How Shell is Using Nature-Based Solutions to Continue Its Fossil Fuel Agenda

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13 October 2022

milieudefensie
Friends of the Earth Netherlands

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the largest grassroots environmental network in the world.

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Acronyms

CAI	Climate Accountability Institute
CANP	Cordillera Azul National Park project (Peru)
CBD	Convention on Biological Diversity
CDM	Clean Development Mechanism
CDP	Carbon Disclosure Project
CEPKA	Ethnic Council of the Kichwa Peoples of the Amazon
CfRN	Coalition for Rainforest Nations
CIMA	Centro de Conservación, Investigación y Manejo de Áreas Naturales (Peru)
EC	The European Commission
EDF	Environmental Defense Fund
FPP	Forest Peoples Programme
GBF	Post-2020 Global Biodiversity Framework (of the CBD)
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GtC	Giga tonne of carbon, (1,000,000,000 tonnes)
IEA	International Energy Agency
INRENA	Instituto Nacional de Recursos Naturales (of the Government of Peru)
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
IPIECA	International Petroleum Industry Environmental Conservation Association
IUCN	International Union for the Conservation of Nature
KCP	Kasigau Corridor Project (Kenya)
KPP	Katingan Peatland Project (Indonesia)
NBS	Nature-based solutions
NCS	Natural climate solutions
NP	National Park
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SCF	Standing Committee on Finance (of the UNFCCC)
SCS	Scientific Certification Systems Inc.
SERNANP	Servicio Nacional de Areas Naturales Protegidas por el Estado (Peru)
SSNC	Swedish Society for Nature Conservation
TNC	The Nature Conservancy
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
VCMI	Voluntary Carbon Markets Integrity Initiative
VCS	Verified Carbon Standard
VER	Verified Emission Reduction
WBCSD	World Business Council on Sustainable Development
WWC	Wildlife Works Carbon
WWF	World Wide Fund for Nature

Executive Summary

The District Court of The Hague ordered Shell to reduce its net emissions by 45% by 2030. In its own Powering Progress strategy, Shell commits to becoming a 'net-zero' emission company by 2050. What appears like a big commitment to decarbonize is undermined by the three-letter word "net". A commitment to 'net-zero' means that Shell can continue to make a profit from burning oil, gas and coal **and** claim that this transfer of fossil carbon from underground deposits into the atmosphere will not contribute to global warming.

A concept called 'carbon offsetting' makes this illusion possible: Shell calculates the amount of fossil carbon released into the atmosphere as CO_2 from (a part of) its operations and buys an equivalent number of so-called carbon credits from projects elsewhere that somehow avoided emissions or took CO_2 out of the atmosphere. Central to the compensation claim is the requirement that these offset projects can be shown to have prevented emissions that would otherwise have been released, for example because electricity would have been produced from a coal-fired power plant had it not been for the offset project building a wind park. Or protecting forests that were at risk of being destroyed. Or planting trees that would not have been planted otherwise, and therefore CO_2 would not have been removed from the atmosphere.

The starting point for calculations that result in the issuance of carbon credits is thus always a hypothetical story of *what could have been*.

The risk of the 'net-zero' commitment accelerating runaway climate change is aggravated when companies rely on carbon credits from so-called 'nature-based solutions' projects – storage of carbon in soils, trees and other vegetation – to cancel out their fossil carbon emissions. Many climate scientists dismiss the potential of 'nature-based solutions' as a serious response to climate change, including because as offset projects, they cannot guarantee storage of carbon over the hundreds, let alone thousands of years that fossil carbon will interfere with the climate. Recent research also underscores major gaps in Western scientific knowledge that may materially affect the calculation of alleged additional carbon storage in trees. An article recently published in the academic journal Science shows that in "some dryland regions, the albedo warming effect of afforestation may strongly outweigh the cooling effect of carbon sequestration owing to the change from bright desert land to darker dense forest cover."[1] Existing tree planting offset projects fail to take into account the change in this so called "albedo effect" when trees are planted on bright surface areas such as open grasslands or dry shrublands, both areas that have been considered suitable in previous estimates of carbon storage potential through tree planting (see also Box: Scientific basis of NBS contested). The new research suggests that a reduced reflection of short-wave radiation (i.e. a reduced albedo effect) may outweigh any cooling effect through tree planting on about half the area identified in other studies.

The report *"How Shell is using nature-based solutions to continue its fossil fuel agenda"* describes three such offset projects which have supplied around 7.5 million carbon credits – more than four-fifths of Shell's known carbon credit purchases. They are the Cordillera Azul forest conservation project in Peru, the Kasigau Corridor Phase II project in Kenya and the Katingan REDD project in Indonesia. Our analysis shows that their claims that emission reductions are real and would not have occurred in the absence of the offset project are unconvincing. They rest on counterfactual and implausible assumptions about the level of emissions in the absence of these carbon offset projects. The assessment also finds selective application of standards and methodologies that project proponents claim to comply with. The case of the Cordillera Azul project in Peru, for example, shows that how a project accounts for the possibility that forest destruction is simply shifting from the project area elsewhere, can have a significant impact on calculated emissions that were allegedly avoided. Finally, our analysis of third-party "verification" documents reveals a lack of consistency and rigour. The combination of these factors has resulted in what appears to be greatly inflated volumes of allegedly avoided emissions in all three carbon offset projects assessed.

Consequently, net-zero claims based on the purchase of carbon credits from these projects lack plausibility. The projects fail to present a level of verifiable evidence that could be considered sufficient to justify the absolute claim that fossil carbon emissions which are real and verifiable, have been compensated.

Furthermore, several studies and reports, including the IPCC's 6th Assessment report,[2] have warned that offsetting plans through 'nature-based' carbon offset projects across the entire fossil fuel sector would likely require continent-scale areas of land. Key variables influencing the widely varying projections of the area of land required for corporate offsetting are the carbon density of the land within a project area and the overall estimated emissions to be compensated in future.

Such projections highlight that even if only a fraction of current corporate 'net-zero' emission pledges are pursued through the purchase of 'nature-based' carbon credits, they risk demanding vast areas of land, and causing significant levels of social disruption and conflict. This is because displacement of current land use – typically on land used for peasant and family farming rather than industrial use such as mining, industrial logging, agro-commodity production or large-scale cattle ranching – is at the core of 'nature-based' carbon offset projects.

1
Introduction

In 2021, Shell published its Powering Progress strategy, in which Shell commits to becoming a 'net-zero' emissions company by 2050. While it is unclear how Shell intends to achieve this, it is clear that the company intends to rely heavily on a concept called 'carbon offsetting'.

By 2030, Shell intends to offset 120 Mt in emissions a year, which represents about 85% of current annual CO_2-emissions of all citizens and companies in the Netherlands.

Carbon offsetting allows Shell to continue to profit from fossil carbon released into the atmosphere from oil and gas and, at the same time, claim that this transfer will not contribute to global warming. Shell calculates the amount of carbon dioxide (CO_2) released from (part of) its operations and buys an equivalent number of so-called carbon credits from projects elsewhere. Those projects need to show that, somehow, they avoid greenhouse gas emissions that, without the project intervention, would have been accumulating in the atmosphere. For example, because electricity would have been produced from a coal-fired power plant, had it not been for the offset project building a wind park. Or protecting forests that were at risk of being destroyed. Or planting trees that would not have been planted otherwise, and therefore CO_2 would not have been removed from the atmosphere.

Proponents claim that offsetting is an economically efficient means of preventing runaway climate change, because not all greenhouse gas emissions can be avoided or immediately reduced to zero. In reality, 'net-zero' emission commitments, in combination with 'carbon offsetting', delay the drastic reductions in greenhouse gas emissions that are needed to avert runaway climate change.

In its report 'Corporate Climate Responsibility Monitor 2022', the thinktank NewClimate Institute assessed the climate strategies of 25 major global companies and found that their 'net-zero' targets "aim to reduce the analysed companies' aggregate emissions by only 40% at most, not 100% as suggested by the term 'net-zero'."[3] Buying carbon credits is cheaper for companies than drastically reducing their own greenhouse gas emissions.

A similar gap between actual emission reductions under a 'net-zero' emissions target and reducing emissions to real zero is also evident in Shell's Powering Progress strategy. Shell has explained that it:

> *"has set a target to become a net-zero emissions energy business by 2050… We are transforming our business to meet our target: reducing emissions from our operations and providing more low-carbon energy, such as charging for electric vehicles, hydrogen and electricity generated by solar and wind power. We will also capture and store any remaining emissions using technology or balance them through nature-based projects. To help us do that, we buy carbon credits generated by projects that protect nature and restore the environment. We also invest directly in natural ecosystems to increase the supply of carbon credits and help meet growing demand from customers."*[4]

The District Court of The Hague judgement of May 2021 obliges Shell to reduce its emissions by net 45% by 2030. Shell argues in its statement of appeal to The Hague Court of Appeal that there is "no 'socially self-evident' obligation" to reduce emissions for companies (like itself) that "demonstrably take the energy transition very seriously".[5] As evidence of its voluntary intent "to achieve the global emissions reductions required", Shell notes that it "announced details of its own pathway to net-zero by 2050 in its Powering Progress strategy in February 2021".[6] It says that Powering Progress is "[c]entral to Shell's transformation to a net-zero company".[7]

'Nature-based' offsets – projects which typically either avoid release of carbon stored in trees or other vegetation like peat bogs or remove carbon through tree planting or restoration of soils or wetlands – are a key part of Shell's Powering Progress strategy.

This report assesses 'nature-based' offsets. It reviews the concept of 'nature-based solutions' (also sometimes referred to as 'natural climate solutions'), shows why the concept is flawed and why carbon credits from such projects cannot compensate for the climate impact of fossil carbon emissions released into the atmosphere. The report also describes Shell's involvement in projects that are marketed as 'nature-based solutions'. Three offset projects which have supplied the largest known quantities of Shell's carbon credit purchases are described in detail. They are the Cordillera Azul project in Peru, the Kasigau Corridor Phase II project in Kenya and the Katingan REDD project

in Indonesia. Our analysis shows that carbon credits generated from these projects rest on counterfactual, and thus ultimately unverifiable, assumptions about the level of emissions in the absence of the carbon offset projects. Several assumptions made by project proponents are implausible. The assessment also finds selective application of standards and methodologies that the project proponents claim to comply with. The example of the Cordillera Azul project, for example, shows that how a project accounts for the possibility that forest destruction is simply shifting from the project area to elsewhere, can have a significant impact on calculated emissions that were allegedly avoided. The combination of counterfactual assumptions, selective application of standards and methodologies and less-than rigorous audits has resulted in what appears to be greatly inflated volumes of allegedly avoided emissions in all three carbon offset projects assessed. Whether carbon credits bought from these projects plausibly represent emissions avoided or additional carbon stored is thus contested.

