950s against British colonial rule.

With the partial exception of the Mau Mau settlement, none of these precedents concerns colonial-era environmental destruction. Each concerns direct, identifiable, personal harm: incarceration, dispossession of a specific parcel of land, persecution, physical torture. This is the vocabulary in which international reparations claims have so far been made, and it is a vocabulary in which ecological damage — diffuse, intergenerational, and borne by an ecosystem or a region rather than by a single identifiable victim — does not naturally fit. This report's central argument is that this is a gap in the existing vocabulary of reparations, not evidence that ecological harm falls outside its proper scope.

### BOX 1

#### What Reparations Have Cost Historically

United States, Civil Liberties Act of 1988: **\$20,000** paid to each surviving Japanese American internee

United States, Indian Claims Commission (established 1946): over **\$1.3 billion** awarded for stolen ancestral lands

Luxembourg Agreement, 1952: **\$20 million** in goods, services, and pensions paid by West Germany

Kenya, Mau Mau settlement, 2013: compensation paid to over **5,000** claimants

These figures illustrate the scale and precedent of settled claims for direct colonial harm. No comparable figure exists anywhere for colonial-era ecological damage — the gap this report addresses.

## A Direct Precedent: Certain Phosphate Lands in Nauru (Nauru v. Australia)

Precedent for a reparations claim built specifically, and exclusively, around environmental destruction wrought under

colonial administration does exist, although it has not previously been part of this Center's analysis. Nauru, a small Pacific island, was administered as a colonial trust territory — first by Germany, then, following the First World War, jointly by Australia, the United Kingdom, and New Zealand — through the middle decades of the twentieth century. During this period, the administering powers oversaw intensive phosphate mining that stripped roughly four-fifths of the island's habitable surface down to bare coral pinnacle, rendering the mined land permanently unusable for agriculture or habitation, and did so without establishing any programme to rehabilitate the land once mining was complete.

Following independence in 1968, Nauru pursued the question of rehabilitation for the mined-out land through diplomatic channels for over two decades without resolution. In 1989, Nauru instituted proceedings against Australia before the International Court of Justice in *Certain Phosphate Lands in Nauru (Nauru v. Australia)*, seeking a declaration that Australia — as the power that had, in practice, administered the mining operations — bore legal responsibility for rehabilitating the phosphate lands it had mined out under the trusteeship. Australia raised a series of preliminary objections, including that any claim was time-barred and that New Zealand and the United Kingdom, as co-trustees, were indispensable parties whose absence should bar the case; the Court rejected these objections in a 1992 judgment on preliminary questions, allowing the case to proceed to its merits. Before a decision on the merits was reached, the parties settled: in 1993, Australia agreed to pay Nauru compensation, structured as a lump sum plus long-term annual payments, explicitly tied to the rehabilitation of the mined phosphate lands.

The Nauru case is not offered here as a template to be adopted uncritically; Nauru's circumstances — a single small island, a single dominant extractive industry, a single identifiable administering power — are considerably simpler than the diffuse, multi-sectoral, multi-country pattern of damage this report documents across Nigeria, Ghana, Senegal, Uganda, and South Africa. But it establishes, as a matter of settled international practice rather than aspiration, three propositions directly relevant to this report's argument: first, that a former colony can bring a claim against a former colonial administrator specifically and exclusively for environmental — not merely economic, political, or human-rights — harm; second, that such a claim can survive preliminary jurisdictional objections of the kind a defending state is likely to raise; and third, that such a claim can be resolved through a negotiated compensation package tied explicitly to environmental rehabilitation, without requiring years of full merits litigation. Each of these propositions strengthens the practical, as opposed to purely theoretical, case for the kind of continent-scale claim this report ultimately recommends be pursued through a harmonised African Union process rather than case-by-case litigation.

## The Emergence of Ecocide as a Distinct Legal Category

Until the ecocide movement gathered pace after 2021, the Nauru precedent stood largely alone; there was no broader legal category into which a claim of this kind could be placed short of a full contentious case. This has begun to change since 2021, when the Independent Expert Panel, convened by the Stop Ecocide Foundation and comprising a number of leading international law scholars and practitioners, proposed the following definition of ecocide: “unlawful or wanton acts committed with knowledge that there is a substantial likelihood of severe and either widespread or long-term damage to the environment being caused by those acts” [44]. The Panel proposed the definition be added to the Rome Statute of the International Criminal Court as a new Article 8 ter, alongside explanatory definitions of “wanton,” “severe,” “widespread,” and “long-term” damage, deliberately calibrated to distinguish ordinary lawful economic activity from conduct meriting criminal sanction [44].

The proposal has since been taken up, in modified form, by several international bodies:

The **European Union's Environmental Crime Directive**, adopted in April 2024 and in force since May 2024, criminalises “the destruction of, or widespread and substantial damage which is either irreversible or long-lasting to, an ecosystem of considerable size or environmental value,” obliging its 27 member states to introduce a qualified ecocide offence into national law by May 2026 [46].

The **Council of Europe's Convention on the Protection of the Environment through Criminal Law**, adopted in May 2025, introduces a “particularly serious offence” using language its own drafters describe as encompassing conduct “that many term ‘ecocide’”; it is open for signature and will enter into force once ten states ratify it [45].

At the **International Criminal Court**, the UN High Commissioner for Human Rights called in December 2024 for States Parties to adopt ecocide as an independent crime under the Rome Statute, a position echoed by the Republic of Vanuatu's own 2024 proposal to the same effect [50, 43].

As of 2025, thirteen countries — including Ukraine, Georgia, Armenia, Belarus, Kazakhstan, Kyrgyzstan, Moldova, the Russian Federation, Tajikistan, Vietnam, Azerbaijan, France, and Belgium — have some form of ecocide provision already in force in national law, and a further wave of bills is before the legislatures of Argentina, Brazil, Italy, the Dominican Republic, French Polynesia, Peru, Türkiye, and Scotland, among others [43].

## BOX 2

### Ecocide: A Legal Timeline In Numbers

**1989–1993** — Nauru brings, and settles, the first international case built specifically around colonial-era environmental rehabilitation (*Nauru v. Australia*, ICJ)

**2021** — Independent Expert Panel proposes a legal definition of ecocide

**2021** — **11** countries have already criminalised ecocide in some form; a further **27** are considering doing so

**2024, May** — EU Environmental Crime Directive enters into force (**20** new environmental offences; member states must transpose by **May 2026**)

**2025, May** — Council of Europe Convention on the Protection of the Environment through Criminal Law adopted; enters into force after **10** ratifications

**2025, July** — African Union / AMCEN lists ecocide among Africa's top priorities for **2025–2027**; ad hoc committee established

**2025** — **13** countries now have ecocide provisions in force

**2027** — AU ad hoc committee expected to report

National penalties for ecocide now on the books range from 10–15 years' imprisonment (Armenia, Azerbaijan) to 20 years and fines of up to €1.6 million for corporations (Belgium).

## Directly Relevant to This Report: The African Union's Own Process

Most relevant to the present report, in July 2025 the Twentieth Session of the African Ministerial Conference on the Environment — organised jointly by the UN Environment Programme, the African Union, and the Conference itself — formally agreed to list ecocide among the continent's top environmental priorities for 2025–2027 [47]. The decision establishes an ad hoc committee to “examine the classification of the massive destruction of environmental ecosystems,” building on a proposal by the Democratic Republic of the Congo, itself joined at the July 2025 summit by national statements from the Republic of the Congo and the Republic of Burundi encouraging the criminalisation of ecocide throughout the African Union [47]. African states are expected to consider the ad hoc committee's report, and likely revisit the formal introduction of ecocide as a crime, in 2027.

This creates a specific and time-limited opportunity. A harmonised methodology for quantifying colonial ecological damage — of the kind this report calls for below — would arrive at precisely the moment the African Union is already engaged in defining what counts as environmental destruction serious enough to warrant a legal remedy. The case studies that follow, and the methodological argument that follows them, are offered as a contribution to that same process, from its historical rather than its prospective end: not what conduct should be criminalised going forward, but what damage has already been done, and how it might be measured.

It is worth noting, for balance, that legal scholars remain divided on whether the International Criminal Court is in practice a workable venue for ecocide prosecution at all, citing the Court's exclusion of corporations from its jurisdiction, an intent standard that may be poorly suited to environmental harm, and evidentiary thresholds that could in practice exclude most environmental cases from consideration [48]. Domestic prosecution and treaty-based mechanisms — of the kind now emerging at the EU, Council of Europe, and prospectively African Union level — may in practice prove more consequential than an amendment to the Rome Statute [49]. The Nauru precedent discussed above points in a similar direction: it was resolved not through a specialised environmental-crimes tribunal, which did not exist at the time, but through the ordinary machinery of state-to-state dispute resolution at the International Court of Justice, followed by direct negotiation. This suggests that the African Union process, and any claims that ultimately flow from it, need not wait for the resolution of the still-unsettled debate over the International Criminal Court's role; a state-to-state or AU-coordinated claim, grounded in a harmonised evidentiary record of the kind this report calls for, could in principle proceed on its own institutional track, as Nauru's did.

## International Courts and the Broader Legal Environment

Beyond the ecocide-specific instruments discussed above, several existing bodies of international law already provide partial, if imperfect, footholds for a claim of the kind this report envisages, and are worth surveying briefly because a future AU-coordinated claim would likely need to draw on several of them simultaneously rather than relying on any single instrument.

The Rome Statute of the International Criminal Court already criminalises a narrow category of environmental harm, at Article 8(2)(b)(iv), which prohibits “internationally launching an attack in the knowledge that such attack will cause incidental loss of life or injury to civilians or damage to civilian objects or widespread, long-term and severe damage to the natural environment which would be clearly excessive in relation to the concrete and direct overall military advantage anticipated.” This provision is narrowly drawn — it applies only to international armed conflicts, excludes corporate actors entirely, and requires proof of a demanding proportionality standard — but it establishes that the Rome Statute’s drafters already accepted, as early as 1998, that severe environmental destruction could in principle constitute an international crime in its own right, a foothold the Independent Expert Panel’s proposed Article 8 ter would substantially broaden.

A related and older instrument, the 1978 Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD), ratified or acceded to by 78 states, forbids the hostile use of environmental modification techniques that have “widespread, long-lasting or severe effects” as a means of causing damage to another state. ENMOD is narrower still than Article 8(2)(b)(iv) — it addresses deliberate weaponisation of the environment, not resource extraction — but it is nonetheless the oldest binding international instrument to treat large-scale environmental harm as a matter meriting a dedicated treaty regime, and its 1976 UN General Assembly adoption demonstrates that the international community has, for nearly half a century, accepted the principle that environmental harm of sufficient scale is a legitimate subject of binding international regulation between states.

More directly relevant to the kind of claim this report envisages is the Inter-American Court of Human Rights’ developing jurisprudence on the right to a healthy environment. In its 2020 opinion in *Comunidades Indígenas Miembros de la Asociación Lhaka Honhat (Nuestra Tierra) v. Argentina*, the Court held that the right to a healthy environment “protects the components of the environment, such as forests, seas, rivers, and other[s] as legal interests in themselves, even in the absence of certainty or evidence of a risk to individuals,” reasoning that “nature must be protected, not only because of its benefits or effects for humanity, but because of its importance for the other living organisms with which we share the planet.” This is a materially significant doctrinal move: it establishes, at least within the Inter-American system, that environmental harm can found a legal claim independent of any showing of harm to a specific identifiable human victim — precisely the evidentiary difficulty this report identified earlier as the central obstacle to fitting ecological damage into the existing, person-centred vocabulary of reparations claims. In July 2025, the same Court went further still, in an Advisory Opinion on the Climate Emergency and Human Rights requested by Chile and Colombia, holding that Member States must adopt specific, science-based measures to reduce greenhouse gas emissions, including regulation of corporate emissions and corporate “greenwashing.” No equivalent regional human rights court yet exists with jurisdiction over Africa in the same institutional configuration, but the African Union’s own AMCEN process, discussed above, could in principle develop an analogous doctrine specific to the African context, grounded in the African Charter on Human and Peoples’ Rights’ own guarantee of a “general satisfactory environment favourable to development.”

Finally, the International Court of Justice’s own jurisprudence has moved steadily in a direction favourable to claims of this kind. In its 1996 advisory opinion on the *Legality of the Threat or Use of Nuclear Weapons*, the Court held that states have a general duty to prevent significant harm to the environment, requiring states to act with due diligence. In a much more recent 2025 advisory opinion on climate change, requested by the UN General Assembly, the Court found that this due-diligence standard is “particularly apposite” and indeed “stringent” in the specific context of climate-related harm, given what the Court called the “indisputably established” risk of significant harm to the climate system; the Court further found that international law recognises a “human right to a clean, healthy and sustainable environment” as a prerequisite to the enjoyment of other human rights, and — most significantly for this report’s purposes — that states have a duty to provide full reparation for environmental damage caused by internationally wrongful acts. A separate declaration by Judge Cleveland in the same case extended this reasoning explicitly to environmental harm “resulting from armed conflicts and other military activities,” a category with an obvious, if not yet tested, analogy to the extractive military and administrative conduct of colonial occupation documented throughout this report’s five case studies. None of this 2025 jurisprudence was framed with colonial-era conduct in mind, and its application to historical rather than ongoing harm remains untested; but it demonstrates that the general legal architecture within which a colonial ecological damage claim would need to be argued — due diligence, a right to a healthy environment, a duty of reparation for environmental harm — has, over just the past three years, moved decisively toward recognising exactly the kind of obligations such a claim would invoke.

## **National Ecocide Legislation: Illustrative Detail**

The bare figures in Box 2 above — thirteen countries with ecocide provisions in force, a further wave of bills pending — understate how substantive some of this national legislation already is, and how directly it anticipates the kind of retrospective, historically-grounded environmental accounting this report calls for. A brief survey of the more developed examples illustrates the range of legal models now available for the African Union process to draw on.



Georgia's criminal code, at Article 409, defines ecocide as "contamination of the atmosphere, soil, water resources, mass destruction of fauna or flora, or any other act that could have led to an ecological disaster," carrying a penalty of twelve to twenty years' imprisonment, rising to fourteen years to life imprisonment where the same conduct occurs in the context of armed conflict — a distinction the drafters clearly judged worth preserving, and one with an obvious analogue in the distinction this report draws between ordinary and armed-conflict-era colonial extraction, discussed further in the Nigeria case study's account of the Niger Delta. Ukraine's Article 441 defines ecocide in near-identical terms — "mass destruction of flora and fauna, poisoning of air or water resources, and also any other actions that may cause an environmental disaster" — and Ukraine is, at the time of writing, actively pursuing ecocide charges domestically against Russia in relation to the destruction of the Nova Kakhovka Dam, providing a live, contemporary example of exactly the kind of state-level ecocide prosecution the AU process might eventually enable in an African context, albeit directed at internal rather than external colonial-era conduct.

Belgium's 2024 revision of its penal code is of particular interest because it was drafted specifically to align domestic law with the European Union's Environmental Crime Directive, making it, in effect, a worked example of how a supranational framework instrument gets translated into enforceable national law — precisely the translation exercise a future AU instrument would eventually require of its own member states. Belgium's Article 94 defines ecocide as "deliberately committing, by action or omission, an illegal act causing serious, widespread and long-term damage to the environment, knowing that such act causes such damage," with penalties of fifteen to twenty years' imprisonment for individuals and fines of up to €1.6 million for corporations — and, notably, applies extraterritorially, reaching conduct that cannot be geographically located within Belgium at all, provided it violates federal legislation or a binding international instrument. An extraterritorial reach of this kind is directly relevant to any future claim concerning colonial-era conduct: the environmental damage documented in this report's five case studies was, in every instance, caused by conduct undertaken by an external colonial power, not by the affected country's own domestic actors, and a legal framework that could not reach conduct occurring (or, in the colonial case, originating in decisions made) outside its own borders would be of limited use for exactly the kind of claim this report envisages.

France, for its part, was the first EU member state to legislate on ecocide, doing so in 2021, several years ahead of the EU Directive that would eventually require it of all member states; French law confines ecocide to the most serious cases, requires proof of intent, and — in a provision with a direct bearing on this report's institutional recommendations — obliges the French government to report annually to Parliament on its own efforts to promote the international recognition of ecocide in international criminal law, giving that country's legislature a standing, statutory mechanism for tracking exactly the kind of international legal development this report's Precedents section has traced. No comparable statutory reporting obligation yet exists at the African Union level; this report's Recommendations section proposes that the AU's own ad hoc ecocide committee, once it reports in 2027, be given an equivalent standing mandate.



# Methodology and Scope of This Report

## Case Selection

The five countries examined in this report — Nigeria, Ghana, Senegal, Uganda, and South Africa — were selected to illustrate the recurrence of a common colonial ecological pattern across different colonial administrations (British and French), regions (West, East, and Southern Africa), and modes of extraction (agricultural monoculture, mineral extraction, commercial forestry, and land expropriation). They are not a random or statistically representative sample, and the report does not claim that its findings generalise, without further work, to the roughly fifty other African states that experienced colonial rule.

## Approach Taken in Each Case Study

Each case study in this report was compiled by identifying, from the available literature, evidence of five recurring categories of ecological damage: (i) forced or incentivised conversion to export monoculture and its long-run effect on soil fertility; (ii) unregulated extraction of solid minerals and its effect on land, water, and downstream ecosystems; (iii) commercial forestry and deforestation; (iv) disruption of customary land tenure and conservation regimes; and (v) the resulting present-day vulnerability to climate hazards, where documented. Each case draws on the secondary literature available to this Center, supplemented in the case of Senegal, Ghana, South Africa, and Uganda by recent peer-reviewed and policy literature on colonial climate vulnerability and, in the case of Uganda, by investigative reporting on contemporary carbon-market land transactions.

The reader will note, on comparing the five case studies, that they are not written to a single, shared template of evidence: some rely on continuous historical narrative supported by a small number of primary sources; others draw more heavily on recent quantitative and policy literature with explicit citations. This is not an editorial inconsistency to be smoothed over for presentation; it is itself the report's central methodological finding, developed at length in the section "Toward a Harmonised Methodology" below. A comparable, defensible monetary claim cannot be built by aggregating five case studies compiled by five different methods, however individually sound each may be. The case studies that follow should therefore be read as five independent demonstrations that ecological damage of the kind this report describes exists, is documented, and follows a recognisable colonial pattern — not as five directly comparable, additive estimates of loss.

## A Precedent for Harmonised Cross-Country Environmental Measurement

That a harmonised, cross-country methodology for measuring environmental impact is achievable — and that it is far from trivial to build — is demonstrated by the closest existing precedent this report has identified: Bradshaw, Giam, and Sodhi's 2010 study *Evaluating the Relative Environmental Impact of Countries*, published in PLoS ONE [41]. That study ranked 228 countries on two distinct composite indices: a **proportional** index of environmental impact relative to each country's available resources, and an **absolute** index of total environmental degradation, each built from seven internationally comparable metrics — natural forest loss, natural habitat conversion, marine captures, fertiliser use, water pollution, carbon emissions, and the proportion of species threatened with extinction — deliberately excluding indicators of human health or economic performance, which the authors judged would dilute or confound the specifically environmental signal [41].

Three features of that methodology are directly relevant to the harmonised framework this report calls for:

**The distinction between proportional and absolute impact.** A country's environmental impact "relative to its own resources and opportunity" and its "total contribution to global or regional ecological degradation" are different quantities, answer different questions, and in Bradshaw et al.'s data were in fact negatively correlated across countries [41]. A future methodology for colonial ecological damage will need to make an equivalent choice explicit: is the claim being built around damage relative to the scale of each country's ecosystem, or around the total, absolute magnitude of degradation, irrespective of country size? The two are not interchangeable, and conflating them — as an aggregation of five differently-scoped national case studies risks doing — would produce a comparison that is not actually commensurable.

**Sensitivity of rankings to the choice of metric.** Bradshaw et al. tested how robust their composite rankings were to the inclusion or exclusion of any single component metric, and found correlations (Kendall's  $\tau$ ) with the full index

ranging from as low as 0.70–0.81 in some cases to as high as 0.93 in others, depending on which of the seven metrics was removed [41]. In other words, even a carefully constructed composite index, built from just seven metrics all measured on a comparable global basis, produces materially different country rankings depending on which specific indicators are included. This is the technical form of the “comparability problem” set out below: a claim built by informally aggregating heterogeneous national case studies, using different underlying indicators in each, will be considerably less robust than even a formally constructed composite index — and cannot support a defensible monetary figure until the underlying metrics are agreed.

**A transparent, replicable, and metric-based construction.** Bradshaw et al.’s indices were built from data already collected and published by international bodies (the FAO, the IUCN, the World Bank, and others) using an explicit and published formula, rather than by qualitative narrative judgement. This is the form a harmonised colonial ecological damage methodology should ultimately take: not a set of narrative case studies of varying rigor, however individually well documented, but a small number of explicit, historically-extended metrics — analogous to forest loss, habitat conversion, and soil degradation — that can be consistently applied across every affected country and audited by an independent technical body.

### BOX 3

#### Precedent For A Cross-Country Environmental Index

Bradshaw, Giam and Sodhi (2010), Evaluating the Relative Environmental Impact of Countries:

**228** countries considered; **179** (proportional index) and **171** (absolute index) had sufficient data

**7** harmonised metrics combined into each composite index

Ranking sensitivity to dropping a single metric: Kendall’s  $\tau$  ranged from **0.70–0.81** (proportional index) to **0.92** (absolute index)

Correlation between the proportional and absolute indices:  $\tau = -0.28$  (negative) — confirming they measure genuinely different things

**49** countries, mostly small islands, excluded from the proportional ranking for lack of data

Even a carefully harmonised index of just 7 metrics shows this much sensitivity to method. An informal aggregation of five differently-compiled case studies, as in the present report, would be considerably less robust still.

## A Precedent for Retrospective, Archive-Based Reconstruction of Colonial Environmental Change

A second and more recent precedent, and one directly analogous to the historical reconstruction this report’s own case studies attempt on a smaller scale, is a 2025 study published in *Communications Earth & Environment* that mapped changes in montane forest extent in Kenya from 1910 to 2024, combining historical maps, colonial-era archival administrative documents, satellite imagery, and settlement datasets [60 — see References]. That study found that primary montane forest within colonial settlement areas — connected by the railway network built from 1895 onward and by graded roads serving colonial sawmills and export stations — was cleared far more extensively, and far earlier, than forest within native settlement areas, which had by contrast been left comparatively unconnected to the same transport infrastructure and were correspondingly less accessible to large-scale timber extraction. This is exactly the kind of retrospective, evidence-based, GIS-anchored methodology that a harmonised African Union framework should aim to apply systematically: it demonstrates that colonial-era environmental change can be reconstructed rigorously, using a combination of archival and remote-sensing sources, at a resolution fine enough to distinguish the specific effect of colonial infrastructure and administrative boundaries from other, non-colonial drivers of land-cover change — precisely the kind of attribution a future reparations methodology would need to establish.

## A Precedent for Large-Scale Quantification of Colonial and Neo-Colonial Resource Transfers

A further, and more directly economic, precedent for the scale of quantification this report ultimately calls for is provided by Hickel, Dorninger, Wieland, and Suwandi’s 2022 study in *Global Environmental Change*, which used environmental input-output and footprint analysis to estimate the physical scale and monetary value of resources — raw materials, land, energy, and labour — appropriated from the global South by the global North through unequal

exchange in international trade between 1990 and 2015 [68]. The study found that in 2015 alone, the North net-appropriated some 12 billion tonnes of raw material equivalents, 822 million hectares of embodied land, 21 exajoules of embodied energy, and 188 million person-years of embodied labour from the South, worth \$10.8 trillion in Northern prices — a sum the authors note would be sufficient to end extreme poverty seventy times over — and that the cumulative drain over the full 1990–2015 period totalled some \$242 trillion in constant 2010 dollars, equivalent to roughly a quarter of the North’s own GDP over the same period [68]. Whatever position one takes on the specific assumptions and price benchmarks used in that study — and the authors themselves report a wide range depending on whether appropriation is valued in Northern or global-average prices — its methodological significance for this report is straightforward: it demonstrates that rigorous, peer-reviewed, input-output-based quantification of large-scale, structurally unequal resource transfers between the global North and South is an established and technically feasible undertaking in contemporary economics, not a speculative exercise unique to this report’s subject matter. A harmonised methodology for colonial ecological damage, of the kind this report recommends below, would in effect need to combine the physical, historically-anchored measurement approach of Bradshaw et al. and the Kenya forest-mapping study with the economic valuation approach of Hickel et al. — translating a physical record of environmental loss into a defensible monetary figure using established trade and resource-accounting methods, rather than inventing an entirely new valuation framework from first principles.

## **A Complementary Precedent: Best-Practice Standards for Impact Assessment**

A further complementary precedent is the International Association for Impact Assessment’s Principles of Environmental Impact Assessment Best Practice, developed jointly with the UK’s Institute of Environmental Assessment [42]. While designed for prospective assessment of proposed development projects rather than retrospective assessment of historical damage, its Basic Principles — that an assessment process should be purposive, rigorous, credible, systematic, transparent, and interdisciplinary, and that it should be carried out “with professionalism, rigor, fairness, objectivity, impartiality and balance, and be subject to independent checks and verification” [42] — describe exactly the standard a future African Union-level methodology for colonial ecological damage would need to meet in order to be taken seriously by governments, courts, and international financial institutions alike. This report recommends, in the section on recommendations below, that these Principles be used as a starting reference standard for the technical working group it proposes, adapted from prospective project assessment to retrospective historical assessment.

## **Data Sources and Their Limitations, by Case**

For transparency, and to give the technical working group recommended below a concrete starting inventory of where methodological harmonisation is most urgently needed, this report records the following observations on the data underlying each case study. The Nigeria case draws primarily on historical narrative and a small number of directly quoted primary sources (notably a colonial-era land rehabilitation report), supplemented for the Niger Delta by post-independence quantitative reporting on oil spill volumes; because no single, continuous, officially reconciled time series of Niger Delta oil spill volumes exists, this report’s own chart for Nigeria is a reconstruction from several partial and mutually inconsistent estimates, a limitation disclosed in the chart’s caption. The Ghana case draws on a mixture of historical narrative and recent peer-reviewed literature on cocoa-driven deforestation; the underlying forest-cover figures it cites are drawn from multiple independent surveys conducted in different years using different methods, producing the nearly twofold spread in current-day forest-area estimates noted earlier in this section. The Senegal case draws on a combination of historical-economic scholarship (particularly comparative work on colonial cash-crop economies) and grey-literature reporting on soil degradation and restoration programmes in the Groundnut Basin; the export-share and land-area figures it cites should be treated as order-of-magnitude indicators pending verification against primary FAO or Senegalese government statistical series. The Uganda case draws primarily on historical narrative for the colonial-era material and on investigative NGO reporting, corroborated across an independent secondary citation, for the contemporary Bukaleba carbon-plantation material; no official Ugandan government dataset on the scale of the 1996–2000 displacement has been identified, and the figures cited (80,000–100,000 hectares leased, approximately 8,000 people displaced) should be understood as originating from a single primary investigative source. The South Africa case draws on the widest and most heterogeneous range of sources of any of the five, spanning peer-reviewed ecology, government statements, an honours thesis, and general reference material; the land-allocation figures central to this report’s South Africa chart (7 percent and 13 percent under the 1913 and 1936 Land Acts respectively) are, by contrast, drawn from multiple mutually consistent sources, including the South African government’s own account of its land-reform history, and are accordingly the most reliably documented single figure in any of the five case studies.

## **Limitations of this Report**

This report does not itself attempt to produce a monetary estimate of colonial ecological damage in any of its five case studies, for the reasons set out above: no such estimate would currently be defensible or comparable across countries. Nor does it attempt a comprehensive review of all fifty-plus African states that experienced colonial rule; its purpose is to demonstrate pattern and scale through five illustrative cases, and to make the case for the methodological work that a comprehensive accounting would require. Where this report cites figures — cumulative oil spill volumes in the Niger Delta, historical forest-cover estimates in Ghana and Uganda, groundnut export shares in Senegal, land allocation shares in South Africa — these are drawn from the secondary and grey literature identified in the References section, are in some cases mutually inconsistent between sources (a point noted explicitly at each such instance below), and should be treated as illustrative of the order of magnitude and trajectory of the damage described, not as an audited or harmonised dataset in their own right. Establishing such a dataset is precisely the task this report recommends be assigned to the technical working group proposed in the Recommendations section.

# 2

## PART TWO

# Five Country Case Studies

---

---

Nigeria · Ghana · Senegal · Uganda · South Africa — a recurring pattern of monoculture, extraction, and abandonment across five colonial administrations.

## COUNTRY CASE STUDY · BRITISH COLONIAL ADMINISTRATION

# Nigeria

Tin and coal mining on the Jos Plateau and in Enugu; cocoa, oil-palm and rubber monoculture in the south; and, in the late-colonial and early-independence period, crude oil extraction in the Niger Delta.

Our examination of Nigeria's experience would be structured thus, the Savannah and Middle Belt of Northern Nigeria, the Forest Belt of Southern Nigeria, and the Niger Delta Belt.

The dominant economic activity in the savannah and middle belt was farming. The land and climate were most suitable for the cultivation of cereals such as millet, sorghum, maize, etc. In the middle belt, yam, cassava, cocoyam were also cultivated. Vegetables, tomatoes, pepper, and onions were universally grown. These crops were planted side by side on to farms. This is called mixed-cropping. The farmers practised irrigation and terracing as farming was intensive. Land was plentifully available relative to the population. Expansion of holdings was limited by technology. Land use was regulated by the ruling traditional and community elite. Also practised was animal husbandry as the households raised goats, sheep, fowls, etc. The cattle Fulani raised cattle. Cattle rearing was mostly combined with crop growing, what is known as mixed-farming. While the crops depended on cow droppings for nutrients, the cows fed on the dried stalks of harvested crops, in addition to the rich grass of the prairie environment. Production was mostly to meet household needs and for local exchange.

Apart from cultivation, raising of domestic animals, and cattle rearing, fishing was done on the rivers. Crafts such as leather work, pottery, mat and thatch making thrived in the region. Iron-smelting and blacksmithing were very significant crafts. They provided implements for the farmers, fishing peoples, and hunters. There was also trade and commerce within and among the communities, and long distance trade with the different peoples of the forest belt and the lower Niger, such as the Yoruba, the Igbo, the Bini and their neighbours. The area was involved in trade across the Sahara desert with the peoples of North Africa. Through the Saharan trade routes they exported food items, leather products, kolanuts, gold, ivory, slaves, etc, and imported trade goods such as mirrors, salt, beads, horses, donkeys, camels, guns and gun powder.

Local trade relations within and among communities and zones ensured intersectoral interdependence, specialisation and expansion, while the Saharan trade routes ensured the participation of the area in international trade as some of the area's exports such as kola nuts and gold were procured from the forest belt while some of their imports were from Europe through the agency of their North African trade partners. It is important to note that the economic life of the people before they were colonised was simple, healthy, and peaceful, although in the nineteenth century it became more and more expansive and sophisticated.

The colonial conquest of Northern Nigeria at the end of the century drastically changed the precolonial situation. Export crops were cultivated all over Northern Nigeria for British factories and plants at home. The major exports of the area were groundnuts and cotton. This meant the area was an agrarian biculture. Some local communities of the area cultivated one crop, this made each of such communities an agrarian monoculture. It should be noted that the colonial economy was commercial and monetised and, hence, survival in the economy was a function of how much cash one had. Consequently, there was massive expansion of export crop planting. The implication was that export crop planting progressively expanded against food crops planting. It must be noted that while the colonial authorities emphasised export crop production there was little or no change in the technology of production. The farmers continued to use their traditional methods and technologies of land use. The continuous expansion of the land areas committed to export agriculture in a monocultural system meant decline in food production. Besides, the massive and extensive exploitation of the land made the land vulnerable for desert encroachment, flooding, and erosion. These closely related phenomena increased the tempo of deforestation and violence on wildlife. They also caused poverty and hardship as food security was undermined.