Several studies and reports, including the IPCC's 6th Assessment report,[8] have warned that offsetting plans through 'nature-based' carbon offset projects across the entire fossil fuel sector would likely require continent-scale areas of land. Projections of the area of land that would have to be managed in accordance with carbon offset demands of the global oil and gas industry vary widely. Key variables influencing such calculations are the carbon density of the land within a project area and the overall estimated emissions to be compensated in the future.

Such projections highlight that even if only a fraction of current corporate 'net-zero' emission pledges are pursued through the purchase of 'nature-based' carbon credits, they risk demanding vast areas of land, and causing significant levels of social disruption and conflict. This is because displacement of current land use – typically on land used for peasant and family farming rather than industrial use such as mining, industrial logging, agro-commodity production or large-scale cattle ranching – is at the core of many 'nature-based' carbon offset projects.

Corporate 'net-zero' land grab looming

Shell is not the only fossil fuel company that intends to offset at least some of its fossil carbon emissions through nature-based solutions. Indeed, several other corporations have already started doing so.

Italian oil company Eni originally stated the intent to establish 8.1 million hectares of plantations in Africa to offset its emissions and to purchase offsets to cover more than 20 million tonnes of carbon dioxide emissions per year by 2030,[9].[10] In 2021, the company bought carbon credits from two REDD projects in Zambia and a tree planting offset project in Tanzania.[11] One of the projects in Zambia covers nearly one million hectares of land.[12]

TotalEnergies recently acquired a 600,000 hectare logging concession in Gabon for the purpose of developing it as a source of carbon offsets,[13] and is already involved in development of a 40,000 hectare industrial plantation in the Republic of Congo for the same purpose.[14]

BP states that it is "championing" nature-based solutions; through a 2020 acquisition of Finite Carbon, it now has a majority interest in 50 carbon projects on around 1.2 million hectares (3 million acres) of forest land in the USA.[15] Amongst other projects from which BP has bought nature-based offsets is the 200,000 hectare scheme run by ProNatura in Mexico.[16]

Chevron and Norwegian state-owned Equinor say that nature-based offsets are a part of their aim to achieve 'net-zero' emissions by 2050[17] .[18]

Exxon's most recent 'progress report on climate solutions' says it intends to "employ emission offsets, which may include nature-based solutions".[19]

The oil industry's 'Environmental Conservation Association' (IPIECA) says in its strategy for 2021-2024 that "We will explore the key enablers of pathways to a net-zero future such as Scope 1, 2 and 3 emissions and nature-based solutions".[20]

2

Nature-based solutions: a concept based on shaky grounds risks triggering a massive land grab in the global South

The concept of 'nature-based solutions' (NBS) has been around for about 13 years. It is used as a label for both climate mitigation *and* adaptation activities. In this report, we use it exclusively in relation to the former. Typically, NBS refers to one of two types of activities. Projects involving tree-planting or restoring ecosystems such as peat-bogs or mangroves take up and store additional carbon, while projects protecting existing forests at risk from destruction claim to prevent the release of additional carbon into the atmosphere.

'Nature-based solutions' (and the similar and often interchangeably used term 'natural climate solutions', NCS) first appeared in December 2009, in the run-up to the 15th UN climate conference in Copenhagen. But NBS only really gained international interest from 2017 onwards, especially with the publication of a paper claiming that the concept could help mitigate up to 37 percent of climate warming by 2030.[21]

The claim has been widely repeated by decision-makers, international agencies and business interests. It gave credibility to the concept but has not been supported by independent scientific assessments,[22] and its assumptions have been called into question.[23] Many climate scientists dismiss the potential impact of 'natural solutions' as a serious response to climate change and warn of its side-effects.[24]

2.1
• What and who is behind NBS?

In a position paper entitled "*No time to lose – make full use of nature-based solutions in the post-2012 climate change regime*",[25] which was released for the 15th UN climate conference in Copenhagen in 2009, the International Union for the Conservation of Nature (IUCN) stated that it "is *promoting nature-based solutions to climate change as an integral part of broader adaptation and mitigation plans and strategies. REDD-plus is a rapidly implementable mitigation option*". The term was thus closely associated with the (controversial) concept of Reducing Emissions from Deforestation and Degradation (REDD+).

From the outset, forest protection schemes had been excluded from the main carbon trading instrument of the first international treaty mandating industrialised countries to reduce their greenhouse gas emissions: the Kyoto Protocol's Clean Development Mechanism (CDM).[26] Following this decision, REDD+ was promoted with the intention to open carbon markets to forest conservation projects, regardless of the decision at the UN climate conference. While afforestation and reforestation projects were eligible under the CDM, the validity of carbon credits from these tree planting projects was limited to between seven years and several decades. After this time, carbon credits from these projects had to be replaced with credits from other offset projects such as wind farms that were considered to deliver permanent emission reductions.[27]

At the 2016 IUCN World Conservation Congress, a resolution was passed defining NBS as:

> *"Actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits".*[28]

The vague definition could encompass the kinds of activities that would help generate widespread support for the concept, such as restoration of wetlands or forests, as well as the large-scale 'fortress' conservation and industrial tree plantation projects that would be needed to provide the volumes of carbon credits demanded by the industry.

As the prospect of much larger flows of (mostly private sector) funding into 'nature' increasingly drew conservation groups into NBS, so a problem emerged: the lack of scientific underpinning for, or acceptance of, the concept. As a spokesperson for The Nature Conservancy (TNC) put it in a 2015 video on NCS, "*We've got to get the science for natural climate solutions really watertight so that we can demonstrate to politicians, to corporates, that this is a serious sector*".[29] Filling this gap, and a significant boost for the concept, was the publication in October 2017 of the paper 'Natural Climate Solutions', led by then TNC Chief Scientist, Bronson Griscom (see below).[30] The central claim made in this paper, that NBS/NCS could mitigate 37% of climate change by 2030, was repeated by many decision-makers, national and international agencies and organisations. It thus gave the term a licence of credibility – despite the paper's seriously flawed methodologies and highly implausible conclusions (see Box – Scientific basis of NBS contested).

Inevitably, as TNC had explicitly intended, 'natural climate solutions' became a mechanism "*where credits can be offered to businesses that are facing steeper costs to abate emissions in other ways*"[39] – in other words, a cheap way for companies to avoid actual reductions in fossil fuel production and consumption. Shell's 2019 announcement of a US$300 million investment in "nature as part of a broad drive to tackle CO_2 emissions" featured a long quote from TNC's CEO at the time, Mark Tercek alongside that of Shell CEO, Ben van Beurden.[40]

Scientific basis of NBS contested

The widely cited and criticized Griscom paper of 2017 claims that NBS "can provide 37% of cost-effective CO_2 mitigation needed through 2030 for a >66% chance of holding warming to below 2° C".[31] As it has been so influential, it is relevant to assess what this paper actually tells us about the real potential of NBS.

While widely presented as being based on scientific data, the Griscom paper merely sets out hypothetical calculations for potential additional carbon absorption by 'nature'. The simplistic top-line message conceals a vast array of assumptions, some of them highly implausible, buried within the paper's technical annex. For example, roughly half of the claimed mitigation potential comes from afforestation – tree planting on land that was not covered in trees in recent memory – or reforestation, where the land was covered in trees sometime in the previous 50 years, but was then deforested.[32] The land required for this would be nearly 700 million hectares, or roughly the size of Australia, most of it evidently in the global South. The political, economic, social and logistical challenges of such a continental-scale change in land use are entirely ignored in the paper. A publication on the 'ecological limits' of biological carbon dioxide removals points not only to the land required for mass afforestation, but also the significant inputs of nitrogen and phosphorus[33] – and the ecological side-effects of such mass-application of fertilizer. Research presented in September 2022 in the academic journal Science casts further doubt on the claims and underscores major gaps in Western scientific knowledge that may materially affect the calculation of alleged additional carbon storage in trees. The researchers show that in "some dryland regions, the albedo warming effect of afforestation may strongly outweigh the cooling effect of carbon sequestration owing to the change from bright desert land to darker dense forest cover."[34] Existing tree planting offset projects fail to take into account the change in this so called "albedo effect" when trees are planted on bright surface areas such as open grasslands or dry shrublands, both areas that have been considered suitable in previous estimates of carbon storage potential through tree planting. The new research suggests that a reduced reflection of short-wave radiation (i.e. a reduced albedo effect) may outweigh any cooling effect through tree planting on about half the area identified in publications such as the Griscom paper.

A wealth of scientific literature has been published cautioning against excessive hopes for tree planting as a part of climate mitigation policy.[35] A paper published in July 2022 found that "responsible" removals of carbon through nature restoration projects or 'land removals' "cannot be scaled up quickly enough to noticeably reduce peak global temperatures".[36] Removal of 103GtC by such means through to 2100 would only reduce the increase in global temperatures by 0.10°C, the study found. It is clear that even the commencement of implementation at scale is unlikely before 2030. At current levels of emissions, the carbon budget available for a 50% chance to limit global temperature rise to 1.5°C will have been exhausted by 2032. Several ecosystems and biomes such as the Amazon or parts of the Tundra are already losing their capacity to absorb carbon,[37] and as climate change worsens and negative feedback loops intensify, their mitigation potential will continue to shrink or reverse, and they turn from carbon sinks into carbon emitters.[38]

2.2

• No formal recognition of NBS in climate and biodiversity policy (yet)

Despite the efforts of TNC and others, and the uptake of NBS by dozens of large polluters and bodies such as the World Business Council on Sustainable Development,[41] the concept of NBS has not yet become a part of formal policy discussions at the UN climate conference (UNFCCC). In October 2021, the UNFCCC's Standing Committee on Finance undertook the first part of an informal discussion on NBS, to be completed in 2022, but has not reported either to the Committee or the Conferenced of Parties.[42]

Whilst the term 'nature-based solutions' has not yet entered into the mainstream of UNFCCC's deliberations, it was included in the IPCC report in 2018 on Climate Change and Land, which is sometimes used as evidence of support for NBS.[43] Some of the relevant key findings of this are considered below in Section 2.3. It also then figured substantially in the IPCC's 2022 sixth Assessment Report ('AR6').