The violence on the natural environment and the ecosystem as a result of agrarian monoculture and biculture was not the only problem. The development of tin mining on Jos Plateau was another problem on the ecosystem. Tin mining by expatriate companies was vast on the plateau and did not have any prior environmental impact assessment. The effect was the destruction of the land. Mined areas and locations were rendered useless as the topsoil became more toxic waste.

Tin mining was associated with soil wash and erosion on a large scale. As one informed observer noted, "the surface soil, built in the course of thousands of years, has within a generation or two been largely washed away" mining was mostly near the rivers and this caused large scale water pollution. The destructive effect of mining was most deadly on the Birom where mining was concentrated.

Mining was also associated with the clearing of woodland trees for the purpose of producing fuel for the mining companies and to create camps for the companies and their labourers many of who were migrants besides, much of the grass in the area was used as thatching grass for the labour camps.

The Birom and other indigenous people in the mining areas were left with smaller and smaller portions of land for farming, portions already degraded and polluted as a result of mining activities. Yet, the people did not receive any compensation beyond poor wages for the labour they offered to the mining companies. By right of conquest all land had become the property of the colonial state and, hence, the indigenous people and their communities did not receive any royalties. All royalties from the mining companies were paid to the colonial state. Because they were conquered people and subjects, they were not involved in the land deals between the government and the mining companies. While the ecosystem was ruined in the aftermath of massive mining unmitigated because there were no policy safeguards, the indigenous people and their communities bore the brutal brunt. One researcher has drawn our attention to a colonial report on land rehabilitation in Plateau provinces published in the mid 1940s:

At the time of the arrival of the Europeans, the Plateau was savannah woodland. The pagan villages farmed pockets of arable soil and terraced the rocky hillsides. At this time there were few cattle, few immigrants, and a small indigenous population. Under these conditions there was ample grass cover, rainfall was conserved, rapid run off and soil wash were relatively slight, streams were perennial and springs common. The serious source of damage was the annual burning of the bush... with the coming of the European, followed closely by the Fulani, Hausa and other immigrants, the position rapidly deteriorated. The pagan, no longer fearful of attack, abandoned his thrifty but laborious system of intensive farming and adopted shifting cultivation; wholesale clearance of woodland and trees took place also to provide fuel for the mining companies and their labourers and of thatching grass for labour camps; the cattle population increased to such an extent that the area soon became grossly overgrazed; and the loss of woodland led to the use by the pagans of straw, grass and manure as fuel. The combined result has been an accelerating impoverishment of the soil. Soil wash and erosion has (sic) taken place on a vast scale and the surface soil, built up in the course of thousands of years, has within a generation or two been largely washed away.

The rain forest belt of colonial Southern Nigeria had its share of ecological issues. As noted earlier, one of the primary motives of the British in Nigeria was to source raw materials for their factories and plants at home. Consequently, as is the case of Northern Nigeria, emphasis in Southern Nigeria was on export agriculture. The major export crops were cocoa, oil palm, and rubber. Cocoa was the major crop in the western region while oil palm was the major crop in the eastern region. Oil palm and rubber were also planted in the western region while cocoa and rubber were also planted in the eastern region. However, cocoa was so dominant on the agrarian landscape in the western region that the region became a cocoa monoculture, more or less. Similarly, the eastern region was less of either a biculture or polyculture and more of an oil palm monoculture.

Cocoa, oil palm, and rubber are tree crops and as the tree crops they stand permanent on the land. Initially the farmers depended on wild oil palm trees and community palm grooves for harvesting, processing, and sale to the expatriate trading firms which bought up the produce for export. As the demand for the produce rose more and more the colonial authorities began to encourage the farmers to plant oil palm. Cocoa was not wild but was introduced from Ghana and planted by the farmers. The expansion of cocoa and oil palm planting led to the emergence of large scale planting covering continuous stretches of land after two or three decades of planting. Initially plantations emerged through the conversion of food crops farms into tree crops farms after harvesting of the food crops. As the demand for export crops increased and continued to increase in the 1930s - 40s interested farmers, especially the local traditional elite and traders and some urban-based elite began to invest in large-scale plantation agriculture.

The development of plantations was through the clearing of the high forests and woodland while the expansion of tree crops export agriculture produced the following results: (1) reduction in food crops planting, (2) land shortages and disputes over progressively less and portions of community land, (3) the emergence of big rural landholder class and the opposite class of the landless, (4) an assault on the traditional communal land tenure and land use systems, and most important for our present purpose, (5) massive deforestation and destruction of sacred ancestral land and wildlife.

The problem of the fifth result listed above was worsened by lumbering. The high demand for timber and plywood by the expatriate firms encouraged the felling or logging of the trees of the rainforest. The colonial authorities granted licenses to concessionaires to harvest trees. As in the case of mining, the concessionaries paid royalties to the colonial authorities who had become the supreme landlords. Farmers whose crops were destroyed in the process of felling of trees were paid damages. However, the affected farmers were not involved in the determination of the value of the crops destroyed and were thus on the receiving end. Insufficient though the compensation mostly was,



it nevertheless generated its own problem. It was paid in cash which had become fetishised in the monetised colonial economy. Consequently, concessional areas of land gave rise to disputes within and between communities as a result of claims and counter claims to the land.

In Southern Nigeria, some mining was done though not as massive as in the case of Jos Plateau. Coal mining in the eastern region was the major mining activity. The exploitation of coal in Enugu was for the purpose of meeting the fuel needs of the railway corporation. Coal mining impacted negatively in the areas of activity, through the clearing of the forests and woodland and the despoilation of the ecosystem. As in the case of tin mining in Jos Plateau, coal mining in Enugu was embarked upon without any prior environmental impact assessment. This is critical in the explanation for the lack of any official policy measures and instruments to ameliorate the adverse impact of coal mining on the environment. Today, the exploited sites and locations abandoned have all become abysmally economically useless and homes for criminals.

The people of the Niger Delta Belt participated actively in the colonial economy as cultivators of food crops such as yam, cocoyam, cassava, and plantains. The people of the belt also grew vegetables, mellon, okra, and pepper. Besides, they were a fishing people. They distilled dry gin, and made mats, thatch, and baskets from raffia palm fronts and trunks. The belt was rich in oil palm groves from where they produced palm oil and kernels. The coastal parts of the belt were inhabited by the Ijo and the Itsekiri. The upland areas were peopled by the Urhobo, Isoko, Ukwuani, Efik, etc. These groups were associated with the oil palm and rubber industries. The people of the Niger Delta Belt responded to the new opportunities provided by the European trading firms which were readily available to buy up export produce. Much of the arable land was committed to oil palm planting. The region had a long history of oil palm exploitation and, hence, it was known as the oil rivers decades before the establishment of direct colonial rule. With the increasing demand for palm oil and kernels, the people responded by planting more and more of the oil palm. The expansion was through the conversion of the forests and woodland. The accompanying deforestation left the land unprotected and vulnerable to seasonal flooding and erosion. The rainy season is always a bitter experience for the food crops farmers as whole farmlands and human communities are usually swept away into the Atlantic Ocean.

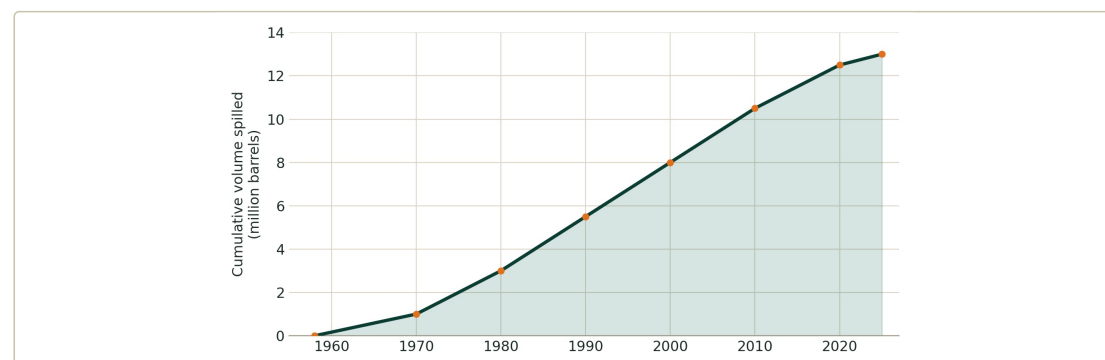
The violence on the ecosystem is, however, most brutally inflicted on the environment by the exploitation of crude oil by the transnational oil corporations such as Shell BP, Agip, Gulf, Texaco, Exxon-Mobil, and Chevron. The exploitation of oil started in the last years of colonial rule and, hence, much of the problem of the belt caused by exploitation of crude oil has been a post-independence phenomenon. But it must be stated that petroleum was discovered in the colonial era and although exploitation began in earnest in the late 1950s, the colonial beginning of exploitation set a despicable precedent that is today, sustained, surpassed, and progressively worsened by the major actors in the industry.

Oloibiri, Bayelsa State, which was the cradle of crude oil production was massively exploited, ruined, and forgotten and abandoned. So bad indeed was the Oloibiri experience that other areas later exploited and similarly abandoned and forgotten in the Niger Delta Belt are metaphorically said to have been Oloibirised.

Since the beginning of crude oil production at Oloibiri, oil exploitation has universally been associated in the Niger Delta Belt with environmental degradation, oil spillage, despoilation of the rivers, streams, and estuaries, and gas flaring. These have all combined to inflict havoc on the ecosystem. The consequence has been that the Niger Delta people and communities cannot gainfully engage anymore in their traditional occupations of farming, fishing, crafts, and trade.

**FIGURE 1**

### Cumulative crude oil spilled in the Niger Delta, 1958–mid-2020s



*Cumulative volume of crude oil spilled in the Niger Delta since the start of large-scale extraction, reconstructed from partial estimates reported across UN, NOSDRA, and peer-reviewed sources (no single continuous official time series exists; commonly cited totals of 9–13 million barrels since 1958 are treated here as converging on an upper-bound estimate of approximately 13 million barrels by the mid-2020s). Life expectancy in the Niger Delta is estimated at 41 years, roughly a decade below the Nigerian national average.*



## COUNTRY CASE STUDY · BRITISH COLONIAL ADMINISTRATION (GOLD COAST)

# Ghana

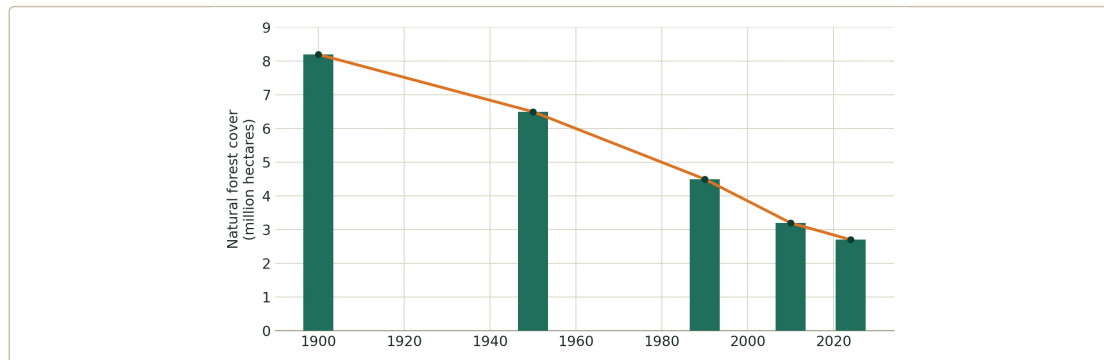
Cocoa monoculture, aggressively expanded by foreign trading firms from the 1870s, alongside gold mining on a growing industrial scale.

As a former British colony in West Africa, Ghana (Gold Coast), has been facing severe deforestation problems for decades. Some of the ecological challenges of Ghana including the climate crisis, are largely attributable to the policies and practices of the imperialists. The lasting ecological shifts initiated during the colonial era are briefly discussed below.

Deforestation, which is the clearing of forests for commercial or industrial activities, has numerous negative impacts on the environment, economy, and society. In Ghana, deforestation contributes to soil degradation, water pollution, and biodiversity loss.”

FIGURE 2

## Ghana's natural forest cover, 1900–2024



*Ghana's natural forest cover has fallen from an estimated 8.2 million hectares in 1900 to approximately 2.7 million hectares today, a decline of roughly two-thirds. Intermediate points are drawn from separate surveys reported in the literature (FAO/CSIR-FORIG data for 1990 and 2010) and should be read as an illustrative trajectory between documented figures, not a continuous measured series; published current-day estimates for Ghana range from 1.5 to 2.7 million hectares depending on survey year and method.*

Vestiges of the ecological damage caused by the policy of monoculture agriculture imposed by Great Britain in Ghana as one of their colonies, are still visible. For instance, the negative ecological impacts of colonialism in the Kukurantumi region of Ghana owing to the partial promotion of cocoa cash crop farming in the country, are quite evident. The expansion of commercial farming, particularly for cash crops such as cocoa, which usually demands cutting down trees to make way for farmland, contributes significantly to deforestation in the cocoa region of Ghana.

The connections between key colonial export crops and climate vulnerability in Ghana and some other parts of West Africa have been explored by Bernards [1]. In particular, Bernards offers brief illustrations from the political economy of cocoa in Ghana, to show how key elements of contemporary climate vulnerability are integral to longer-run patterns of exploitation distinctive of colonial political economies.

Southern Ghana has been identified as the centre of a global cocoa boom between roughly 1870 and 1930 [1]. For several decades the country was the world's largest exporter of cocoa. The cultivation of cocoa in Ghana has been subject to long-run patterns of ecological vulnerability, with soil degradation and pests playing an important role in a cyclical pattern of boom and bust in cocoa production. It has been noted that the intensification of cocoa cultivation in the early twentieth century exacerbated social and ecological contradictions [1]. Even as at then, the British officials, and farmers themselves, frequently raised these concerns. For instance, in a 1926 report, it was noted: “The real problem ... of the cocoa industry in the future is how far the soil has been depleted of the necessary mineral content by the very heavy crops which have been borne in the past ten to twenty years” [5, 1]. As surmised by Bernards [1], “In short, across the history of colonial and postcolonial cocoa production, we can see how overlapping forms of exploitation – linking the formal subsumption of labour and nature with relations of secondary exploitation – have shaped uneven exposure to ecological hazards.”

The aggressive expansion of the cocoa industry—reorganized by foreign firms like Cadbury—led to the mass

clearing of biodiverse rainforests, effectively leading to massive deforestation. This destroyed natural habitats and caused widespread soil depletion.

Colonial rule introduced a notable historical shift in agriculture in Ghana. The British colonial administration transformed diverse local farming systems by aggressively promoting cocoa production. Focusing on a particular cash crop (cocoa) potentially created monoculture vulnerability: Apparently, this situation has forced a significant proportion of farmers into continuous production of singular cash crops (such as cocoa), and reduced agricultural biodiversity, thereby severely locking Ghanaians into ongoing climate risks and market volatility. The ecological implications of monoculture are well-known; the practice is ecologically damaging. It is a commonly known fact that the push for high cocoa yields resulted in massive deforestation in parts of Ghana as native biodiverse forests were cleared for monoculture plantations. This transition led to long-term soil depletion and increased vulnerability to pests and climate shocks. Furthermore, this shift obviously causes resource disadvantage as even today tenant farmers and smallholders continue to bear the brunt of colonial-era land policies, which lock them into repetitive crop cycles with worsening soil degradation.

Ghana is rich in mineral resources, and mining was a major source of revenue for the colonial administration in the country. The colonial powers introduced large-scale, highly intrusive mining operations to extract gold and other minerals, which degraded the landscape, produced air pollution, caused toxic runoff into local waterways, and initiated a legacy of environmental damage that fuels modern illegal mining (locally known as *galamsey*). Historically, gold mining in Ghana has often presented massive environmental and public health costs [6]. Particularly surface mining, which the colonial administration encouraged, led to the destruction of forests and other natural habitats, the repercussion of which still persists today. Since the colonial or pre-independence era, Ghana (Gold Coast), has been experiencing massive damage to its forest, rivers, scenic views and ecosystems by activities of gold miners [6]. Large-scale mining in the country resulted in ecological damage including the displacement of local ecosystems, the clearing of forested lands, and the pollution of major waterways (such as the Pra, Ankobra, and Birim rivers) with heavy metals and toxic chemicals.

The imperialists introduced the use of machinery in cocoa farming. Meanwhile, it is a known fact that the use of heavy machinery, such as excavators, bulldozers, and trucks, causes soil erosion and disrupts the ecological balance. British rule transformed the Gold Coast into a hub for resource exploitation, prioritizing export-driven monoculture and mining over sustainable land management, resulting in deforestation, soil degradation, and vulnerability to climate hazards. The ecological impact of colonialism in Ghana established a legacy of extractive capitalism and ecological imperialism. Apparently, this historical framework—which prioritized the extraction of cash crops and minerals for foreign profit—continues to drive environmental degradation, deforestation, and climate vulnerability in the country today. Large-scale mining and resource extraction in Ghana has a rather lasting ecological impact. Observably, Foreign Direct Investment (FDI) in the mining sector continues this pattern of environmental degradation, as seen with extensive mining operations causing long-term damage to local air, land, and water.

During the colonial era, various parts of Ghana witnessed extensive timber extraction. The high demand for timber and fuelwood in the imperial land led to the indiscriminate cutting of trees. Illegal logging equally took place, a practice that has continued till date. Illegal logging is a significant contributor to deforestation in Ghana. Trees are cut down illegally for commercial purposes, including the production of timber and charcoal. The demand for these products, particularly in urban areas, fuels illegal logging activities.

Unequal Exposure: Colonial-era institutions and export-driven economies shaped how Ghanaians are exposed to climate hazards. In other words, owing to colonial economic policies, which obviously favoured a segment of the populace over others, there is unequal exposure to economic resources and hence ability to respond to climate change. The bourgeoisie who have more access to resources are better equipped to deal with climate and environmental issues than the proletariat who are less endowed and thus more exposed to climate vulnerability. Similarly, there is the concern over gender disparity. The colonial legacy of inequality further institutionalized gender oppression in Ghana, marginalizing female farmers and stripping them of agency, which now severely restricts their ability to adapt to climate-related hazards.

Colonisation seems to be having an enduring impact on Ghana. Today, perhaps owing to the prevalence of colonial mentality, the country is suffering from what could be termed "Toxic Waste Colonialism." While historical colonialism extracted raw materials, modern "waste colonialism" sees the Global North using Ghana as a dumping ground for electronic and plastic waste. Of course, this has serious ecological implications. For instance, Agbogbloshie, located in Accra, has become infamous as one of the world's most polluted e-waste processing sites due to the importation of hazardous electronic equipment. This creates localized environmental crises, emitting airborne pollutants and contaminating surrounding soil and water networks

## COUNTRY CASE STUDY · FRENCH COLONIAL ADMINISTRATION

# Senegal

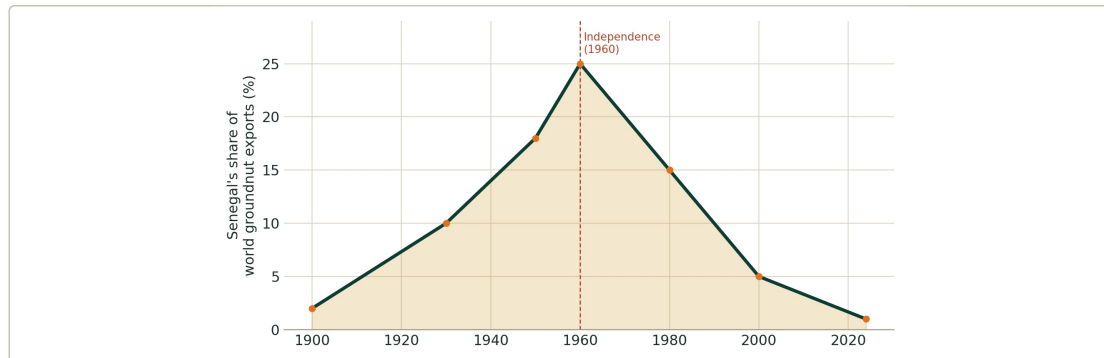
Near-total reorientation of the central and western Groundnut Basin toward groundnut (peanut) monoculture for the French vegetable-oil market.

Senegal's colonial economy, unlike the cocoa economies of Ghana or the tin and coal economies of Nigeria's Plateau and Enugu regions, was built almost entirely around a single crop: the groundnut, or peanut. French colonial authorities and merchant trading houses, operating through the port of Dakar and a chain of inland trading posts along the railway to Saint-Louis and later Bamako, identified the groundnut as the colony's principal export commodity from the mid-nineteenth century onward, and by the early twentieth century had reorganised much of Senegal's arable land and rural credit system around its cultivation. As in the cocoa economy of colonial Ghana, French trading firms extended agricultural inputs and survival goods to Senegalese farmers on credit against the expected harvest, working through networks of local brokers and intermediaries. This system transferred the risks inherent in farming — drought, pest outbreaks, price collapse — from the French merchant houses onto the farmers themselves, while ensuring that the great majority of the value of the crop was extracted for export rather than retained locally.

The scale of this reorientation was substantial. By the 1960s, at the point of independence, Senegal accounted for close to a quarter of the entire world's groundnut exports, and the crop occupied what became known as the Groundnut Basin, a vast belt of central and western Senegal in which groundnut cultivation displaced earlier rotations of millet, sorghum, and fallow land. Colonial administrations actively encouraged the clearing of woodland and savannah to expand the area under cultivation, particularly from the 1930s and again in a further wave of state-encouraged clearing in the 1960s, immediately after independence, as the new Senegalese government initially continued rather than reversed the colonial agricultural model on which the state's foreign exchange earnings depended.

FIGURE 3

## Senegal's share of world groundnut exports, 1900–2024



*Senegal's share of world groundnut exports, from an estimated 2% at the start of large-scale colonial cultivation to a peak of roughly 25% at independence (1960) and a collapse to about 1% today, even as roughly 40% of the country's cultivated land remains dedicated to the crop. Intermediate points between documented anchors (1900, 1960, present day) are an illustrative trajectory, not a measured annual series.*

The ecological consequence of a century of near-continuous groundnut monoculture, concentrated in an already ecologically fragile Sahelian zone subject to recurring drought cycles, has been severe and cumulative. Deforestation to expand cultivable area removed the tree cover — including species such as *Faidherbia albida* and the baobab — that had historically played a central role in maintaining soil fertility and moisture retention in the region's semi-arid conditions. With that cover removed, the region became progressively more exposed to wind erosion, and the reduction of fallow periods in the cropping cycle, driven by the need to maximise groundnut acreage, allowed nutrient depletion to accumulate across successive cycles of cultivation without the recovery time that traditional rotations had allowed. Over the following century, this pattern of monoculture, combined with declining and increasingly erratic rainfall and the encroachment of saline water into freshwater sources near the coast, has produced a marked and continuing rise in soil salinity across large areas of the Groundnut Basin, to the point where significant tracts of formerly cultivable land are now effectively barren. Today, some 40 percent of

Senegal's cultivated land remains dedicated to groundnut cultivation, yet the country produces only a small fraction of the global groundnut exports it once supplied — a stark indicator of the extent to which the resource base underlying that production has been exhausted rather than sustained.

The environmental toll of the groundnut monoculture has combined with the region's underlying exposure to desertification, positioning Senegal firmly within the band of Sahelian and Sahelo-Sudanian countries in which the advance of desert conditions has become one of the defining environmental challenges of the post-independence period. Deforestation, overgrazing, soil erosion, and desertification are now recognised as among Senegal's principal environmental challenges, and it is difficult to disentangle these from the specific colonial decision to organise the national agricultural economy so heavily around a single export crop, cultivated at a scale and intensity that traditional rotation-and-fallow systems had never approached before colonial rule. The rural population most dependent on the Groundnut Basin — smallholder, rain-fed farmers, who continue to make up the large majority of Senegal's agricultural workforce — bears the consequences of this soil exhaustion most directly, in the form of declining yields, an increasing reliance on food imports to meet domestic needs the country once met through more diversified cultivation, and growing vulnerability to the very drought and rainfall variability that the colonial reorganisation of agriculture did nothing to buffer against and, on the contrary, made the rural economy considerably less resilient to.

This structural vulnerability is not merely of historical interest. Comparative research into the colonial economic histories of Ghana and Senegal has shown that the specific, everyday forms of exposure to climate hazards experienced in both countries today — record-high temperatures, unpredictable rainfall, and the disruption of agricultural cycles on which the great majority of the rural population still depends — are directly traceable to the way colonial economies were organised around a small number of externally controlled export commodities, extracted through systems of debt and credit that shielded the colonising economies from agricultural risk while transferring that risk, and its long-run ecological consequences, onto the colonised population. Senegal's national efforts since the 2000s to address this legacy — including reforestation programmes under the country's "Emerging Green Senegal" plan and its participation in the pan-Sahelian Great Green Wall initiative, which aims to restore some 100 million hectares of degraded Sahelian land by 2030 — are best understood not as isolated modern environmental policy, but as a continuing, state-funded effort to remediate an ecological deficit whose origin lies substantially in the colonial reorganisation of Senegalese agriculture around a single export crop.

Restoration efforts undertaken in the Groundnut Basin over the past two decades illustrate both the depth of the damage and the difficulty of reversing it. Programmes centred on the town of Kaolack and surrounding communities have promoted assisted natural regeneration and soil conservation techniques — the deliberate preservation of naturally regenerating trees within cropland, and the construction of stone bunds and gabions to slow water runoff and rebuild topsoil — as an alternative to the clean-cultivation practices that colonial-era and immediate post-independence agricultural policy had encouraged. Field evidence from these programmes indicates that adoption of such techniques can meaningfully increase groundnut and millet yields on degraded land, but also that uptake has depended heavily on direct demonstration and farmer-to-farmer exchange rather than on the top-down administrative encouragement that characterised the original expansion of the monoculture a century earlier — a telling asymmetry between how easily an extractive land-use pattern was imposed and how slowly, and only through sustained local initiative, it can be undone. Some 69 percent of Senegal's rural population continues to depend on rain-fed, small-scale agriculture of the kind most exposed to the soil salinity and erosion documented above, meaning that the population bearing the current cost of a colonial-era land-use decision is not a historical abstraction but the majority of the country's rural workforce today.

## COUNTRY CASE STUDY · BRITISH COLONIAL ADMINISTRATION

# Uganda

Cotton and coffee export agriculture, disruptive mailo land-tenure reform, exclusionary conservation policy, and, in the post-colonial period, carbon-offset forestry.

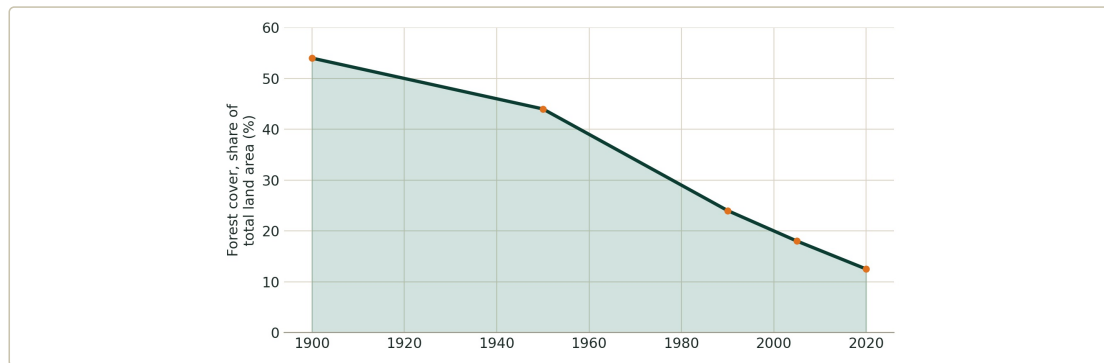
The Republic of Uganda, is a landlocked country in East Africa. It is bordered to the east by Kenya, to the north by South Sudan, to the west by the Democratic Republic of the Congo, to the south-west by Rwanda, and to the south by Tanzania. The southern part includes a substantial portion of Lake Victoria, shared with Kenya and Tanzania. Uganda is in the African Great Lakes region, lies within the Nile basin, and has a varied equatorial climate. In many respects Uganda's modern-day ecological landscape cannot be satisfactorily understood in isolation from the structural transformations imposed during the British colonial period, roughly spanning the establishment of the Uganda Protectorate in 1894 to independence in 1962. Colonial administration, motivated principally by extractive economic necessities and a governance thinking that subordinated ecological considerations to metropolitan interests, restructured land use, resource governance, and human-environment relations in ways whose consequences persist well into the postcolonial era.

This section of the paper contends that colonial rule in Uganda produced an enduring ecological legacy characterized by four interconnected processes: the reorientation of agriculture toward export-oriented monocultures, the disruption of customary land tenure and communal resource management, the establishment of an exclusionary conservation regime, and the acceleration of infrastructure-led resource extraction. Each of these processes appears distinct in origin, joined to produce environmental vulnerabilities that postcolonial Ugandan governments inherited and have struggled to address. Understanding this ecological colonial legacy is therefore crucial to any thoughtful analysis of Uganda's present-day environmental challenges, from soil degradation and deforestation to conflicts over land, water, and wildlife.

Conceivably one of the most substantial colonial intrusions into Uganda's ecology was the reorientation of agricultural production toward export-oriented cash crops, particularly cotton and, later, coffee and tea. Prior to colonization, Ugandan societies practiced varied, subsistence-oriented farming systems regulated to local ecological conditions, incorporating intercropping, fallow cycles, and shifting cultivation as mechanisms for maintaining soil fertility and managing pest pressure. The colonial administration, however, viewed the protectorate primarily as a foundation of raw materials for British industry, and cotton cultivation was aggressively promoted from the early 1900s onward through a combination of taxation policy, compulsory cultivation orders, and the marketing infrastructure of the Uganda Cotton Ginners' Association and later the Lint Marketing Board. This shift toward monoculture had substantial ecological consequences. Continuous cotton cultivation on the same plots, without the rotational and fallow practices characteristic of precolonial agriculture, depleted soil nutrients and reduced organic matter content over time. The colonial emphasis on maximizing land under cash crops also displaced food crops to marginal lands, in some cases pushing cultivation into more ecologically fragile areas such as steep slopes and wetland fringes, a pattern that intensified erosion and wetland deprivation. Coffee cultivation, concentrated in the Buganda and Bugisu regions, similarly encouraged forest clearance on hillsides to expand plantation land, contributing to deforestation in areas such as Mount Elgon. The legacy of this agricultural reorientation persists today in the form of soil tiredness in long-cultivated cash-crop zones and in an agricultural economy still heavily oriented toward export commodities whose price volatility on international markets continues to shape land use decisions. The ecological legacy of colonialism in Uganda culminate in severe historical deforestation that continue to cause environmental health inequalities today. British administrative policies fundamentally altered Uganda's ecosystems by commodifying its natural resources, uprooting indigenous land management practices, and shifting the landscape toward a market-based primary sector.

FIGURE 4

#### Uganda's forest cover as a share of total land area, 1900–2020



*Uganda's forest cover, as a share of total land area, fell from an estimated 54% in 1900 to about 12.5% by 2020. Intermediate points (1990, 2005) are drawn from industry and conservation-sector reporting rather than a single continuous national survey and should be treated as an illustrative trajectory pending verification against FAO or Global Forest Watch time series.*

Closely related to the above was in the area of colonial land policy that added deep-rooted ecologically unsettling patterns through the imposition of new tenure systems, most notably the mailo land tenure system established under the 1900 Buganda Agreement. Mailo tenancy changed what had hitherto been a complex system of customary rights, in which land use was governed by kinship obligations, clan authority into a regime of private freehold ownership vested in a moderately small class of Baganda chiefs and notables with its attendant ecological consequences.