Referring to the group of issues known hitherto in climate science as 'Agriculture, Forestry and Other Land Uses' (which embraces most of what are now known as NBS 'pathways'), the report says:

"If [such] measures are deployed badly then, when taken together with the increasing need to produce sufficient food, feed, fuel and wood, they may exacerbate trade-offs with the conservation of habitats, adaptation, biodiversity and other services. At the same time the capacity of the land to support these functions may be threatened by climate change itself (high confidence)."[44]

"The economic and political feasibility of implementing [such] mitigation measures is hampered by persistent barriers."[45]

In 2021, the IPCC and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES, which is a kind of biodiversity-related equivalent of IPCC) conducted a joint science workshop on 'Biodiversity and Climate Change', including specifically on NBS. The report of the workshop did not even mention the 37% mitigation claim, and instead found that:

> *"Nature-based solutions can play an important role in climate mitigation, but the extent is debated, and they can only be effective with ambitious reductions in all human-caused greenhouse gas emissions. Estimates of potential contributions of nature-based solutions to climate mitigation vary widely and some proposed actions such as large-scale afforestation or bioenergy plantations may violate an important tenet of nature-based solutions – namely that they should simultaneously provide human well-being and biodiversity benefits."*

> *The report further reiterated that the very term 'nature-based solutions' "is not universally accepted in international policy…and that scientists have expressed concern about its use, among other reasons, because the term is sometimes used to refer to measures that have negative impacts on biodiversity and good quality of life."*[46]

2.3
• Landgrabbing, North-South inequity

Even the most carbon-dense 'natural' means of storing carbon which have the potential for significant scaling-up (protection of peatlands and forests and establishing tree plantations on large scale) would require not only very extensive programmes but also lead to extension and strengthening of corporate and state control of (forest) land.

Because of their nature, such projects would tend to be in the global South, where:

- tree growth is more rapid;
- land is cheapest;
- environmental and human rights legislation is weakest or most easily circumvented;
- existing land tenure is weakest or least secure, and;
- land is already cleared or modified by humans and could be dismissed as 'degraded'.

Taken together, such projects could pose a significant threat to existing land use patterns in countries in the global South, especially to subsistence agriculture and traditional 'forest farming', where all of the above characteristics are likely to be found. Many large NBS projects are being developed in countries in Africa – including the Republic of Congo, Gabon, Uganda, Kenya, and Zambia – typically on land used by subsistence farmers or pastoralists. Governments are likely to favour the location of such projects on lands occupied by peoples that are marginalized or do not share the national vision of 'development'.

Afforestation alone at the kind of scale being projected by pro-NBS advocates could potentially affect hundreds of millions of people – causing shortages of land available for subsistence agriculture, displacements and threatening food sovereignty and negatively impacting biodiversity and watersheds that people depend on. The IPCC's 2018 paper on Climate Change and Land indicates that, at a scale of 10.1 Gt/y removal of CO_2 (very close to the figure in the Griscom paper), through reforestation and forest restoration ("partly overlapping with afforestation"), large-scale afforestation "*could cause increases in food prices of 80% by 2050, and more general mitigation measures in the Agriculture, Forests and Other Landuses sector can translate into a rise in undernourishment of 80–300 million people; the impact of reforestation is lower*".[47]

IPCC's AR6 notes that

> *"[i]f [nature-based] measures are deployed badly then, when taken together with the increasing need to produce sufficient food, feed, fuel and wood, they may exacerbate trade-offs with the conservation of habitats, adaptation, biodiversity and other services. At the same time, the capacity of the land to support these functions may be threatened by climate change itself".*[48]

Similar concerns can also apply to NBS activities involving agricultural practises, the next largest group of NBS 'mitigation pathways'.[49] Some proponents of NBS believe that the removal of vast areas of land from peasant agriculture and family farming, and restoring of carbon levels

in agricultural soils is possible through 'sustainable intensification' of farming. However, 'carbon farming' is based on even more contested science than tree planting as a form of NBS.[50] Development charities such as ActionAid say that soil carbon capture is unlikely to benefit smallholders.[51] It can conflict with human rights such as the right to food, or the rights of indigenous peoples and rural populations, as set out respectively in the United Nations Declaration on the Rights of Peasants (UNDROP) and the UN Declaration on the Rights of Indigenous Peoples (UNDRIP).[52]

2.4
• Biodiversity/ecosystem damage due to e.g. monoculture tree plantations

The allegedly fastest 'nature-based solution' of sequestering and storing carbon is the setting up of fast-growing plantations of trees in the tropics, especially of species such as eucalyptus and acacia. Such industrial tree plantations are already being favoured as carbon offsets, including by oil companies.[53] But the environmental, ecological and social problems associated with such monoculture tree plantations are numerous, and well documented: clearance and destruction of native habitats and biodiversity, including existing forest and natural grasslands; creation of extremely impoverished habitats; reliance on large volumes of pesticides; depletion of ground and surface water leading to destruction of farming, displacement and rural depopulation; theft and concentrated ownership of land; exhaustion of soils, and; susceptibility to fire.[54]

As the report of Working Group II for the IPCC AR6 notes:

> *"When plantations are established without effective landscape planning and meaningful engagement including free prior and informed consent, they can present risks to biodiversity and the rights, well-being and livelihoods of Indigenous and local communities, as well as being less climate-resilient than natural forests (very high confidence)".*[55]

It further notes that:

> *"Afforesting areas such as savannahs and many temperate peatlands, which would not naturally be forested, damages biodiversity and increase vulnerability to climate change (high confidence)".*[56]

3

NBS a key pillar of Shell's Powering Progress strategy

"We invest in nature-based solutions (NBS) projects which protect, transform and restore land... We support the responsible use of high-quality nature-based carbon credits".[57]

Shell 'Nature-based solutions' website

3.1
• Background

Shell had set out some of what became the 'nature' elements of its 'Powering Progress' strategy already in 2019, with the announcement that it intended to "*invest in nature as part of broad drive to tackle CO_2 emissions*".[58] This announcement included reference to specific projects from which Shell would buy carbon offsets:

> *"CO_2 emissions generated by participating motorists – as well as from the extraction, refining and distribution of the fuel – will be offset by carbon credits. As one of the most established traders of carbon credits in the world, Shell buys these credits from a global portfolio of nature-based projects, including Cordillera Azul National Park Project in Peru, Katingan Peatland Restoration and Conservation Project in Indonesia and GreenTrees Reforestation Project in the USA."*[59]

In 2021, Shell announced that it "*aims to use nature-based solutions… to offset emissions of around 120 million tonnes a year by 2030*".[60] According to a July 2022 report, on the announcement of a US$40 million investment in Carbonnext – Brazil's largest offset project developer – the country would play an important role in supplying nature-based offsets to Shell. Shell Brazil's president Andre Araujo stated that:

> *"Brazil, due to its location and biodiversity, is fundamental to our Powering Progress strategy, especially when we talk about respecting nature and boosting lives, in addition to achieving net-zero emissions and generating value for shareholders…"*[61]

3.2
• Which NBS projects has Shell bought carbon credits from?

As of August 2022, Shell is or had been involved in 30 'nature-based' offset projects, in 17 countries[62] (see Annex 1). Usually this involvement is only indirect, in that Shell buys carbon credits, either directly from the project owner, or from a carbon broker. More recently, Shell has also invested directly in seven projects that are being developed to generate carbon credits. These have not yet been verified under a recognised system (such as the standards administered by the two main standard organisations in the carbon offset market, Verra and the Gold Standard). These projects have thus not yet supplied any carbon credits to Shell. Theoretically, projects can generate carbon credits without a third-party audit. In fact, the methodologies used by the dominant carbon standard organisation, Verra, have largely been developed by project owners and were then adopted by Verra. In reality, however, projects would have difficulty selling carbon credits without such an external audit.

The projects from which Shell has bought carbon credits can be divided into two main types:

- **Carbon offset projects, mostly concerned with 'protection' or restoration of lands that have been classified as 'natural'** and which are located mostly in the global South. These account for around half of all the projects, but provide the vast majority of the carbon credits Shell has purchased.

- **Afforestation projects in China**. Shell lists eight such projects, all of which appear to be third-party projects. These are generally smaller in size and have been the source of a smaller number of carbon credits.

Together, the known area covered by these projects is just over three million hectares, or about three-quarters the size of the Netherlands (noting that all of the projects currently supplying Shell with carbon credits also supply other companies with carbon credits). A total of 9.1 million carbon credit purchases by Shell have been identified by the authors of this report through the registry maintained by Verra. More than four-fifths of the known carbon credit purchases (around 7.5 million, with each **carbon credit** representing an equivalent of 1 tonne of carbon dioxide (CO_2) in emissions allegedly avoided) originated from just three projects. These three projects, the Cordillera Azul National Park Project in Peru, the Katingan Peatland Project in Indonesia, and the Kasigau Corridor II Project in Kenya, are assessed in more detail in chapter 5.

The specific purpose of the credits purchased by Shell is mostly not stated in the Verra registry, but details are provided for some. For example, Shell used 206,180 carbon credits to "[o]*ffset emissions related to the LNG cargo number LN21J96NSH25 by Shell to CPC Corporation, Taiwan*". All the carbon credits for the compensation of this fossil gas shipment were purchased from the Katingan Project in Indonesia.[63]

3.3
• Old carbon credits used to claim compensation of new emissions

Because carbon credits do not lose their validity once issued, companies often use carbon credits representing emissions that were (allegedly) avoided years ago. To save on costs, project owners may also not apply for verification of emission savings on a yearly basis, but delay this verification audit and then request issuance of credits going back several years. The start of a project is also typically dated (much) earlier than the project validation date and the date of the first verification against the carbon standard of its choosing (see Annex 2 for a description of the different stages of the offset project development and auditing process). Consequently, the first verification of a project and the subsequent issuance of the first batch of carbon credits usually cover alleged emissions avoided during several years in the past.

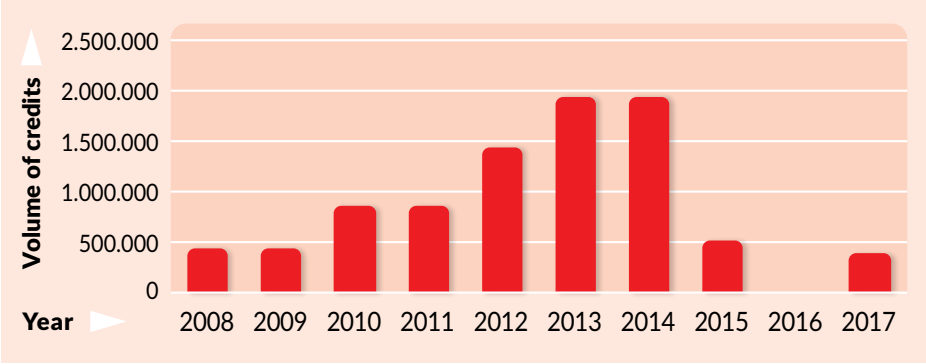


Figure 1:
Year of alleged emissions reductions of carbon credits bought by Shell

The start date for the Cordillera Azul project in Peru, for example, is given as 2008. Yet, the project passed through its first verification by external auditors only in 2013, and was first issued carbon credits in July 2015.[64] Some of the carbon credits issued in 2015 will thus represent emissions allegedly avoided seven years previously, in 2008.

A company like Shell may also make bulk purchases of carbon credits from a particular project and negotiate a discount for buying many credits at once and then only use them to cancel out emissions at a later stage.

Older carbon credits are typically cheaper than newer ones. The price bargain goes hand-in-hand with a burden for the climate: How can an alleged reduction dating back several years cancel out the climate impact of the additional emissions today?

The vast majority of carbon credits which Shell has bought from its six largest sources since 2014 (roughly 96% of all known carbon credits bought by Shell) represent alleged emisson reductions that took place eight or more years ago. Some alleged emisson reductions may date back as far as 2008 (see Figure 1). More than a quarter of the carbon credits refer to emissions that may have been avoided (if they were avoided) more than ten years ago. Less than five percent of the carbon credits used by Shell represent alleged emisson reductions that took place as recently as 2017 (and none were more recent than that). This includes even the large amount of carbon credits Shell purchased in 2019.

In other words, since 2019, Shell has been claiming to offer net-zero fuels in the present, even though the supposedly avoided emissions against which emissions from these fuels are being 'offset' could have occurred a decade or more ago.

3.4
• High integrity carbon credits – an inherent contradiction?

Shell has stated that the offsets it buys will be of "the highest independently verified quality".[65] However, the quality bar is (currently) set very low. A steady flow of reports and investigations has exposed fraudulent offset schemes, carbon credits that are unlikely to represent additional emission savings and implausible project assumptions that inflate – often significantly – carbon credit volumes.[66] Rating agencies such as BeZero have been rating even verified NBS projects with 'low quality' scores. This includes projects verified in accordance with methodologies managed by the not-for-profit organisation Verra, the dominant standard setting organisation for NBS offset projects. Verra claims to have verified more than 1,800 offset projects and to have issued 968 million carbon credits (or, in its terms, Verified Carbon Unit, VCUs), equivalent to about six years' worth of emissions from the Netherlands. One such example is the Tambopata Brazil Nut Concession project in Peru (see p. 7 / footnote 12). In May 2022, it was awarded the lowest possible BeZero rating, "A", indicating that "*the credit issued by the project has a low likelihood of achieving 1 tonne of CO_2e avoidance or removal*".[67] Shell has bought carbon credits from several projects that have been audited for compliance with Verra-approved methodologies.

Currently, several initiatives are underway with the expressed goal of improving the "integrity" of credits issued by NBS offset projects.[68] These initiatives are as voluntary as the market they are concerned with. An Open NGO Letter calls "attention to critical failures of integrity" within one of these, the Voluntary Carbon Markets Integrity Initiative.[69] These initiatives evidently will fail to address the core weakness of carbon offsetting (see chapter 4): The necessity to quantify and verify a counterfactual story of the volume of emissions that without the offset project would have additionally been accumulating in the atmosphere.

4

Why NBS cannot cancel out the climate impact of fossil carbon emissions

It is sometimes argued that NBS could comprise activities that do not generate carbon offsets. There are certainly programmes using the name which are essentially typical development or conservation projects, many rebranded for fundraising purposes. However, the impetus for the concept of NBS was always closely associated with 'carbon offsetting' and the generation of tradeable carbon credits. This is also specifically how Shell refers to NBS in its strategy. Hence, the following section considers the flaws of NBS *as offsets*.

The claim that the climate impact from fossil carbon emissions has been offset through the purchase of carbon credits is untenable for several reasons. These fall into two categories. First, there is a conceptual flaw at the heart of offsetting: calculations that determine the volume of carbon credits generated by an offset project take their origin in a hypothetical story of *what could have been*. They are therefore, ultimately, unverifiable. Second, NBS projects are particularly susceptible to manipulation and inflated emission reduction claims due to methodological and structural aspects of the project development and auditing processes.

Before looking at the case studies in chapter 5, it can be helpful to read through the present chapter that explains, in brief, the key shortcomings that afflict carbon offset projects.[70] Chapter 4.1 outlines the two dimensions of the conceptual flaw of offsetting being reliant on verifying unverifiable, counterfactual project assumptions that determine the volume of carbon credits issued by a carbon offset project. It also points to the time-scale mismatch that makes storage over comparatively short periods of time (decades to centuries) unsuitable as compensation for fossil carbon emissions that will interfere with the climate for thousands of years. Chapter 4.2 addresses the methodological loophole of how projects calculate the risk of forest destruction by simply shifting to elsewhere, a phenomenon described as 'leakage' (4.2.2). It also highlights structural loopholes that favour exaggeration of allegedly avoided emissions and are based on miscalculating, understating, or ignoring, actual emissions from a project (4.2.3). Chapter 4.2.4 outlines why existing NBS offset standard systems lack a convincing insurance mechanism to make up for unexpected release of carbon stored in trees.

Time-scale mismatch

Beyond conceptual and methodological flaws of offsetting, carbon credits from NBS projects are unsuitable as compensation for fossil carbon emissions for another reason: carbon storage through NBS projects is reversible at any time and project developers cannot guarantee carbon storage over the long period of time that fossil carbon, once released, will interfere with the climate.

While carbon released through fossil fuel burning is partly absorbed in living organic matter, a portion of it remains in the atmosphere for thousands of years.[71] The carbon within biological cycles, on the other hand, will only remain out of the atmosphere for a matter of days to centuries. This means that carbon that was locked away from interference with the climate for millions of years will carry on increasing atmospheric carbon dioxide levels in absolute terms if it is released from geological deposits underground, even if some of this fossil carbon will be temporarily stored in vegetation. In the context of carbon offsetting, this time-scale mismatch is reduced to an issue of 'impermanence' of carbon storage in vegetation.

Moreover, because of climate change as such, forests are losing their ability to retain the current levels of carbon they store and are becoming net sources of greenhouse gas emissions (especially through catastrophic forest fires as we have witnessed in recent years from California to Portugal and Spain).[72]

4.1
• Carbon credits are based on quantifying something that did not happen – twice

There is an inherent problem of **quantifying and verifying something that did not happen**, such as deforestation that was said would happen in the (near) future, or proving that the construction of a wind park replaces (rather than just adds to) electricity generated by a coal-fired power plant. Yet, that is what offsetting requires. As one observer has put it, carbon offsets "are an imaginary commodity created by deducting what you hope happens from what you guess would have happened".[73]

Offset projects involve not one but two calculations that are based on the project developer's guess of what would have happened. First, a project proponent needs to show that without the income from the sale of carbon credits, the project activity would not have taken place: a wind park would not have been built, trees would not have been planted, forest destruction would not have been prevented. This is known as proving "additionality" in carbon offset jargon. Often, carbon offset methodologies will use economic analyses as a proxy for proof of additionality of an offset project. For example, whether the funding for the project derived from the sale of carbon credits was absolutely essential to the project taking place. Increasingly, and in recognition of the impossibility to verify the project proponent's additionality claims, this principle of additionality is misrepresented as being about whether an offset project generates *additional* funding, which would mean that all offset projects are inherently additional so long as they generate income from sale of carbon credits. Another common proxy to claim additionality in nature-based projects is the claim that the project increases the level of legal protection of the forests or other habitat.

Second, the project proponent needs to calculate how much carbon would have been released into the atmosphere in the absence of the offset project, or how much carbon would not have been removed from the atmosphere had the project not planted trees, for example. This is called the 'baseline'. The volume of carbon credits issued by an offset project that claims to prevent deforestation is essentially the projected, hypothetical baseline emissions minus the actual emissions. If the project generates carbon credits from removing CO_2 from the atmosphere, through tree planting for example, then the volume of credits represents the actual storage of carbon in the trees, or in the soil minus the carbon that was already stored in vegetation already growing on the land, and in the soil.

There are many ways of creating a counterfactual baseline. For example, an area of forest is said to be threatened by a growing local population using land for farming. The baseline emissions for the area would thus be calculated as a function of population growth and resulting deforestation. If the projected future annual population growth rate is simply 'adjusted' upwards a few percent from what it actually is, then the hypothetical future deforestation will be commensurately (and increasingly) higher over the life of the project. The actual emissions under the project will thus be *relatively* lower (by an increasingly large amount), generating many more credits than would have been the case if a lower and more plausible population growth

rate had been used as baseline. If the baseline is inflated sufficiently, then the project area can even experience significantly *increased* deforestation and related emissions in real terms – but still claim 'reductions' against this implausible hypothetical baseline. An example of this would be where a project claims that, without its intervention, an area of forest currently being destroyed at 1% per year would in future have been destroyed at a rate of, say, 5% per year. If the area is subsequently destroyed at 'only' 3% per year, then the difference in emissions between the actual 3% deforestation and the counterfactual 5% can be claimed as 'avoided emission' credits (even though absolute emissions from deforestation trebled).

In another frequently used ploy, the inflation of a project baseline occurs through the choice or use of a **'reference area' that cannot be plausibly assumed to be a genuine reference for the project site**. The reference area is a location whose *past* (or even projected *future*) is taken to represent what might happen to the project area in the future if the carbon offset project did not occur. An area that already has lost most of its forest, for example, of which it is assumed that the same rate of forest loss would occur in the project area without project intervention. If the project is a tree planting project, the reference area could be an area that has similar conditions as the project but where no trees have been planted. Identification of a suitable reference area is required for most Verra-verified NBS-type offset projects. Broadly speaking, the rate of carbon emissions occurring in the reference area is then mapped on to the project area to create the project's baseline scenario. Supposedly, the reference area should be very comparable to the project area in terms of showing the actual causes of carbon emissions

that are believed would occur in the project area, as well as the socio-economic conditions pertaining there. Often, however, the reference area is actually very different from the project area – for example, being more accessible, more populated, more attractive to loggers or farmers, suffering from unusually high rates of deforestation, etc. This then leads to overstatement of the destruction that would occur in the project area, hence a higher baseline, and hence issuance of more carbon credits.

A further possible manipulation designed to increase the baselines and hence the volume of issuable credits is in the choice of the **reference period**. This is the period for assessing what carbon-emitting activities happened within the reference area. If, for example, a historical period is chosen when deforestation was, for whatever reason, particularly high, then this would also feed through into creating a higher baseline, because projects then project the past deforestation rate into the future (hence helping to generate more credits).