The privatization of land under mailo tenure, by contrast, incentivized individual landholders to maximize short-term returns, often through the leasing of land to tenant cultivators (the *basimba*) who had little long-term stake in the land's ecological condition and correspondingly little incentive to invest in its sustainable management. The postcolonial land tenure system in Uganda remains fragmented and contested in large part because of this colonial inheritance, and disputes over mailo land continue to complicate contemporary efforts at land use planning and agricultural reform in modern day Uganda.

And yet another was colonial Uganda's ecological legacy forestry and wildlife. In the opening years of the twentieth century, the colonial administration created an extensive network of forest reserves and game reserves, later formalized through legislation such as the 1930s Game Ordinances and the creation of protected areas including Queen Elizabeth National Park (originally Kazinga National Park) and Murchison Falls National Park. These measures were often framed in the language of conservation drawing on emerging European conceptions of desert preservation and management.

In reality, however, these protected areas frequently entailed the compulsory removal of the indigenous communities from lands they had long inhabited, cultivated, or used for grazing, hunting etc. The Batwa communities displaced from forest areas that would later become Bwindi Impenetrable and Mgahinga Gorilla National Parks represent a particularly well-documented instance of this pattern, though similar processes of displacement occurred in numerous forest reserves across the country.

Notwithstanding its immediate social consequences, colonial conservation policy produced a lasting split in Ugandan environmental governance, one in which conservation and human livelihood came to be treated as essentially in opposite. Protected areas were regarded as spaces to be isolated from human use rather than integrated into surrounding land use systems, an approach that stood in marked difference to precolonial resource management, which had generally treated conservation and subsistence use as complementary rather than competing objectives. These national parks colonial legacy remain a persistent source of conflict, manifesting in disputes over crop-raiding by wildlife, restricted access to forest resources, and disputed reward claims.

Another dimension of colonial ecological legacy was particularly the construction of railways and roads linking productive hinterlands to export routes at the coast. The Uganda Railway, extended from Mombasa to Kisumu and subsequently connected to the protectorate's interior through further rail and road links, was built obviously to facilitate the movement of cash crops and raw materials to international markets. While often celebrated as a huge colonial achievement, the railway and its related infrastructure had momentous ecological consequences. Transport corridors enhanced resource extraction by rendering earlier remote forest and mineral resources commercially viable thus timber extraction expanded considerably once rail and road access reduced transport costs.

These corridors also enabled extensive in-migration, as cultivators and laborers moved into areas newly opened to commercial agriculture and savanna habitat into farmland. Wetland areas along transport routes were encroached upon to accommodate expanding settlement and cultivation. The development, continue to shape patterns of land

use, population distribution, and resource pressure in present-day Uganda. Thus, postcolonial Ugandan governments inherited not simply a set of environmental problems, such as degraded soils, diminished forest cover, and contested land boundaries, but the fundamental institutional frameworks and economic dependencies that had engendered them.

A further dimension of Uganda's ecological legacy is more recent, and illustrates that the colonial pattern of land appropriation for the benefit of external economic interests did not end with independence. In 1996, the Norwegian forestry company Tree Farms AS established a subsidiary, Busoga Forestry Company Ltd, to develop industrial pine and eucalyptus plantations in the Bukaleba Forest Reserve on the shores of Lake Victoria, explicitly marketed as a carbon-offset project under the emerging framework of the 1997 Kyoto Protocol. Investigative research published in April 2000 by the Norwegian environmental organisation NorWatch, in a report titled "CO2lonialism: Norwegian Tree Plantations, Carbon Credits and Land Use Conflicts in Uganda," documented that the Bukaleba project leased between 80,000 and 100,000 hectares of land from the Ugandan authorities on fifty-year terms and, in the course of establishing the plantation, evicted an estimated 8,000 people from thirteen villages, mainly subsistence farmers and fisherfolk, who lost access to the land on which their livelihoods depended. The NorWatch report noted that Ugandan authorities had, at the time, virtually no independent capacity to assess the value the company stood to generate through the eventual sale of carbon credits, and that the fifty-year lease term effectively removed the land from any alternative use the country might otherwise choose to make of it, for the length of an entire generation. Because the carbon credits generated by the plantation were sold to Northern buyers, Uganda itself could not count the same carbon sequestration toward its own future international climate commitments — the credit, once sold, belonged to the purchaser, not to the country whose land and displaced population had produced it.

It is this project, and the pattern it exemplifies, that supplied the term this Center's wider report on colonial ecological damage takes as its title. The coinage "CO2lonialism" is not a rhetorical device applied retrospectively to colonial-era extraction; it was coined specifically to describe this Ugandan case, and the pattern it names — external capital acquiring long-term control of African land under the banner of a global environmental good, on terms the local population had little capacity to negotiate or contest, with the resulting asset value flowing outward rather than remaining with the people whose land and labour produced it — is, this report argues, structurally continuous with the colonial land and resource concessions documented elsewhere in this report, projected forward from the tin, cotton, and timber concessions of the colonial era into the carbon markets of the twenty-first century. Independent assessment of the Bukaleba project's own viability, cited in the same NorWatch reporting, concluded that it represented a "loss-loss" outcome even on its own commercial terms — poor forestry returns combined with acute social conflict — reinforcing the pattern, familiar from the colonial cases examined elsewhere in this report, of extraction that serves external investors' interests while leaving the local population and the local ecosystem worse off than before.



## COUNTRY CASE STUDY · BRITISH / DUTCH SETTLER AND APARTHEID ADMINISTRATIONS

# South Africa

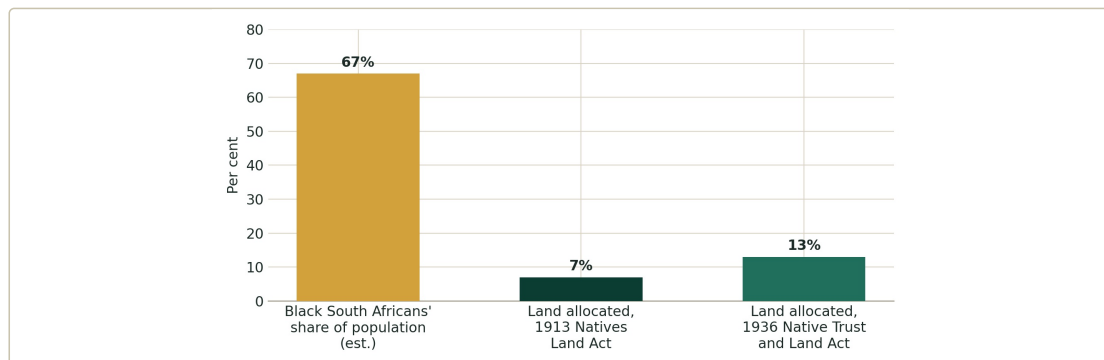
Land expropriation under the 1913 and 1936 Land Acts, industrial-scale mining on the Witwatersrand, commercial forestry, and the introduction of invasive plant species.

Colonialism had a profound and lasting impact on South Africa's environment. European colonial powers, followed by apartheid-era policies, reshaped land use, resource extraction, and settlement patterns in ways that continue to create ecological challenges today. Exploring how colonial policies affect modern climate change adaptation reveals why environmental vulnerability is so deeply unequal in South Africa today. Colonial-era resource extraction, land laws, and infrastructure design created a structural "adaptation deficit" that leaves marginalized communities disproportionately exposed to climate risks. [7] Colonialism in South Africa fundamentally transformed the region's ecology to serve European economic interests. The ecological footprint of colonialism left several specific, long-lasting legacies. It caused the displacement of indigenous populations, extensive land degradation from mining and monoculture, the introduction of invasive species, and the establishment of extractive systems that continue to fuel modern environmental vulnerabilities. [8, 9, 10, 11, 12] Some specific major ecological effects of colonial and apartheid policies and practices in South Africa are highlighted below.

In 1913 the Natives Land Act was introduced in South Africa. This Act forced indigenous African communities onto marginal, resource-poor reserves. This broke traditional, sustainable land-use practices and caused severe overcrowding, soil erosion, and agricultural collapse in these regions. [13, 14, 15, 16, 17]

FIGURE 5

## Land allocated under South Africa's Natives Land Acts, relative to population share



*Under the 1913 Natives Land Act, Black South Africans — comprising an estimated two-thirds of the population — were restricted to roughly 7% of the country's land, a share raised to about 13% under the 1936 Native Trust and Land Act; the White minority, roughly a fifth of the population, retained the remainder. Population-share figures are rounded historical estimates and should be checked against contemporaneous census data before final publication.*

The policy of land alienation and displacement meant that many African communities lost access to land that had traditionally been managed through local systems. Colonial and apartheid governments in South Africa frequently designated land for settlers, plantations, or game reserves. The consequences included overcrowding in remaining areas, overgrazing and soil erosion, breakdown of traditional environmental management practices.

Like many other African societies, the South Africans, before the advent of colonialism, had developed local techniques for managing landscapes, including controlled burning and rotational grazing. Colonial authorities often prohibited or restricted these practices because they were viewed as unscientific or destructive. In some areas, this contributed to ecological challenges such as altered vegetation patterns, increased wildfire risks, and reduced ecosystem resilience.

Colonial governments established protected areas and game reserves, some of which helped preserve wildlife. However, these policies often excluded local communities from lands they had traditionally held and used. For example, the creation of parks such as Kruger National Park in South Africa formed in 1926 involved restrictions on local land use and resource access.

The late-19th-century mineral revolution (beginning with diamonds in Kimberley and gold in the Witwatersrand) led



to aggressive, unregulated mining. This resulted in widespread deforestation to build mines and generate energy, and left a toxic legacy of heavy metal contamination and acid mine drainage that local municipalities still battle. [18, 19, 9]

Like in other parts of Africa, colonial settlers in South Africa introduced various non-native plant species (like eucalyptus, pine, and wattle) for timber and agriculture. This development decimated the indigenous scrubland characteristic of the western Cape area of South Africa, consisting of bushes resembling heaths with hard leaves. Today, water-thirsty alien species with which the native fynbos biome was replaced, consume billions of liters of water annually and fuel devastating wildfires. [20, 21, 22, 23, 12]

Traditional, drought-resistant indigenous crops (such as sorghum and millet) were systematically sidelined in favour of cash crops like maize and cotton. This practice has fundamentally led to altering soil nutrients and regional water dynamics. [24, 11]

Early "fortress conservation" strategies introduced by the imperialist administrations in South Africa involved displacing local communities from their ancestral lands to establish protected game reserves (like Kruger National Park). This often criminalized indigenous hunting and sustainable land-management practices, a social-ecological rift that post-apartheid South Africa is still navigating.

Colonialism and apartheid encouraged unregulated, intensive mining of mineral resources such as gold, coal and diamonds in South Africa. Mining is one industry that completely transformed South Africa's landscape to fuel the colonial economy. Gold mining in particular left toxic legacies and deep scarring. The Witwatersrand gold rush (starting in 1886) created a massive, extractive infrastructure that permanently altered the region's geology and water systems. In general, mining activities in the country have caused a lot of ecological problems including land degradation, land subsidence, habitat destruction, mining pollution leading to environmental toxicity. Today, many places in the region suffer from Acid Mine Drainage (AMD), heavy metal contamination, water pollution. Acid Mine Drainage (AMD) equally occurs whereby flooded, abandoned gold and coal mining shafts from the colonial mineral revolution continuously leak highly acidic pollutants, heavy-metal-dense water that reacts with sulfide minerals to create highly acidic water. This toxic mix leaks into major local river systems and underground water tables, thereby threatening local drinking supplies. Vast, unlined mine tailings (dust dumps) sit near urban areas, causing heavy metal pollution by blowing toxic uranium, arsenic, and lead into surrounding communities. Similarly, decades of aggressive deep-level tunneling destabilized the upper crust, causing crustal instability, sinkholes and tremors that still threaten infrastructure. [25] The risky scenario is further compounded by climate change. Rather expectedly, climate change brings intense, unpredictable rainfall events that cause these toxic mine tailing dams to overflow, spilling pollutants directly into vulnerable communities nearby.

This is another colonial industry that has left deep scars on the physical landscape of South Africa. Colonial authorities cleared native woodlands to plant fast-growing European and Australian trees to supply timber for mine props and railway ties. The region equally witnessed massive fynbos destruction. Pine, eucalyptus, and wattle plantations replaced highly biodiverse indigenous ecosystems, particularly in the Western and Eastern Cape. The replacement of native scrubland with water-thirsty alien species caused severe water scarcity. Non-native trees consume vastly more groundwater than indigenous flora, drying up local streams and lowering water tables in an already arid country. [26] Another consequence of replacement of indigenous flora species with foreign ones is increased fire risk. Invasive colonial trees burn hotter and faster than native vegetation, leading to more frequent, unmanageable, and devastating wildfires

South Africa is one of the world's most biodiverse countries, but colonial expansion led to environmental challenges like habitat destruction, hunting of wildlife, conversion of natural grasslands into farms, fragmentation of ecosystems, many native species declined as a result. Large areas of indigenous forests were cleared for various purposes such as agriculture, timber production, urban expansion, railway construction, etc. The loss of forests reduced biodiversity and increased erosion.

The issue of water insecurity and infrastructure colonialism in South Africa equally deserves attention. Colonial and apartheid water laws tied water rights directly to private land ownership [27]. In the main, the highly centralized water infrastructure was engineered to serve white-owned commercial farms, mines, and wealthy urban centers, bypassing indigenous territories. [28] Even till date, during severe droughts (like Cape Town's "Day Zero" or the recent Eastern Cape water crises), marginalized communities face immediate water scarcity because they rely on fragile, peripheral infrastructure that lacks climate resilience. [29, 30, 31]

Spatial apartheid was practised in South Africa, giving rise to marginalized settlements. The colonial and apartheid regime forced a large portion of the indigenous South African populace to a small portion of designated overcrowded areas. The legacy of the 1913 Natives Land Act and apartheid Group Areas Act forced Black South Africans onto floodplains, steep slopes, and arid fringes. [32, 33] They took fertile land from African communities and concentrated them into overcrowded reserves. Forcing millions of people onto just 13% of the country's land (the former "Homelands") caused intensive farming, severe overgrazing, poor land management, which led to

agricultural land degradation, severe soil erosion, declining soil fertility, and food insecurity. [34] These historically segregated areas suffer infrastructure deficits, lacking storm-water drainage, paved roads, and green spaces, making them highly vulnerable to deadly flash floods (like the 2022 KwaZulu-Natal floods). Furthermore, informal settlements are predisposed to heat vulnerability. They lack tree canopies and use heat-trapping materials like corrugated iron, turning these neighborhoods into severe urban heat islands during heatwaves [35, 36, 37] Moreover, topsoil degradation makes these regions highly vulnerable to desertification and loss of climate resilience as rainfall patterns become erratic. [38] Many degraded landscapes still require restoration.

European settlers introduced non-native plants and animals for farming, forestry, and ornamental purposes. Some invasive plants, such as species of eucalyptus, pine, and wattle, now consume large amounts of water, displace native vegetation, increase wildfire risks. The colonial shift away from diverse, drought-resistant indigenous crops (like sorghum) to water-intensive maize creates a situation of monoculture vulnerability and could cause modern droughts capable of triggering immediate, widespread food insecurity. [39]

Colonial authorities built dams and irrigation systems mainly to serve commercial farms and mining operations. Rivers were diverted and wetlands drained. This contributed to water shortages and unequal water distribution that persist today.

Colonial economies focused on exporting raw materials rather than sustainable resource management. This resulted in a number of environmental problems including overgrazing, overfishing, excessive timber harvesting, mineral depletion.

Colonial urban planning created segregated cities where Black communities were often located in environmentally vulnerable areas with a couple of environmental challenges like poor sanitation, inadequate waste management, greater exposure to pollution, limited green spaces, many of these inequalities remain visible today.