Whilst it is incredibly easy for projects to make these kind of credit-boosting falsifications, they can be hard to detect – being buried deep in the lengthy and complex documents and formulae used to calculate the volume of credits supposedly generated. Above all, however, even if detected, it may be possible to show that the assumption of the assumed hypothetical baseline chosen by the project proponent, say 5% annual deforestation, is highly implausible, and the figure highly unlikely – but it is impossible to prove categorically that this *would not* have happened, because the project has already taken place. It *also* means that it is not possible for the project proponent to 'prove' in a verifiable manner that the alleged volume of emissions would have been released, and thus that the claimed volume of emissions has indeed been avoided.

> *It is important to underscore that what is presented as "verification" of the counterfactual baseline in the auditing of carbon offset projects is merely an assessment of plausibility of the project proponent's quantified story of what might have happened on the land without the offset project intervention.*

Furthermore, the inherent moral hazard with counterfactual baselines is that the higher the projected future baseline emissions, the greater will be the 'reductions' that can be shown as a result of implementing the carbon offset project. In other words, the higher the hypothetical baseline emissions, the more carbon credits an offset project can sell.

4.2
• Methodological and technical problems

4.2.1
How 'verified' carbon credits are generated: key stages and terminology in offset project development

The methodologies and processes behind the development of offset projects and the ultimate 'verification' of carbon credits are complex, labyrinthine, multi-layered and over-lapping. The documentation for any given project can run over a thousand pages, often with much repetition, multiple re-issuing of slightly changed drafts, and frequently shifting standards or requirements. Projects may also apply logic-defying 'adjustment' factors and frequently use proxies rather than measurements obtained in the project area itself.

The language employed in the documents is typically highly opaque and 'technical', even if the actual projects and verification of them are often severely lacking in rigour even in upholding the basic methodological requirements. As explained in the previous section, "verification" in offset projects always involves verification of unprovable counterfactuals, with the result that there will always be "some uncertainty here around integrity issues", as a representative of a project developer pointed out.

The diagram in Annex 2 briefly explains the main steps of developing a typical offset project, from its conception to the issuing of carbon credits. The process described in the diagram is specific to projects developed to generate carbon credits in accordance with the Verified Carbon Standard (VCS, or Verra) process. This verification system dominates the carbon offset markets and is the one used by almost all the projects supplying Shell with carbon credits. Other systems, such as the Gold Standard or the Climate, Community & Biodiversity Standards, apply broadly the same process, with slightly different agencies involved.

Carbon markets industry key player in the development of dominant voluntary carbon market verification system

The dominant offset standard organisation, Verra, was originally set up by three organisations – the World Economic Forum, the World Business Council for Sustainable Development, and the International Emissions Trading Association. Verra has provided the verification of most of the offset projects from which Shell has purchased carbon credits. Verra has approved more than 70 methodologies, with 'nature'-related offset methodologies accounting for more than half; and within these, forest-related methodologies are the most numerous, with 16 different methodologies that can be used to generate forest-related carbon credits.

Whilst Verra invites public comment on draft methodologies, it is itself the ultimate arbiter of whether any given methodology is approved, and in what form. The methodologies can be developed by anyone. Several Verra-approved methodologies have initially been proposed by project developers to quantify the alleged emission savings of their own projects.

Conflicts of interest

Verra, which is registered as a non-profit organisation (though one that pays salaries comparable with large for-profit enterprises), receives a commission for every carbon credit which is eventually verified. It is also paid by offset project operators to put carbon credits on the Verra carbon registry. Verra thus has a strong vested interest in approving as many methodologies, projects and carbon credits as possible. The developers of the methodologies are paid a 'licence' fee by Verra, and hence have an interest in them being used as widely as possible. As with other certification systems such as the Forest Stewardship Council, there are also economic incentives for the third-party certification or verification companies to approve ('validate') projects rather than reject them: companies with a known record of rejecting projects or raising too many objections are unlikely to find themselves winning future business.

In the case of the Verra system, a positive validation will likely lead to additional revenue earnings for the validating company through then verifying the same project for the first years of its credit generation.

4.2.2
Leakage

Leakage is the problem that, rather than definitively preventing some emissions from happening, the project (if it has any impact at all) simply causes the emissions to move elsewhere (and thus results in no net benefit for the climate). Leaked emissions reductions have to be deducted from the number of credits issued, hence offset projects have an interest in showing that leakage is minimal or zero. As will be seen in one of the case studies, leakage can be a serious issue with nature-based projects, especially where they claim to be protecting relatively small areas in the face of much larger trends (such as large population migrations into remote areas). In such cases, the likelihood of leakage is extremely high, because even if, say, the supposedly protected area is not deforested, this does nothing to prevent the underlying causes of forest loss. Deforestation by the in-migrants will simply occur elsewhere. Or, if the demand for products of deforestation, such as beef, soy, timber, cacao, rubber or palm oil, grows, the conversion of forests for agriculture or degradation for timber will simply occur elsewhere.

Certain mechanisms are used in offset projects to detect and account for such leakage (such as requiring definition of and carbon accounting in a 'leakage belt' around the project area). As our analysis of the Cordillera Azul project in Peru shows, these seem to be inadequate for the purpose, and can also be manipulated to minimise the appearance of leakage and thus reduction of credits issued.

4.2.3
Miscalculating, understating, or ignoring, actual emissions from the project

Nature-based solution offsets have been shown to face problems with how *actual* carbon emissions in offset project areas are treated.[74] These actual emissions should be carefully monitored, and deducted from however many emissions are deemed to have been prevented. However, there are many mechanisms in carbon offset project methodologies whereby these actual emissions can be made to appear minimal or ignored altogether and thus do not count against the volume of carbon credits generated from the counterfactual baseline calculations.

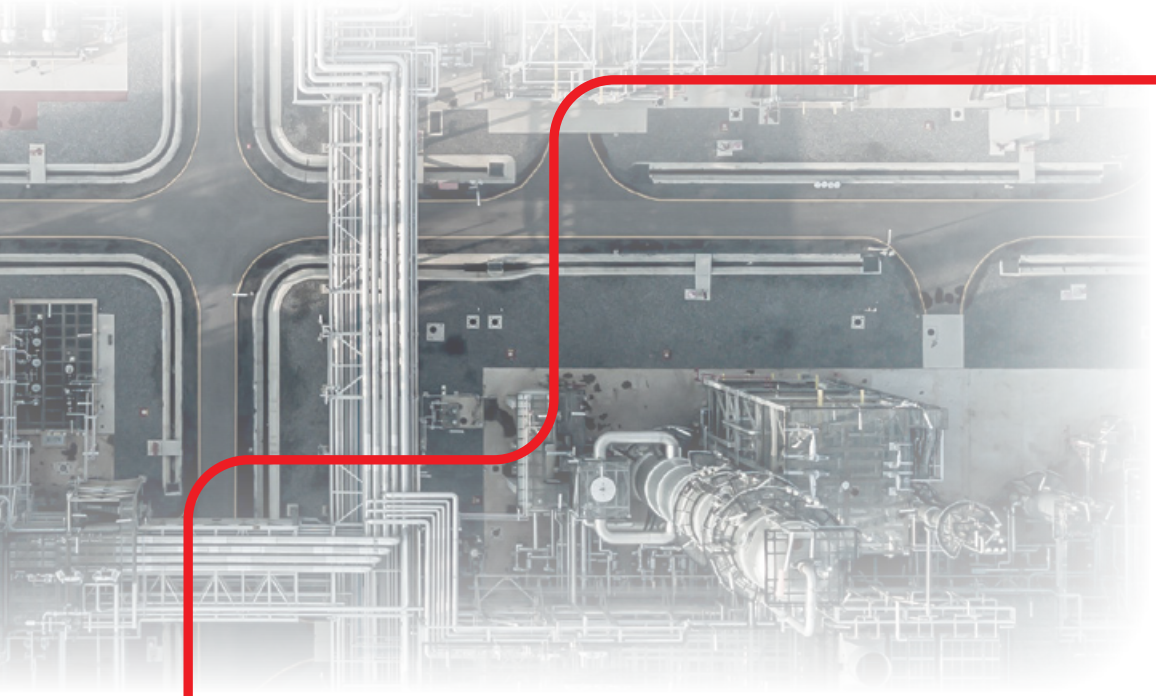
In some of the VCS methodologies for developing nature-based offset projects, there are provisions under which actual emissions occurring in project areas (or 'leaked' to the leakage belt) can be considered as insignificant ('*de minimis*'), and can be ignored altogether. Typically, such *de minimis* allowances are 5% of the projected baseline emissions. However, if the hypothetical project baseline is inflated (as often seems to be the case) then 5% could still represent a significant volume of emissions that is not deducted from the credits issued by the project. The numbers could be significant, particularly if calculated over the entire lifetime of a project.

Any of the above could serve to reduce the legitimacy of claimed reductions, or eliminate it completely. Whilst suppliers, buyers and traders in carbon credits point to the fact that these are independently verified, the reality is that the validation and verification of projects are typically very lax. Validation and verification agencies have a vested commercial interest not to probe these kinds of problems too deeply, as their business model ultimately depends on issuing carbon credits, not rejecting them. In some cases, egregious failures of projects to fulfil requirements of additionality, use of proper baselines and avoidance of leakage have still resulted in the verification of projects and the issuing of credits.[75]

4.2.4
No convincing insurance to make up for unexpected release of carbon stored in trees

While CO_2 molecules currently being emitted to the atmosphere would normally be expected to remain there for some centuries, 'verified' carbon projects are typically of much shorter duration – usually only a few decades at most. The mechanism developed to compensate, for example, for premature termination of a project, or where projects are shown to be based on highly implausible assumptions are inadequate. Offset projects under Verra are required to retain a small 'buffer' pool of carbon credits that cannot be marketed.

For the same reason there is a vested interest in validating and verifying projects, there is a vested interest in minimising the assumed risks to the project, which is what determines the amount of non-saleable emissions reductions that are held in the project buffer. The evidence suggests that buffers are systematically inadequate,[76] increasing further the risk that real and verifiable fossil carbon emissions will not be compensated as claimed by alleged savings of the carbon offset project.



5
The Case Studies

This section discusses the three projects from which Shell has purchased most of its carbon credits to date. We explain how, despite having been certified as compliant with methodologies approved by Verra, the carbon industry's dominant standard setter, all the projects fail to provide this level of evidence. In some, the basic claim to additionality is implausible. In addition, none of the projects has rigorously adhered to the specified standard under which it was developed. All use implausible baseline assumptions.

For one, there is also a question of possibly very high levels of leakage that are not adequately recorded. All of them furthermore fail to demonstrate how they will provide the long-term storage of carbon that would be required for a claim that the climate impact of fossil carbon releases into the atmosphere is being compensated.

5.1
• Cordillera Azul National Park (CANP), Peru

Figure 2:
Location of the Cordillera Azul NP in Peru

5.1.1.
Summary of the project

The project is known as the Cordillera Azul National Park REDD Project (Verra Project #985). It covers some 1.35 million hectares of the Cordillera Azul NP in Peru (see Figure 2) and is mostly lowland and montane forests. The National Park is a public-private partnership, the area being owned by the government of Peru but managed and financed by the Peruvian NGO Centro de Conservación, Investigación y Manejo de Áreas Naturales (CIMA). Verra reports that around "180,000 people in more than 200 communities – immigrant and indigenous – neighbor the park".[77] The project was initiated in 2008, though only validated for VCS by the consulting company SCS in 2013, with the first verification having taken place at the same time.[78] According to the Verra registry, the first carbon credits for the project were issued in July 2015. It is intended to generate carbon credits until August 2028, this being determined by "*the length of the management contract between CIMA and the Peruvian government*".[79] The project used the Verra 'VM0007 REDD Methodology Module' in its design. Shell has bought approximately 3,700,000 carbon credits from this project.

5.1.2. Additionality

According to the Project Document, it is claimed that the additionality follows from two arguments: i/ that without an organisation to run the Park, the Peruvian government would not have designated it in the first place and ii/ that "*in the absence of this REDD project, the intense deforestation surrounding [CANP] would overwhelm any weight that a national park designation carries when it is only a "paper park" and the intact forests of the park would succumb to fragmentation and deterioration.*"[80]

There are grounds to question both these assertions. First, the initial work to establish a protected area in the region had already begun in 1999, with an official recommendation that part of the area be protected from timber exploitation. This was followed by formal establishment of a reserve in September 2000.[81] Following biological assessments, supported by the Chicago-based The Field Museum, a Decree establishing the CANP was passed on 21 May 2001. Under this decree, the Peruvian government is placed under a legal obligation to protect the area "in perpetuity", irrespective of any offsetting initiative.[82]

The organisation, CIMA (Centro de Conservación, Investigación y Manejo de Áreas Naturales), which was formed specifically to manage the park, began work in 2002, collaborating with the Field Museum.[83] The possibility of future carbon funding was not reported as a consideration in the establishment of the park. The Field Museum's 2002 reports of the founding of the park make no reference to carbon funding, nor to any conditionality in the designation of the area concerning the availability of external funding.[84]

Following its designation, the park did in fact receive funding from external sources, including from USAID, the US-based Gordon and Betty Moore Foundation, and the Packard Foundation.[85] Under these, among other things, a 'master plan' for the park covering 2003-2008 was drawn up, and published in 2006.[86] This noted that "*the park's short-term sustainability is assured*" through US donor commitments. In a sole and vague reference to carbon funding, the plan mentioned that "*other financial mechanisms will be explored in the coming years, such as… sale of goods and services (eg carbon capture)*".[87]

In fact, the carbon project document itself confirms that carbon funding was not seriously considered until a financial crisis struck in 2007, i.e., six years after the park had already been established and was up and running: "*In 2007 [CIMA and The Field Museum] recognized that a REDD project may provide an option for sustainable funding for the park and buffer zone activities. After much investigation to learn more about REDD, the two organizations actively sought project sponsorship to provide funding for the development of the REDD project…*".[88]

That year, CIMA signed a new contract with the government, for 20 years, for full management of the park, allowing it to use revenues from the sale of carbon credits.[89]

There are also serious doubts about how much additionality can be claimed from the perspective of providing practical protection for the park that otherwise could not be afforded. The project claims, for example, that "*Without the project, land-use zoning and tenure processes would be limited to non-existent and illegal activities would seldom be reported to the correct law enforcement authorities by community members*".[90] Of course the counterfactual claim that no other source of funding would have been available cannot be disproven, but perhaps a more plausible assumption is that the government, with external support, would have funded it. Of the 15 national parks in Peru, only one other (Bahuaja-Sonene) has been (part-)funded with carbon offsets.

Funding for CANP, amounting to $10.6m,[91] from a variety of external grant sources, continued until at least 2013, six years after the decision to pursue carbon funding had, apparently, already been taken.[92] More recently, a Peru Natural Legacy fund was announced, providing $140 million funding for the country's protected areas[93] – which, according to a spokesperson for the national protected areas' agency, SERNANP, reportedly could potentially be used to fund CANP.[94] SERNANP's overall budget more than trebled from its creation in 2008, to reach $22 million in 2016.[95]

The actual amount allegedly required to protect the park compared to how much is generated by the carbon credits is also not plausible. According to the project document, the park's annual management costs in 2011 were around $1.7m per year, and it was on this basis (incremented by 20% to include additional costs of the carbon project)[96] that the case for the need for carbon funding was claimed. However, less than 40% of the stated management costs was for actual protection of the park, with 36% being for activities in the 'buffer zone', which is not included in the carbon project accounting area, and 25% for "information collection and analysis", coordination and monitoring; CIMA's administration; "government relations"; and "fundraising efforts". The project assumed around one million carbon credits per year would be generated in the scheme's first few years, being sold at around $3/ton and rising to $4-$5/ton for two million or more carbon credits per year from around 2014 onwards[97] – thus far exceeding the known actual costs of protecting the park.

According to various reports, the main threats to the park had in fact been rapidly resolved following its establishment in 2001. The CIMA carbon fund project document itself says that "*No illegal logging activities have been observed by park guards in or immediately around the project area since 2006*", i.e., seven years before the carbon project was validated.[98] This document also states that "*no evidence of significant slash and burn agriculture, motorized boat or vehicle fossil fuel use, or other sources of non-CO_2 emissions have been observed within the park boundaries by CIMA technicians or park guards or in imagery analysis since the park was formed in 2001.*"[99] A USAID report from 2013 also noted that the park had addressed most of its threats years before the carbon

project started, saying: "*By 2006, illegal logging was completely eradicated from five basins where it was previously established and growing and, by 2008, the last farmers inside the park prior to designation were relocated in a consensual and peaceful manner*".[100]

Ultimately, setting aside the counterfactual non-falsifiability, there is also the problem that the actual amounts of funding generated by the project being used for necessary and effective protective purposes is not publicly available. According to the project document, "protection activities" are the largest beneficiary from the sale of carbon credits, but the full distribution of benefits is "confidential".[101]

As with almost all externally driven protected areas, reliant entirely on donor funding, the Park went through periods of financial uncertainty. This did not negate the legally protected designation of the park, nor the government's obligation to protect it. As the environmental journalist David Hill has put it, "*For it to be truly "additional", the park would have had to be established on the explicit condition that a carbon project would be hosted there, irrespective of who was managing it and how it was funded*".[102]

The plausibility of the additionality claim for a part of the park is further weakened by the presence of uncontacted Cacataibo (also spelled 'Kakataibo') Indigenous peoples within the area. This presence has always been known. As the project document notes, "*The possibility of non-contacted indigenous people from the Cacataibo group living in the southeast region of the park led to the establishment of a "strict protection zone" (Zona de Protección Estricta in Spanish) in the region that permits zero outside entry*".[103] In August 2017, the Kakataibo people obtained legal recognition of their existence.[104] In 2021, the Kakataibo Indigenous Reserve was created, part of which immediately abuts the south-eastern boundary of CANP.[105]

5.1.3. The project baseline

There are two key parts to selection of a baseline with which to compare the subsequent performance of the project area: the area chosen (the 'spatial reference') and the historical time period used to project a future scenario for what would happen in the absence of the project (the 'temporal reference').

For this project's spatial reference, the area of 21 municipalities forming part of, or broadly surrounding, the park was selected (see Figure 3). No specific rationale is given for this selection (which does not even represent the Park's buffer zone), though the reason why some municipalities were *excluded* from the baseline assessment is given. The document states merely that "*The* [*reference area*]*...includes all significant forest areas surrounding the project area that are accessible and attractive to local deforestation agents, with the exception of the southern/ southwestern districts*".[106] This already indicates that a reference area was selected based partially on where deforestation *was already occurring*, instead of whether it was comparable or not to the actual offset project area. With some modifications, the area within these 21 municipalities, but outside of the actual national park project area, also served as the project's 'leakage belt' (see Box under 5.1.4).

As can be seen from the deforestation map below, this would seem not to have been justified. The extension of the reference area far to the west includes municipalities where extensive deforestation was occurring, such as around Nuevo Lima and Cusco and other settlements on the relatively fertile flood plains of the Huallaga River and its tributaries. Similarly, even though the area to the east is largely intact, the reference area extended as far as the Ucayali river and the deforestation centre around the town of Contamana. Inclusion of these areas would have inflated the rate of deforestation projected for the project area.

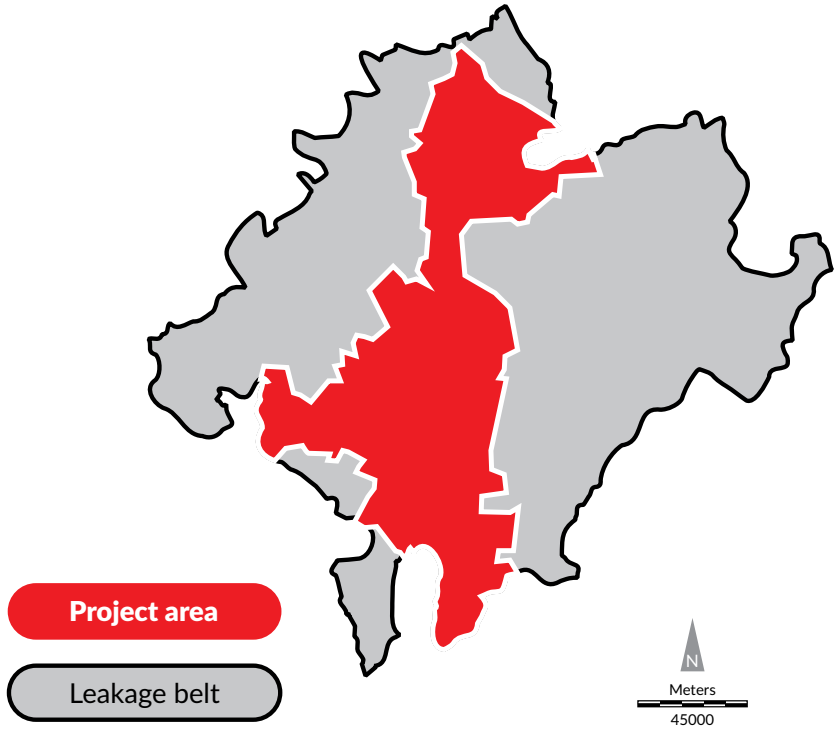


Figure 3:
Carbon project reference area in relation to Cordillera Azul National Park