South Africa has some serious environmental problems. Such problems include uncontrolled livestock grazing, rampant urban development, and surface disturbance and pollution associated with mining. Many problems originated from political and socioeconomic policies associated with the apartheid period that ended in 1994. Apartheid policies forcing black people to live in separate homelands, called bantustans, led to overpopulation in these areas. Intensive settlement, livestock grazing, fuelwood cutting, and overfarming on limited areas of land in turn led to soil erosion, land degradation, deforestation, desertification, and bush encroachment (proliferation of bush vegetation of little value for grazing). These problems are prevalent in the Eastern Cape and KwaZulu-Natal [40].

The ecological effects of colonialism continue to influence South Africa through persistent land inequality, water stress, climate vulnerability, pollution from historical mining, ongoing biodiversity loss, high costs of ecological restoration. Like in other colonised parts of Africa, colonialism transformed South Africa's natural environment by prioritizing resource extraction and settler agriculture over sustainable land management. The resulting challenges such as land degradation, pollution, loss of biodiversity, invasive exotic species, and unequal access to natural resources remain significant environmental problems that the country continues to address through conservation, land restoration, and environmental policy.

The persistence of water stress named above as a legacy of colonial and apartheid-era land policy is not an abstraction. Research into post-apartheid municipal water provision has documented cases in which the geography of the old bantustan and township system continued to determine who could, and could not, afford to remain connected to the water network. In one documented instance from KwaZulu-Natal, a woman living in a township established under apartheid-era resettlement policy — the same policy responsible for the overcrowding, soil erosion, and loss of traditional land management discussed above — had her household's water disconnected in early 2000 after falling behind on payments she could not afford, precisely because resettlement had left her, like many former township residents, without access to land on which to grow food or raise income independently of the cash economy that the apartheid-era homeland system had been designed to force her into. Her case became part of a wider legal and scholarly literature on water rights in post-apartheid South Africa, illustrating how a colonial-era spatial planning decision — where people were and were not permitted to live — continues to determine, more than a century later, who bears the cost of an increasingly water-stressed climate and who does not.

## Cross-Case Synthesis

Having presented the five case studies individually, it is worth pausing before turning to the methodological argument that follows to draw out, explicitly, what they show when read together rather than in sequence.

**A common underlying mechanism, applied to different commodities.** In every one of the five cases, the specific commodity around which the colonial economy was organised differs — tin and coal in Nigeria's Plateau and Enugu regions, cocoa in Ghana, groundnuts in Senegal, cotton and coffee in Uganda, gold and land itself in South Africa — but the underlying mechanism recurs with striking consistency: a colonial administration or licensed private concern identifies a single commodity capable of meeting metropolitan industrial or consumer demand; production of that commodity is expanded far beyond the scale and intensity that precolonial land-use systems had ever approached, whether through compulsory cultivation orders (Uganda), concessionary land grants (Nigeria, South Africa), or a credit-and-debt system that transferred agricultural risk from merchant houses onto farmers while capturing the resulting value for export (Ghana, Senegal); and the resulting ecological cost — soil exhaustion, deforestation, water contamination, biodiversity loss — is borne overwhelmingly by the local population and local ecosystem, with no meaningful programme of environmental remediation undertaken by the colonial administration responsible. This is not a coincidence of five independently occurring histories; it is a single economic logic, described in general terms in this report's Introduction, expressed through five different commodity markets and five different colonial administrations.

**A common temporal signature: acceleration, then abandonment.** Each case also displays a similar temporal pattern, visible directly in this report's own charts. Senegal's groundnut export share rises sharply from the early twentieth century to a peak at the moment of independence, then collapses over the following six decades as the underlying resource base — in this instance, soil fertility — is exhausted. Ghana's and Uganda's forest cover follow the mirror-image trajectory: a slow initial decline giving way to accelerating loss across the twentieth century as transport infrastructure and administrative encouragement made previously inaccessible forest commercially viable. Nigeria's Niger Delta oil-spill volume follows a monotonically rising trajectory that has, unlike the other four cases, never peaked and reversed, precisely because — as the Nigeria case study documents — the extractive pattern established at Oloibiri in the colonial period was inherited rather than interrupted by independence, and has continued to intensify. South Africa's land-allocation figures are the exception that proves the general rule: because the 1913 and 1936 Land Acts fixed a legal allocation rather than depleting a renewable resource, the relevant "damage" in that case is not a declining trend but a persistent structural ratio, which is precisely why it required a different form of chart (a comparison, not a time series) to display. Read together, these five trajectories suggest that "colonial ecological damage" is not a single kind of harm requiring a single kind of metric, but a family of related harms — resource depletion, habitat loss, structural allocation — that a harmonised methodology will need to accommodate with more than one measurement framework, an observation that reinforces this report's Bradshaw-derived distinction between proportional and absolute impact and suggests that distinction alone will not be sufficient.

**Uneven documentation, not uneven damage.** The disparity in the quality and quantity of citation across the five cases, discussed at length in the Methodology and "Toward a Harmonised Methodology" sections below, does not track the apparent severity of the damage described. Uganda's case, reliant substantially on a single investigative NGO report for its most vivid and specific evidence (the Bukaleba displacement), describes an episode no less serious than Ghana's more heavily footnoted deforestation figures; Nigeria's Niger Delta narrative, built on directly quoted colonial administrative correspondence, is in some respects more evidentially direct than South Africa's citation-dense but source-heterogeneous account. This report is at pains to make this point explicitly because it is the reverse of what a superficial reading of the five cases side by side might suggest: a country's case should not be judged more or less severe, in a future harmonised accounting, on the basis of how many citations its available literature happens to support. This is exactly the distortion a harmonised, purpose-built data-collection methodology — rather than an opportunistic assembly of whatever secondary literature happens to exist — is designed to correct.

**A widening rather than narrowing gap over time.** Finally, in three of the five cases where a modern comparison point is available — Senegal, Ghana, and Uganda — the trajectory of damage has not merely persisted since independence but has in some respects widened. Ghana's most recent annual deforestation figures (2018–2022) show rates of loss higher, not lower, than the mid-twentieth-century average; Uganda's 1996–2000 Bukaleba episode demonstrates that colonial-pattern land appropriation recurred, in a new institutional form, more than three decades after independence; and Senegal's food-import dependency, a direct consequence of soil exhaustion in the

Groundnut Basin, has grown rather than shrunk since the 1960s. This has a direct bearing on how the “colonial” framing of this report’s title should be understood: this report does not argue that all of the damage documented in its five case studies occurred during the formal colonial period and stopped at independence. It argues that the initiating cause — the specific policy, concession, or land-use pattern imposed under colonial administration — was colonial, and that the ecological consequences of that initiating cause have, in several of the five cases, continued to compound under conditions (a reduced local capacity to invest in remediation, continued exposure to international commodity markets on unfavourable terms) that are themselves a legacy of the same colonial economic structure. A harmonised methodology will need a principled way of apportioning damage between the original colonial-era decision and its long tail of post-independence consequences; this report’s recommendation that the technical working group treat attribution as a central methodological task, rather than an afterthought, follows directly from this observation.

# 3

## PART THREE

# Toward a Harmonised Methodology

---

---

Why five differently-compiled case studies cannot be added together as they stand, and what an African Union-benchmarked methodology would need to look like.

# Toward a Harmonised Methodology

## Observed Methodological Approaches Across the Cases Presented

Even within the five case studies presented in this single report, prepared under the direction of one research centre with a shared underlying purpose, three distinct methodological approaches are visible. The Nigeria and Uganda case studies rely primarily on continuous historical narrative, reconstructing the ecological consequences of specific colonial policies — tin mining on the Jos Plateau, coal extraction at Enugu, the reorientation of Ugandan agriculture toward export cotton and coffee, and, in Uganda's case, a contemporary carbon-market land transaction — from archival, secondary historical, and investigative sources, with limited use of quantitative environmental indicators outside the illustrative time-series charts prepared for this report. The Ghana and Senegal case studies draw more heavily on recent peer-reviewed literature in environmental and development economics, citing specific studies of soil degradation, deforestation rates, climate vulnerability, and agricultural history with explicit academic references. The South Africa case study draws on a still wider and more heterogeneous body of sources, ranging from peer-reviewed ecological studies to government statements, advocacy publications, general web-based reference material, and an undergraduate honours thesis addressing post-apartheid water rights.

None of these three approaches is illegitimate on its own terms; each reflects a reasonable use of the literature available on a given country. The difficulty is that the same underlying phenomenon — say, “deforestation attributable to colonial-era commercial extraction” — is documented very differently across the five cases: in some as a qualitative historical narrative with an approximate date range, in others by reference to a specific published rate or area figure, and in others still without any quantification at all. If this report's five cases were now to be extended, as this section recommends, to the full set of countries affected by colonialism across Africa and beyond, this same divergence of method would recur and compound at a much larger scale, with different national research teams working from different literatures, different national data infrastructures, and different disciplinary traditions.

A further, concrete illustration of this divergence, internal to this report itself, is the inconsistency of the individual figures used in the country cases. The literature on Ghana's forest cover, for instance, cited in this report's own Ghana case study and its accompanying chart, gives current-day forest area estimates ranging from roughly 1.5 million to 2.7 million hectares depending on the source and survey year — a spread of nearly a factor of two, even though every cited source agrees on the starting figure of approximately 8.2 million hectares in 1900. The literature on Niger Delta oil spill volumes shows a comparable spread, with cumulative totals cited across the sources consulted for this report ranging from 9 million to 13 million barrels, and annual averages calculated from different sub-periods and different subsets of the delta. These are not failures of the individual sources; they reflect genuine differences in survey method, time period, and geographic scope across studies that were never designed to be aggregated into a single, continent-wide account. They illustrate precisely the scale of harmonisation work required before a comparable claim across countries becomes possible.

## The Comparability Problem

This divergence of method is not a stylistic inconvenience to be corrected in a later editorial pass. It is the central obstacle standing between the pattern of damage this report documents and any credible monetary valuation of that damage. A monetary claim, by its nature, must aggregate: it must add together the damage documented in one country with the damage documented in another to arrive at a total. That aggregation is only meaningful if the underlying quantities being added are measured in comparable units, using comparable methods, applied to comparably defined categories of harm. Where they are not — where one country's contribution to the total rests on a narrative estimate of “extensive deforestation” and another's rests on a specific measured rate of forest loss over a specific period — the resulting total is not a rigorous estimate of aggregate damage; it is an artefact of which countries happened to have the more quantitatively documented literature available to the researchers who wrote up that particular case.

The closest available precedent for how sensitive a multi-country environmental index can be to exactly this kind of methodological choice is instructive here. In constructing composite rankings of environmental impact across 228

countries using seven internationally standardised metrics, Bradshaw, Giam, and Sodhi found that simply removing any one of those seven metrics from an otherwise carefully harmonised index shifted country rankings by an amount corresponding to a correlation, against the full index, of as low as 0.70–0.81 for some metrics — a material re-ranking of countries, even where every metric used was already collected on a comparable global basis by international agencies. If a formally harmonised index is that sensitive to which of a small number of well-defined metrics is included, an informal aggregation of national case studies using no common metrics at all — as the present report's five cases, considered together, would be if simply added up — cannot be expected to produce a monetary total that any government, court, or international body would treat as authoritative. Monetary evaluation of colonial ecological damage is possible only once national approaches and their underlying results are harmonised; until then, the most defensible claim this report or any successor to it can make is a qualitative and comparative one: that the pattern of damage is real, recurrent, and documented, not that its magnitude in any one country can currently be added to its magnitude in another.

It is worth noting, however, that the comparability problem this report describes is a problem of methodology, not of feasibility in principle. The Kenya montane forest study discussed in the Methodology section above demonstrates that historically-anchored, GIS-based reconstruction of colonial-era environmental change is achievable at fine spatial and temporal resolution when the underlying archival and remote-sensing sources are assembled deliberately for that purpose, rather than inherited piecemeal from studies designed for other ends. Similarly, the Hickel et al. unequal-exchange study demonstrates that translating physical resource flows into a defensible aggregate monetary figure, across dozens of countries and multiple resource categories simultaneously, is achievable using established input-output and trade-accounting methods. Neither precedent was built for the specific purpose this report has in mind, but together they show that the two halves of the task — historical physical reconstruction, and monetary valuation of the resulting physical record — each have working methodological templates already available in the literature. What is missing is not a demonstration that either half is possible, but a coordinated effort to apply both, in a harmonised and mutually consistent way, specifically to the question of colonial ecological damage.

## **The Case for a Jointly Agreed African Union Benchmark**

This report accordingly recommends that a unified, harmonised methodology be developed and formally agreed at the African Union level, rather than left to develop informally and unevenly across individual national research efforts or advocacy campaigns. Four considerations support locating this effort specifically at the AU level, rather than at the level of an individual country, a subregional body, or an international NGO.

First, only an AU-level process can produce a benchmark that is genuinely comparable across the diversity of colonial administrations, resource endowments, and post-independence trajectories represented across the continent — precisely the diversity that this report's own five cases, spanning British and French colonial administrations and West, East, and Southern African contexts, were chosen to illustrate. A methodology developed by or for a single country risks encoding that country's particular data availability and historical circumstances into what should be a general standard.

Second, the African Union is, at the time of writing, already engaged in a directly relevant institutional process. The July 2025 decision of the African Ministerial Conference on the Environment to list ecocide among the continent's top priorities for 2025–2027, and to convene an ad hoc committee to examine the classification of “massive destruction of environmental ecosystems” as a crime, creates both the institutional venue and the timeline within which a harmonised damage-measurement methodology could be developed and formally proposed. A methodology of the kind this report recommends, submitted to inform that committee's 2027 report, would arrive at exactly the point in the AU's own process where a technical definition of what counts as serious, quantifiable environmental destruction is required.

Third, an AU-benchmarked methodology would carry a form of political and diplomatic weight that no single country's internal assessment, however rigorous, could match when the resulting figures are eventually presented to former colonial powers, international courts, or international financial institutions as the basis for a claim. Continent-wide agreement on the underlying methodology removes the objection, otherwise readily available to a respondent government, that the figures reflect one claimant country's own methodological choices rather than an internationally defensible standard. The Nauru precedent discussed earlier in this report is instructive on this point precisely because it was a single-country claim: Australia's preliminary objections in that case turned in part on procedural questions specific to Nauru's particular trusteeship arrangement, questions that a jointly agreed, continent-wide AU framework would not need to relitigate country by country.

Fourth, a harmonised AU methodology would allow the resulting evidentiary record to be used flexibly, across whichever legal, diplomatic, or financial channel ultimately proves most effective — whether that is a future amendment to the Rome Statute, a domestic ecocide prosecution of the kind increasingly available under the

national laws discussed in the Precedents section, a state-to-state claim modelled loosely on Nauru's, or a dedicated climate and ecological finance mechanism negotiated alongside the kind of international climate finance architecture discussed in the Recommendations section below. A methodology built for only one of these channels would need to be substantially reworked to serve the others; a methodology built to the general evidentiary standard set out in the IAIA Best Practice Principles discussed above would not.

This report therefore recommends, in the Recommendations section below, that a technical working group — modelled on the interdisciplinary composition and best-practice principles set out in the Methodology section above — be convened under African Union auspices, with the explicit purpose of developing a harmonised methodology for quantifying colonial ecological damage across all countries affected by colonialism, timed to inform the ad hoc committee's report to the African Union in 2027.



# Conclusions

---

Every reparations claim advanced to date — for slavery, for colonisation, for the atrocities documented in cases ranging from Japanese American internment to the Mau Mau rebellion — has been built on a calculus of direct loss: lives taken, people sold into bondage, artefacts and valuables removed, minerals extracted and shipped abroad. This report has argued that this ledger is incomplete, not because it overstates colonial harm, but because it omits an entire category of damage that is harder to see, harder to price, but no less real: the long-term ecological damage inflicted by colonial economic policy on the land itself. The five case studies presented in this report — Nigeria, Ghana, Senegal, Uganda, and South Africa — show that this damage follows a recognisable and recurring pattern across different colonial administrations and regions: the forced or incentivised imposition of export monoculture, undertaken without regard for its effect on soil fertility and traditional land-use systems; unregulated extraction of solid minerals, undertaken without environmental assessment or remediation; the clearing of forest, wetland, and wildlife habitat to expand plantation agriculture and commercial forestry; and, in South Africa, the explicit legal engineering of land access itself, through instruments such as the 1913 and 1936 Land Acts, to concentrate environmental burden on the dispossessed majority population. In every case examined, these processes produced deforestation, soil erosion and exhaustion, and in several cases desertification, salinisation, and water insecurity, whose consequences did not end with independence and continue to compound today, expressed most immediately in each country's heightened vulnerability to present-day climate hazards.