In reality, even before 2004, deforestation in the park was extremely limited – around 300 hectares per year, or around 0.02%/year (see Figure 4). This is perhaps explainable by the topography of the area: as Figure 5 shows, the park consists largely of steep and inaccessible valleys, with the peaks rising to over 2,000 metres altitude. It is quite a different location from the lowland valleys to the west and the Amazonian plain to the east. Some of the most inaccessible areas were removed from the baseline calculation to reflect that they would be very unlikely to be deforested in any plausible scenario.[107]

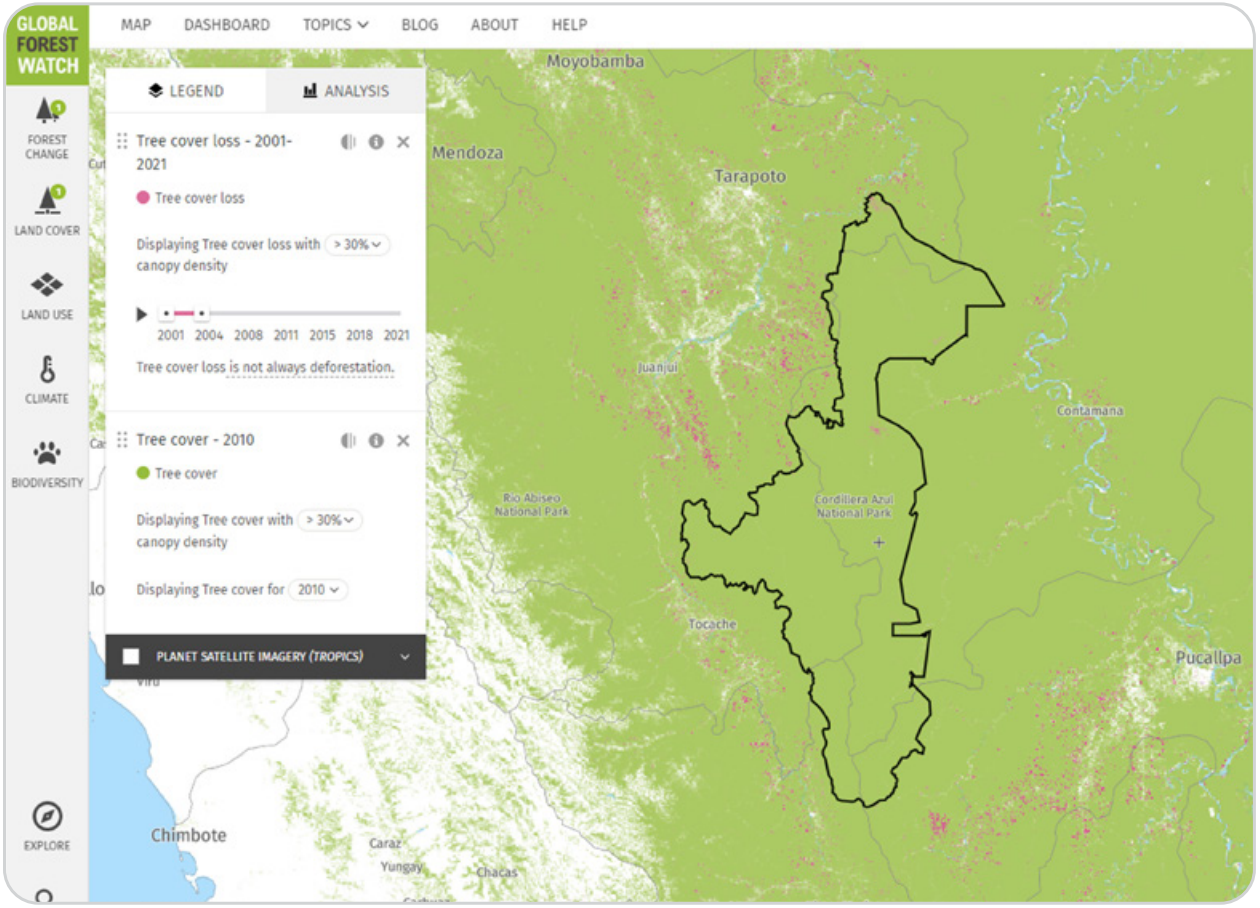


Figure 4:
Deforestation in Cordillera Azul National park and surrounding areas, 2001-2004 (deforestation shows in pink)

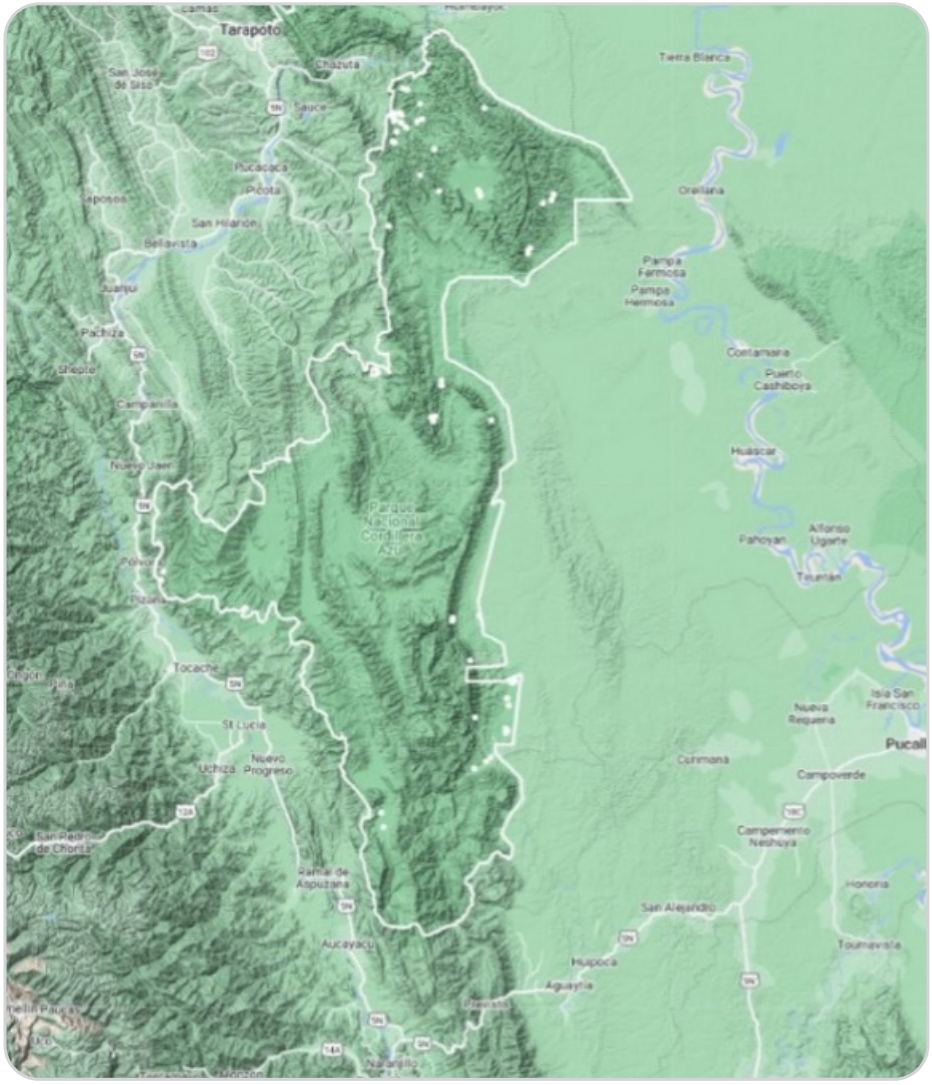


Figure 5:
Relief map showing location of Cordillera Azul National park

The future course of deforestation was modelled on the basis of a relationship between the human population in the area, and the extent of deforestation. First a correlation equation was created using the actual population count in each of the municipalities, and the recorded deforestation for 1998-2003. Then, population growth was projected forward and the corresponding rate of deforestation applied to that future population. Of course, actual future population cannot be known, and there were no official projections,[108] so the project itself applied either an exponential or linear population growth rate to each municipality.

This application of exponential growth rates produced some extraordinary results: for example, in the municipality of Bajo Biavo, to the west of the project area, the population was projected to increase five-fold between 2008 and 2018. In the large district of Pampa Hermosa (centre-north of the project area), the population was projected to increase eight-fold in the same ten-year period, equivalent to a 26% annual compound growth rate. This compared to an average *actual* population growth rate of 2.1% observed in the area from 1993-2002, as reported in the Park's own Masterplan of 2006.[109]

This massive inflation of population growth rates in turn of course generated enormous projected 'baseline' deforestation rates (which had to be artificially constrained in some cases[110]). In the case of the 734,700 hectare Pampa Hermosa district,[111] for example, the average rate of deforestation of around 645 hectares per year (0.09%/year) from 1989-2003 was projected to rise to around 17,500 hectares per year (2.4%/year) by 2016, a 26-fold increase in the deforestation rate.

A fairly complex multifactorial analysis was then applied to determine 'at risk' parts of the national park carbon accounting area. The model used for this is not at all transparent, but resulted in an estimation that, for the counterfactual baseline, 68,351 hectares of the park would be deforested between 2009 and 2018 in the absence of the project.[112]

This can be compared with the actual observed deforestation occurring in the project area, as assessed through the Global Forest Watch website (and using the project area shape file provided on the Verra project site).

Year	Projected deforestation for baseline (ha)	Actual observed deforestation (using Global Forest Watch) (ha)
2009	4.256,82	193
2010	5.420,34	64
2011	3.216,33	247
2012	3.818,16	257
2013	4.754,79	1.300
2014	6.254,28	449
2015	7.939,89	1.620
2016	9.533,52	762
2017	10.748,34	304
2018	12.409,38	220
Total	**68.351,85**	**5.416**

Table 2:
Projected deforestation for the calculation of the baseline, versus actual observed deforestation, 2009-2018

As can be seen, the projected deforestation for the purpose of establishing the emissions baseline was more than twelve times the actual observed deforestation over the full period. It should be remembered that no carbon credits were sold by the project proponents until the middle of 2015. This indicates that, for the first six or seven years of the project at least, the baseline for how much deforestation would occur in the absence of the carbon offset income was significantly exaggerated. This resulted in a greatly inflated figure for the claimed emissions reductions caused by the project and therefore the number of carbon credits issued.