This report's Uganda case further establishes that this pattern has not remained confined to the historical colonial period. The 1996–2000 Bukaleba carbon-plantation episode — in which a Norwegian company leased tens of thousands of hectares of Ugandan land on fifty-year terms and displaced thousands of residents, in a transaction that gave rise to the term “CO2lonialism” now attached to this report's title — demonstrates that the underlying structure of colonial-era extraction, in which external capital acquires long-term control of African land and resources on terms the local population has little power to negotiate, persists into contemporary carbon markets. Any future accounting of colonial ecological damage, this report suggests, should be alert to the risk that the same structure recurs under new institutional cover, including within the very climate-finance and carbon-offset mechanisms increasingly proposed as instruments of redress.

This report's second central finding is that the international legal and institutional environment for addressing this category of damage has shifted substantially, and recently. The emergence since 2021 of a working legal definition of ecocide, its adoption into binding or soon-to-be-binding instruments at the European Union and Council of Europe level, and — most directly relevant to this report — the African Union's own 2025 decision to examine the classification of “massive destruction of environmental ecosystems” as a crime, together create a genuine and time-limited window in which a claim of the kind this report describes could be advanced with a plausible institutional destination. This report has also identified a directly on-point precedent — the *Nauru v. Australia* case before the International Court of Justice — establishing that a claim of this specific type, brought by a former colony against a former colonial administrator exclusively over unrehabilitated environmental damage, is not a novel legal theory but a form of claim that has already been brought, defended, and settled.

This report's third finding, however, is a note of methodological caution that should govern how that window is used. The five case studies presented here were compiled using visibly different methods, and this divergence — far from being a minor presentational inconsistency — is representative of a much larger problem that would recur, and compound, were this report's approach extended across the many other African states that experienced colonial rule. No monetary valuation of colonial ecological damage is currently possible, or would currently be defensible, because no harmonised methodology yet exists for measuring it on a comparable basis across countries. At the same time, this report has identified working methodological precedents for each half of the task that a harmonised approach would need to combine: rigorous historical and geospatial reconstruction of environmental change, of the kind demonstrated in the Kenya montane forest study, and rigorous monetary valuation of large-scale, structurally unequal resource transfers, of the kind demonstrated in the Hickel et al. unequal-exchange study. The absence of a harmonised methodology is therefore a gap that can be closed with existing analytical tools, not a fundamental barrier to quantification.

Taken together, these findings support a specific conclusion: the case for reparation for colonial ecological damage is real, is documented, has genuine legal precedent, and has, for the first time, a plausible institutional destination — but it cannot yet be quantified, and should not be presented as quantified, until the methodological work set out in the recommendations below has been undertaken.

# Recommendations and Way Forward

**1. Establishment of a multidisciplinary technical working group.** Concerned parties — governments, the African Union, relevant NGOs, and research institutions — should convene a team of experts drawn from Development Economics, Statistics, Accounting, Environmental Science, Engineering, and Estate Management, together with scholars in Geography and History and practitioners in International Law, with the explicit mandate of developing matrices and a framework for calculating the financial dimensions of ecological reparations claims. This report's five case studies — Nigeria, Ghana, Senegal, Uganda, and South Africa — should serve as the working group's initial test cases, precisely because they were compiled by different methods and can therefore be used to identify where methodological harmonisation is most needed.

**2. Adoption of a proportional/absolute framework.** Following the precedent set by existing cross-country environmental impact indices, the working group should from the outset distinguish between damage measured relative to each country's ecological resource base ("proportional" damage) and the total, absolute magnitude of degradation ("absolute" damage), and should be explicit at every stage about which of the two forms of measurement a given claim or comparison is based on.

**3. Adoption of best-practice assessment principles.** The working group should adapt, from prospective project-level environmental impact assessment to retrospective historical assessment, the internationally recognised Basic Principles of best-practice impact assessment: that the process be purposive, rigorous, credible, systematic, transparent, participative, and interdisciplinary, and that it be subject to independent verification.

**4. Adoption of a combined physical-and-monetary valuation methodology.** Following the precedent of the Kenya montane forest reconstruction and the Hickel et al. unequal-exchange study discussed above, the working group's methodology should proceed in two linked stages: first, the historically-anchored, archive- and remote-sensing-based reconstruction of physical environmental change attributable to specific, documented colonial policies, on a country-by-country and, where possible, region-by-region basis; and second, the translation of that physical record into a monetary valuation using established environmental input-output, footprint, or trade-accounting methods, consistent with the approaches already validated in the peer-reviewed literature.

**5. Timing to the African Union's 2025–2027 review cycle.** The working group's output should be developed with the explicit aim of informing the African Union's own ad hoc committee on the classification of ecocide, due to report in 2027, so that a harmonised methodology for measuring colonial ecological damage is available at the same moment the African Union is considering how such damage should be defined and treated in law.

**6. Continent-wide extension of the case-study approach.** Once a harmonised methodology is agreed, it should be applied systematically across the full set of African states that experienced colonial rule, rather than remaining confined to the five illustrative cases presented in this report.

**7. Integration with, not substitution for, existing reparations claims.** The resulting valuation of colonial ecological damage should be presented as an addition to existing reparations claims for direct colonial harm — the slave trade, colonisation, and the associated human costs already documented elsewhere — rather than as a replacement for them. The two categories of harm are complementary, not competing.

**8. Consideration of a state-to-state claims track alongside the AU harmonisation process.** The *Nauru v. Australia* precedent discussed in this report demonstrates that a claim built specifically and exclusively around unrehabilitated colonial-era environmental damage can be brought by a single state against a former colonial administrator, survive preliminary jurisdictional objections, and be resolved through negotiated settlement without requiring a specialised environmental-crimes tribunal that does not yet exist. Concerned governments should consider, in parallel with the AU-level harmonisation process recommended above, whether individual state-to-state claims — brought once the harmonised methodology has produced a defensible country-level evidentiary record — might proceed on a similar track, rather than waiting exclusively on developments at the International Criminal Court, whose suitability as a venue for ecocide prosecution remains contested among legal scholars.

**9. Vigilance against the re-emergence of colonial-style extraction within proposed remedies.** This report's Uganda case study documents that the same structure of colonial-era land and resource extraction — external capital acquiring long-term control of African land on terms the local population has little power to negotiate — has already recurred once, in the specific form of carbon-offset plantation schemes marketed as climate solutions. Any future climate, carbon-offset, or ecological-finance mechanism proposed as part of a remedy for colonial ecological

damage should be assessed against this risk directly, including through provisions guaranteeing that land-use rights, carbon-credit ownership, and the resulting revenue remain with the affected country and population rather than passing to external investors on long-term concessionary terms.

**10. Engagement with the emerging international climate finance architecture, and vigilance against its accounting failures.** As the working group's methodology matures, its findings should be brought into dialogue with the parallel international debate over climate finance for developing countries — including the ongoing effort, discussed at COP29 and since, to mobilise on the order of \$1 trillion per year in climate finance for developing countries by 2030. That debate has already established, at a diplomatic level, the principle that industrialised economies bear a financial responsibility for climate harms disproportionately borne by countries that contributed least to causing them; a harmonised accounting of colonial ecological damage would substantially strengthen the evidentiary basis for extending that principle backward, to the ecological damage colonial rule inflicted before the climate era as it is now understood began. At the same time, any resulting arrangement should learn from the documented failures of existing climate finance commitments: independent analysis of climate finance reported by wealthy countries between 2011 and 2020 found that 93 percent of it had simply been re-labelled from existing development-aid budgets rather than provided as genuinely new and additional finance, and that only 7 percent met the original 2009 commitment that climate finance be additional to prior aid commitments. A reparations or ecological-damage finance mechanism that permitted equivalent re-labelling — for example, by allowing existing aid, loan, or investment flows to be counted against a colonial ecological damage settlement — would replicate exactly the accounting failure that has undermined confidence in the existing climate finance system, and should be explicitly precluded in the design of any future mechanism.

#### BOX 4

##### The Climate Finance Comparison

International climate finance target discussed at COP29: **\$1 trillion per year** for developing countries by **2030**

This figure is already the subject of active, ongoing diplomatic negotiation among governments

Independent research (CARE International, "Seeing Double," 2023) found that **93%** of wealthy-country climate finance reported between 2011 and 2020 had been re-labelled from existing development aid rather than provided as new and additional finance; only **7%** met the original 2009 "new and additional" commitment

The \$1 trillion figure is offered as a scale comparison, not a like-for-like calculation: it shows that sums of this order are already treated as a legitimate subject of international negotiation. The 93% figure is offered as a cautionary precedent: any future colonial ecological damage finance mechanism must be explicitly designed to avoid the double-counting that has undermined the credibility of existing climate finance commitments.

The primary assignment of the technical working group recommended here is not to campaign, but to measure: to work out the matrices and framework for calculating the financial dimensions of ecological reparations claims, so that when the African Union and the international community are ready to act on this question, they are able to act on the basis of a number that will withstand scrutiny.

# Anticipated Objections

---

A report of this kind should anticipate the objections it will face, rather than leave them to be raised for the first time by a sceptical audience at the Round Table or by a respondent government years later. Four objections are foreseeable, and each is addressed briefly below.

**“Colonial-era conduct cannot be judged by present-day environmental standards.”** This objection — a version of the broader non-retroactivity principle in law — has real force where a claim depends on characterising conduct as criminal under a legal standard that did not exist at the time the conduct occurred. It has considerably less force against the kind of claim this report envisages, which is closer in structure to the Nauru precedent than to a criminal prosecution: a claim for the cost of rehabilitating specific, documented environmental damage, brought on the ground that the damage was foreseeable and avoidable by the standards of the time, not that it was already unlawful by the standards of the time. Colonial administrations were not ignorant of the ecological consequences of the policies documented in this report’s case studies; this report’s Nigeria case study quotes directly from an internal 1940s colonial report on land rehabilitation in the Plateau provinces that describes, in detail, the causal chain between colonial-era land-use change and the resulting soil erosion — evidence that the damage was recognised as such by the administering authorities contemporaneously, not merely identified retrospectively by modern environmental science.

**“Post-independence governments bear some responsibility for perpetuating these patterns, and this complicates attribution to the colonial power.”** This report’s own case studies do not dispute this; the Senegal case study explicitly notes that the immediate post-independence government continued, rather than reversed, the colonial groundnut monoculture model, and the Ghana case study notes that colonial-era mining and forestry concessions have, in some instances, been perpetuated or re-licensed by post-independence administrations. This is a genuine complication for attribution, not a reason to abandon the claim; it is precisely the kind of complication a rigorous, harmonised methodology — of the kind this report calls for — is designed to resolve, by distinguishing damage attributable to the initial colonial-era policy decision and infrastructure from damage attributable to subsequent, independent post-independence choices. The Kenya montane forest study discussed in the Methodology section demonstrates that this kind of attribution is technically achievable, by tracing damage to specific, dated infrastructure and administrative boundaries rather than treating “environmental degradation since 1900” as an undifferentiated whole.

**“The economic-history literature is divided on whether colonialism had a net negative effect on Africa at all.”** As discussed in the Introduction, this report does not need to resolve that debate, because it does not rest its claim on colonialism’s net economic effect. Whatever the net balance of colonial-era infrastructure investment against colonial-era extraction — the subject of ongoing dispute among economic historians [51, 52, 61] — the physical environmental record this report documents (forest cover collapse, oil spill volumes, land allocation shares, soil salinity) is a separate and independently measurable form of damage, and one that does not require taking a position on the wider, more contested question of colonialism’s aggregate economic legacy.

**“Quantifying damage of this age and diffuseness at continental scale is not technically feasible.”** This report’s Methodology section addresses this objection directly, by identifying working precedents for each half of the task a harmonised methodology would need to perform: historically-anchored physical reconstruction, of the kind demonstrated by the Kenya montane forest study, and monetary valuation of large-scale unequal resource transfers, of the kind demonstrated by Hickel et al.’s unequal-exchange study. Neither precedent required inventing a new analytical method from first principles; both applied established techniques — GIS-based historical reconstruction, and environmental input-output accounting — to a novel but tractable question. This report’s position is that the same is true of colonial ecological damage: the difficulty is one of coordinated application, not of missing analytical tools.

# Appendix 1: Summary Tables

Table A1. Summary of documented ecological damage categories by case study

| Country      | Colonial power          | Dominant extractive pattern                                                                                                 | Documented ecological consequences                                                                                                                            | Present-day expression                                                                                                                                               |
|--------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nigeria      | British                 | Tin/coal mining (Plateau, Enugu); cocoa, oil palm, rubber monoculture (South); crude oil (Niger Delta, late colonial)       | Deforestation, savanna overgrazing, soil erosion, mined-land abandonment, Niger Delta pollution precedent (Oloibiri)                                          | Loss of usable farmland; entrenched extraction-and-abandonment pattern in Niger Delta; est. 9-13 million barrels of oil spilled since 1958                           |
| Ghana        | British                 | Cocoa monoculture; gold mining                                                                                              | Deforestation (8.2M ha in 1900 to 1.5-2.7M ha today), soil degradation, cyclical cocoa boom-bust, mining-related contamination, "waste colonialism" (e-waste) | High climate vulnerability among cocoa farmers; Agbogbloshie e-waste site                                                                                            |
| Senegal      | French                  | Groundnut (peanut) monoculture                                                                                              | Deforestation of Groundnut Basin, soil erosion and exhaustion, salinisation, desertification                                                                  | 40% of cultivated land still under groundnuts vs. ~1% of world export share (from ~25% at independence); food import dependency; Great Green Wall restoration effort |
| Uganda       | British                 | Cotton/coffee export agriculture; land tenure disruption; exclusionary conservation; contemporary carbon-offset plantations | Soil degradation, deforestation, disrupted communal resource management; 1996-2000 Bukaleba plantation eviction of ~8,000 residents                           | Present-day land and resource-use conflicts; origin of the term "CO2lonialism"                                                                                       |
| South Africa | British/Dutch/Apartheid | Land expropriation (1913/1936 Land Acts); mining (Witwatersrand); commercial forestry; invasive species                     | Deforestation, acid mine drainage, biodiversity loss (fynbos to invasive wattle), land degradation in former "homelands"; land allocated 7-13% to             | Persistent land inequality, water stress, mining contamination; documented post-apartheid municipal water disconnections                                             |
|              |                         | introduction                                                                                                                | Black population (67% of population) vs. 87-93% to White population (21% of population)                                                                       | tied to homeland-era resettlement                                                                                                                                    |

Note: This table summarises qualitative and illustrative quantitative findings from the five case studies in this report and does not constitute an audited or harmonised quantitative estimate. A quantified version of this table, using harmonised metrics, is the primary deliverable recommended from the technical working group proposed in this report.

Table A2. Selected precedents for quantification of large-scale resource transfers and environmental damage, referenced in this report’s methodology

| Precedent                                   | Scope                                             | Method                                                              | Key figure(s)                                                                     |
|---------------------------------------------|---------------------------------------------------|---------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Bradshaw, Giam & Sodhi (2010)               | 228 countries, cross-sectional                    | Composite index from 7 harmonised environmental metrics             | Ranking sensitivity: Kendall's $\tau$ 0.70-0.92 depending on metric dropped       |
| Hickel, Dorninger, Wieland & Suwandi (2022) | Global North-South trade, 1990-2015               | Environmental input-output / footprint analysis                     | \$10.8 trillion/year (2015, Northern prices); \$242 trillion cumulative 1990-2015 |
| Gitau, Kinyanjui & Roberts (2025)           | Kenya montane forests, 1910-2024                  | Historical maps, archival records, satellite imagery, GIS           | Differential forest loss between colonial-settlement and native-settlement areas  |
| CARE International (2023)                   | Wealthy-country climate finance, 2011-2020        | Comparison of reported climate finance to development-aid baselines | 93% of reported climate finance was re-labelled development aid                   |
| Nauru v. Australia (ICJ, 1989-1993)         | Single-state claim, colonial-era phosphate mining | International litigation and negotiated settlement                  | Lump-sum plus annual payments tied to land rehabilitation                         |

*Note: Table A2 is included to document the methodological precedents this report draws on; it is not a proposal to adopt any one of these methods unmodified, but a demonstration that each component of a future harmonised methodology has a working precedent in the existing literature.*

**Table A3. Indicative roadmap for the recommended technical working group, aligned to the African Union's 2025-2027 ecocide review cycle**

| Period          | Milestone                                                                                                                                                                                  |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2026, H1        | Convening of multidisciplinary technical working group (Recommendation 1); adoption of proportional/absolute and best-practice assessment frameworks (Recommendations 2-3)                 |
| 2026, H2        | Pilot application of combined physical-and-monetary methodology (Recommendation 4) to this report's five case-study countries; publication of a harmonised, quantified version of Table A1 |
| 2027, Q1        | Submission of methodology and pilot findings to the African Union ad hoc committee on ecocide classification, ahead of its scheduled report                                                |
| 2027, H1        | AU ad hoc committee reports; African Union considers formal classification of ecocide (per the July 2025 AMCEN decision)                                                                   |
| 2027, H2 onward | Continent-wide extension of the methodology (Recommendation 6); consideration of state-to-state claims track alongside AU process (Recommendation 8)                                       |

*Note: this roadmap is indicative only and assumes the African Union's own 2027 reporting timeline, set out in the July 2025 AMCEN decision, is met. It should be revisited once the working group recommended in this report is convened.*

# References

1. Bernards, N. (2025). Exploitation, colonial capitalism, and the deep roots of climate vulnerability in West Africa. *New Political Economy*, 31(1), 72-87.
2. Friedman, R., Hirons, M.A., and Boyd, E. (2019). Vulnerability of Ghanaian women cocoa farmers to climate change: a typology. *Climate and Development*, 11(5), 446-458.
3. Odijie, M. (2019). Environmental change and normalization of cash crop systems in Africa: preventing agrarian change in West African cocoa. *International Journal of Sustainability and World Ecology*, 26(7), 597-611.
4. Schröth, G., et al. (2016). Vulnerability to climate change of cocoa in West Africa: patterns, opportunities, and limits to adaptation. *Science of the Total Environment*, 556, 231-241.
5. Kay, G.B. (1972), as cited in Bernards (2025) [see ref. 1].
6. Bedu-Addo, K., Ofori-Kuragu, M., and Apau, K.B. (2018). Incessant risk alarms associated with farming and consuming crops cultivated in host communities of gold mining operations in Ghana: truth, exaggeration, ignorance or mischief. *Journal of Toxicology and Risk Assessment*, 4:015.
7. Columbia Law School Climate Law Blog (2026). What can we hope for from the African advisory opinion on climate change: reimagining climate justice beyond 1.5°C.
8. Antipode (Wiley Online Library). <https://onlinelibrary.wiley.com/doi/10.1111/anti.12907>
9. Commonwealth Roundtable. The evolution of sustainability in Africa: from colonial exploitation to climate action. <https://www.commonwealthroundtable.co.uk/commonwealth/africa/research-article-the-evolution-of-sustainability-in-africa-from-colonial-exploitation-to-climate-action/>
10. The Conversation. Colonialism and climate risk are connected: evidence from Ghana and Senegal. <https://theconversation.com/colonialism-and-climate-risk-are-connected-evidence-from-ghana-and-senegal-263931>
11. Frontiers in Ecology and Evolution. <https://www.frontiersin.org/journals/ecology-and-evolution/articles/10.3389/fevo.2020.579813/full>
12. PubMed Central (PMC9634795). <https://pmc.ncbi.nlm.nih.gov/articles/PMC9634795/>
13. Jamba: Journal of Disaster Risk Studies. <https://jamba.org.za/index.php/jamba/article/view/1311/2449>
14. Brill journal article (bafr). [https://brill.com/view/journals/bafr/16/2/article-p177\\_4.pdf](https://brill.com/view/journals/bafr/16/2/article-p177_4.pdf)
15. ResearchGate. Map of South Africa showing the case study areas. [https://www.researchgate.net/figure/Map-of-South-Africa-showing-the-case-study-areas\\_fig1\\_228680255](https://www.researchgate.net/figure/Map-of-South-Africa-showing-the-case-study-areas_fig1_228680255)
16. Uniwriter.ai. Key political economy features of pre-colonial African societies. [note: not a peer-reviewed or editorially controlled source; recommend replacing with a scholarly reference] <https://www.uniwriter.ai/politics/what-are-the-key-political-economy-features-of-pre-colonial-african-societies>
17. ResearchGate. The impact of gold mining on the Witwatersrand on the rivers and karst system of Gauteng and North West Province, South Africa. [https://www.researchgate.net/publication/257588799\\_The\\_impact\\_of\\_gold\\_mining\\_on\\_the\\_Witwatersrand\\_on\\_the\\_rivers\\_and\\_karst\\_system\\_of\\_Gauteng\\_and\\_North\\_West\\_Province\\_South\\_Africa](https://www.researchgate.net/publication/257588799_The_impact_of_gold_mining_on_the_Witwatersrand_on_the_rivers_and_karst_system_of_Gauteng_and_North_West_Province_South_Africa)
18. MDPI. <https://www.mdpi.com/2075-163X/12/2/225>
19. ScienceDirect. <https://www.sciencedirect.com/science/article/pii/S0301479725008047>
20. Regime Shifts Database. Megadiverse fynbos shrublands to invasive wattle tree monoculture. <https://regimeshifts.org/item/611-megadiverse-fynbos-shrublands-to-invasive-wattle-tree-monoculture>
21. People and Nature (British Ecological Society / Wiley). <https://besjournals.onlinelibrary.wiley.com/doi/full/10.1002/pan3.10299>
22. Understanding and controlling alien vegetation in South Africa. <https://tomcatchippers.co.za/wp-content/uploads/2020/04/Understanding-and-controlling-alien-vegetation-in-South-Africa.pdf>
23. International Journal of Research and Innovation in Social Science. The effects of colonial environmental conservation policies on culture among the Sukuma of Shinyanga and Simiyu, Tanzania, 1920s-1950s. <https://rsisinternational.org/journals/ijriss/articles/the-effects-of-colonial-environmental-conservation-policies-on-culture-among-the-sukuma-of-shinyanga-and-simiyu-tanzania-1920s-1950s/>
24. Study.com. How globalization affects the environment. [note: instructional summary site, not a primary or scholarly source; recommend replacing] <https://study.com/academy/lesson/how-globalization-affects-the-environment.html>
25. Discover Magazine. 10 golden rules for reforestation. <https://www.discovermagazine.com/10-golden-rules-for-reforestation-show-how-to-plant-trees-the-right-way-42484>
26. Palmer, C.G. <https://www.riv.co.za/sasaqs/pdf/CGPalmer.pdf>
27. ScienceDirect. <https://www.sciencedirect.com/science/article/pii/S146290112600033X>
28. Africa Is a Country. Towards a working-class environmentalism for South Africa. <https://africasacountry.com/2019/10/towards-a-working-class-environmentalism-for-south-africa>



29. South African Government. Minister Barbara Creecy on climate change, 18 February 2020. <https://www.gov.za/news/media-statements/minister-barbara-creecy-climate-change-18-feb-2020>
30. ProQuest. <https://search.proquest.com/openview/85b4599838b7605c591172698e3db90f/1?pq-origsite=gscholar&cbl=5191094>
31. field journal, issue 12-13. Umhlaba: the world. <https://field-journal.com/issue-12-13/middle-east-africa/umhlaba-the-world/>
32. PreventionWeb. Local knowledge adds value: mapping flood risk in South Africa's informal settlements. <https://www.preventionweb.net/news/local-knowledge-adds-value-mapping-flood-risk-south-africas-informal-settlements>
33. United Nations Convention to Combat Desertification (UNCCD). South Africa Land Degradation Neutrality (LDN) Target Setting Programme Country Report. [https://www.unccd.int/sites/default/files/ldn\\_targets/South%20Africa%20LDN%20TSP%20Country%20Report.pdf](https://www.unccd.int/sites/default/files/ldn_targets/South%20Africa%20LDN%20TSP%20Country%20Report.pdf)
34. PubMed Central (PMC9959885). <https://pmc.ncbi.nlm.nih.gov/articles/PMC9959885/>
35. Climate Scorecard. Climate justice in South Africa. <https://www.climatescorecard.org/2022/03/climate-justice-in-south-africa/>
36. PubMed Central (PMC6164733). <https://pmc.ncbi.nlm.nih.gov/articles/PMC6164733/>
37. Cogent (Taylor & Francis). <https://www.tandfonline.com/doi/full/10.1080/23311932.2018.1504507>
38. Daily Maverick. Indigenous crops: local is not only lekker, it's also a weapon in the climate crisis battle. <https://www.dailymaverick.co.za/article/2021-07-01-indigenous-crops-local-is-not-only-lekker-its-also-a-weapon-in-the-climate-crisis-battle/>
39. Microsoft Encarta (2009). South Africa. Microsoft Corporation.
40. Bradshaw, C.J.A., Giam, X., and Sodhi, N.S. (2010). Evaluating the relative environmental impact of countries. *PLoS ONE*, 5(5), e10440.
41. International Association for Impact Assessment (IAIA), in cooperation with the Institute of Environmental Assessment (IEA), UK. (1999). Principles of Environmental Impact Assessment Best Practice. Fargo, ND: IAIA.
42. Ball, K. (2025). International Law on Ecocide and Extreme Environmental Harm. *K4DD Rapid Evidence Review* 298. Brighton: Institute of Development Studies.
43. Independent Expert Panel for the Legal Definition of Ecocide. (2021). Definition of ecocide. Stop Ecocide Foundation, as cited in Ball (2025) [ref. 43].
44. Council of Europe. (2025). Convention on the Protection of the Environment through Criminal Law, art. 31, as cited in Ball (2025) [ref. 43].
45. European Union. (2024). Directive (EU) 2024/1203 of the European Parliament and of the Council of 12 September 2024 on the protection of the environment through criminal law, art. 3(3), 12.
46. United Nations Environment Programme (UNEP). (2025). Africa's Environmental Priorities for the 2025-2027 Biennium.
47. Gillett, M. (2022). Prosecuting Environmental Harm before the International Criminal Court. Cambridge: Cambridge University Press.
48. Branch, A., and Minkova, L. (2023). Ecocide, the Anthropocene, and the International Criminal Court. *Ethics & International Affairs*, 37(1), 51-79.
49. Türk, V. (2024). HC Türk on recognising ecocide as an international crime. United Nations Office of the High Commissioner for Human Rights.
50. Acemoglu, D., and Robinson, J.A. (2017). The economic impact of colonialism. *VoxEU/CEPR*.
51. Michalopoulos, S., and Papaioannou, E. Extractive colonial economies and legacies of spatial inequality: evidence from Africa. *VoxEU/CEPR*.
52. Bernards, N. (2026). Colonialism and climate risk are connected: evidence from Ghana and Senegal. *The Conversation*.
53. World Rainforest Movement (WRM). (2004). Senegal: deforestation by expansion of groundnut monoculture.
54. Masse, D., et al., as cited in: Fallow land simulations to fight against soil degradation: engaging stakeholders with model exploration. *Journal of Artificial Societies and Social Simulation*.
55. Resilient Food Systems Programme. Land restoration reinvigorates Senegal's Groundnut Basin.
56. Grantham Research Institute on Climate Change and the Environment, LSE. New report recommends COP29 negotiations on climate finance should focus on mobilising \$1 trillion per year for developing countries by 2030.
57. CARE Climate Change. Double counted: climate finance means poorest pay the price.
58. World Economic Forum. (2026). Global Risks Report 2026: environmental risks remain urgent.
59. Gitau, P.N., Kinyanjui, R.N., and Roberts, P. (2025). Colonial infrastructure and montane forest loss in Kenya, 1910-2024. *Communications Earth & Environment*, 6, 728.
60. Kaniyathu, S.J. (2008). Evaluating the impact of colonialism on economic development: a counterfactual analysis. *Proceedings of the German Development Economics Conference, Zurich 2008*, No. 20. Verein für Socialpolitik, Research Committee Development Economics.
61. *Certain Phosphate Lands in Nauru (Nauru v. Australia)*, Preliminary Objections, Judgment, I.C.J. Reports 1992, p. 240. International Court of Justice.
62. Eraker, H. (2000). CO2lonialism: Norwegian Tree Plantations, Carbon Credits and Land Use Conflicts in Uganda. *NorWatch*, April 2000, as cited in World Rainforest Movement (2000) [ref. 64].
63. World Rainforest Movement (WRM). (2000). Uganda: carbon sinks and Norwegian CO2lonialism. *WRM Bulletin* 35, 18 June 2000.
64. Huni Kui, Chief N., Andreotti, V., and Stein, S. (2022). Views from COP27: how the climate conference could confront colonialism by centring Indigenous rights. *The Conversation*, 15 November 2022.



65. CARE International. (2023). Seeing Double: Decoding the Additionality of Climate Finance. CARE Climate Justice Center, 18 September 2023.
66. Tarantino, R. (2019). South African Water Rights and the Legacies of Apartheid. BSU Honors Program Theses and Projects, Item 402. Bridgewater State University.
67. Wood, L. (2015). The Environmental Impacts of Colonialism. BSU Honors Program Theses and Projects, Item 119. Bridgewater State University.
68. Gitau, P.N., Kinyanjui, R.N., and Roberts, P. (2025). Colonial infrastructure and montane forest loss in Kenya, 1910-2024. *Communications Earth & Environment*, 6, 728.
69. Kaniyathu, S.J. (2008). Evaluating the impact of colonialism on economic development: a counterfactual analysis. Proceedings of the German Development Economics Conference, Zurich 2008, No. 20. Verein für Socialpolitik, Research Committee Development Economics.
70. Certain Phosphate Lands in Nauru (Nauru v. Australia), Preliminary Objections, Judgment, I.C.J. Reports 1992, p. 240. International Court of Justice.
71. Eraker, H. (2000). CO2lonialism: Norwegian Tree Plantations, Carbon Credits and Land Use Conflicts in Uganda. NorWatch, April 2000, as cited in World Rainforest Movement (2000) [ref. 64].
72. World Rainforest Movement (WRM). (2000). Uganda: carbon sinks and Norwegian CO2lonialism. WRM Bulletin 35, 18 June 2000.
73. Huni Kui, Chief N., Andreotti, V., and Stein, S. (2022). Views from COP27: how the climate conference could confront colonialism by centring Indigenous rights. *The Conversation*, 15 November 2022.
74. Tarantino, R. (2019). South African Water Rights and the Legacies of Apartheid. BSU Honors Program Theses and Projects, Item 402. Bridgewater State University.
75. Wood, L. (2015). The Environmental Impacts of Colonialism. BSU Honors Program Theses and Projects, Item 119. Bridgewater State University.
76. Hickel, J., Dorninger, C., Wieland, H., and Suwandi, I. (2022). Imperialist appropriation in the world economy: drain from the global South through unequal exchange, 1990-2015. *Global Environmental Change*, 73, 102467.
77. Perchonock, N. (1997). The environment and market forces: the case of the Jos Plateau. In D. Okali, K.O. Ologe, and U.M. Igbozuruike (Eds.), *Perspectives in Environmental Management* (pp. 35–42). Ibadan: The Nigerian Environmental Study/Action Team (NEST).

---

# NOG KONZULTANTS

---

---

# UNIVERSITY OF LAGOS

---

Department of History & Strategic Studies, Akoka, Lagos · Agbor & Ejeme-  
Aniogor, Delta

[jonyekpe@unilag.edu.ng](mailto:jonyekpe@unilag.edu.ng) · +234 803 401 9418