Importantly, as will be seen below in the section on leakage, the population projections for the 21 municipalities (which, outside the project area itself, constitute the leakage belt) also resulted in a huge estimated baseline of 368,562 hectares of deforestation that would occur in the project's leakage belt from 2008-2018.[113]

Concerning the temporal reference, the project document states that "*The reference timeframe was 1989 to 2003, which represents land use change dynamics in the reference region in the absence of CIMA's activities. CIMA's activities were implemented from 2003 to 2008 and would be suspended in the baseline from 2008 onward.*"[114] In other words, even though the national park had apparently, according to its and the donors' own reports, already had considerable success in reducing the threats to the park before the carbon project, this period was explicitly excluded from the baseline – thus making the carbon offset project appear more successful.

5.1.4. Leakage

Another issue calling into question the compensation claim derived from carbon credits originating from the project is leakage – the extent to which any emission reductions inside the project area have simply been shifted elsewhere (and thus resulting in diminished or no real net emissions reductions). Again, to some extent, this is recognised by the project proponents. However, the methodology used in developing the project allows for assessment of the leakage levels which both defies common sense and almost certainly underestimates the real level of displacement of emissions to elsewhere.

For reasons that are not explained in the project document, the leakage of deforestation from the project area is assumed simply to be 20%.[115] In a very complicated calculation, a further factor of 32.5% was introduced, representing the proportion of deforestation caused by recent immigrants to within two kilometres of the park boundary. Combining these and other factors together, an assessment was made that exactly 26.63% of the emissions that would have occurred in the park would be leaked elsewhere for each of the first ten years of the project.[116] In practice, calculations for the project's actual monitoring reports – as then verified for Verra to confirm the carbon credits eligible for issue – reduced the recordable leakage to *zero*. This is because, whilst it was acknowledged that some (minimized) leakage was occurring, this amounted to less than the (artificially inflated) baseline emissions occurring in the leakage belt.

What is a 'leakage belt'?

The 'leakage belt' of a project is an area, usually adjacent to or surrounding the actual carbon project accounting area, where, it is assumed, any emissions displaced from the project area (rather than being stopped altogether) would be detected. For all such offset projects, a baseline counterfactual projection of emissions is calculated for the leakage belt, as well as the actual project area, and changes in actual emissions within it are also monitored. If the actual emissions in any given monitoring period exceed the theoretical baseline, then it is assumed that some of these emissions have 'leaked' from the project area, and these are then deducted from the claimed 'emissions reductions for the project'. If the projected 'without project' baseline for emissions in the leakage belt is set very high, then any real leakage from the project area is likely to be discounted or ignored completely.

The project is active in monitoring deforestation around the park, and makes some efforts to address it. But, as noted above, the claimed emissions reductions are ultimately based on projections of population growth, and how many people were projected to have been in the project area causing deforestation had the project not been there to stop them. The project, of course, cannot affect the population growth even in the areas surrounding the park, and does not claim to do so. It can do nothing about the much wider economic-demographic processes that, for decades have driven mass colonization of the Amazonian lowlands to the east of the Andes.[117] History has shown that once an autonomous process of settlement expansion has started, it is almost impossible to stop.

If in-migrants, existing farmers, their offspring and families are not entering the CANP, they will simply be clearing land elsewhere, whether in the CANP 'leakage belt' or further afield. With unprotected forest land relatively abundant, even in close proximity to the park, leakage could in fact be close to 100% – that is, as much forest might well be cleared somewhere else as would have been cleared in the project area if the project had not been there. This would effectively reduce the valid emissions reductions from the project to zero. As can be seen very clearly from satellite monitoring data, deforestation in the region surrounding the park increased from 2001-2010 to 2010-2020 (see Figure 5).

How much of this is effectively leakage from deforestation that would have occurred inside the park without the carbon project is of course impossible to know. However, as the project has done nothing to address what it itself says is the underlying driver of deforestation (population growth), it should be obliged to explain why, in the absence of any intervention to change this driver, the leakage is not 100%. Nevertheless, the first four monitoring reports for the project (covering 2008-2016) recorded zero emissions leakage, and every corresponding verification report issued by Verra-accredited auditing firms has duly accepted this claim. Some leakage started to appear and was discounted from the issued emissions in 2017-2018, but this only amounted to less than 5% of the carbon credits actually issued.[118]

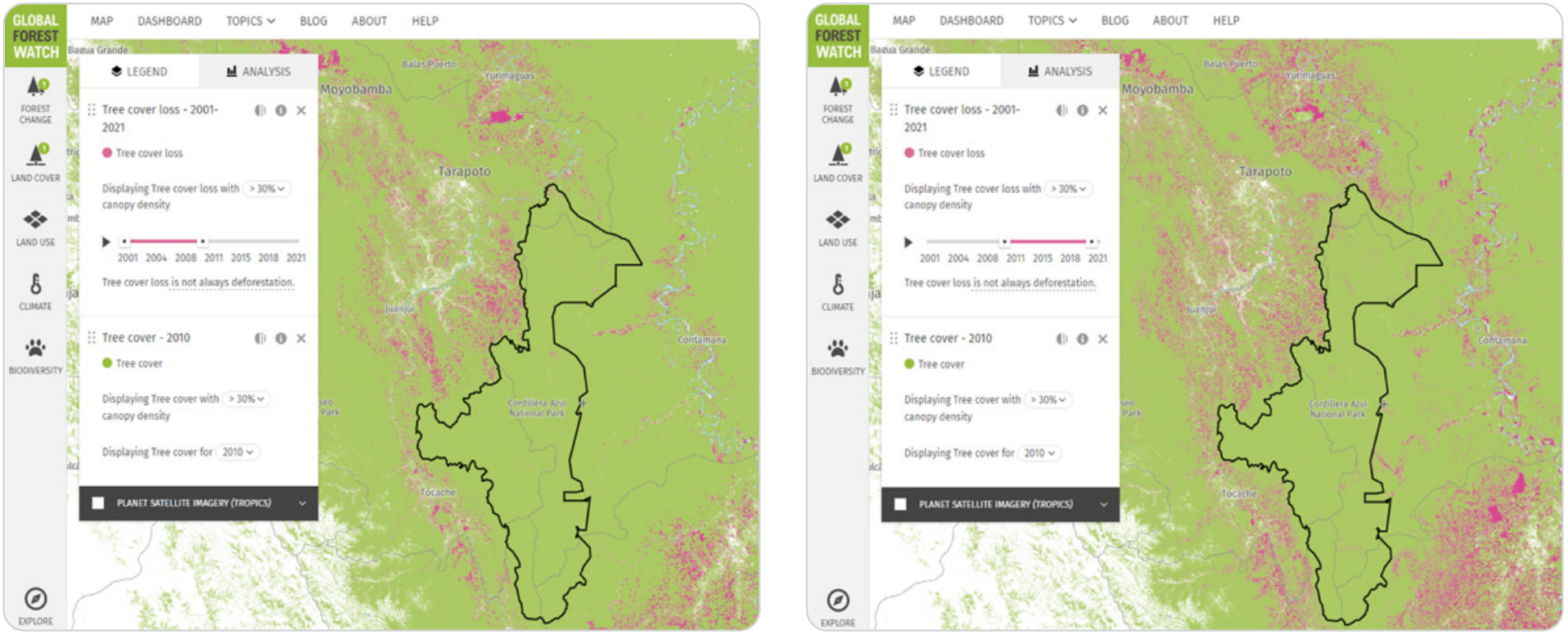


Figure 5:
Comparison of deforestation around Cordillera Azul National Park, 2001-2010 (left) with 2010-2020 (right)

5.1.5.
‘Co-benefits’? A park challenged by indigenous peoples

According to project documentation, more than 300,000 people lived in the districts surrounding the park in 2008, 180,000 of them in the buffer zone, and project proponents expend a great deal of effort showing how the park/project has sought to engage them with its objectives.[119] It was also known from the outset that an uncontacted group of indigenous Cacataibo (also spelled ‘Kakataibo’) peoples live in the southern part of the park. Eventually, this part of the park received an additional layer of strict protection in accordance with the law.[120]

However, almost entirely missing from the project description is the existence of Kichwa communities with a territorial claim over part of the park area. The document notes that “*The only officially recognized indigenous population on the Huallaga side (with land titles as a “native community”) is a small Quechua-Lamista community in the district of Chazuta* ”. According to the local indigenous federation, the Consejo Étnico de los Pueblos Kichwa de la Amazonía (CEPKA) and one Kichwa community, Puerto Franco, the CANP has blocked the community’s land title claims to several thousand hectares of the park.[121] They say they weren’t consulted about either the park or the carbon project before they were established, as was their right under international law.

In July 2020, the community started a court case against the Peruvian Government and the CANP, challenging their “*refusal to title their traditional lands, the imposition of exclusionary conservation and profit-making from carbon credits sold without their consent*”.[122]

According to the UK-based Forest Peoples Programme, *“the carbon credit market forms part of an exclusionary model of conservation which impedes communities from participating in the governance and communal titling of their lands*”.[123] It has been suggested that the project is in breach of the International Labour Organisations convention 169, Article 8j of the Convention on Biodiversity, and an Inter-American Court ruling.[124] In July 2022, the Kichwa people of the San Martin region requested the International Union for Conservation of Nature (IUCN) to remove CANP from its ‘Green List’ of supposedly well and equitably governed protected areas.[125]

5.1.6.
Conclusions to the case study

This project illustrates one of the underlying contradictions when a carbon offset project is established to fund an existing protected area: most such areas will have a prior history of donor support, that will typically have claimed significant success as a result of their efforts to conserve the area. However, the additionality requirements of a carbon project are exactly the opposite; it has to be demonstrated that the area remains seriously threatened, despite whatever efforts had preceded the carbon project. Various ‘stories’ are created to resolve these mutually incompatible narratives.

In the case of this project, it was implied that the protected area would not have been designated at all had there not been carbon funding available and that there was no alternative to carbon funding. Then, in the setting of the baseline, the results of the park prior to the carbon offset project elaboration in preventing deforestation before the carbon project started were simply ignored. In addition to the demonstrably implausible additionality of the project, baseline assumptions for population growth inside the project area are implausibly high (and thus inflate alleged emissions reductions) and the assessment of project leakage highly questionable. As a result, the carbon credits sold by the project are highly unlikely to represent avoided emissions that otherwise would have occurred. In addition, they are generated from a project that takes place in the context of a conflict between indigenous peoples and the government of Peru over rights to the land today designated as a national park.

5.2
• Kasigau Corridor REDD Project Phase II, Kenya

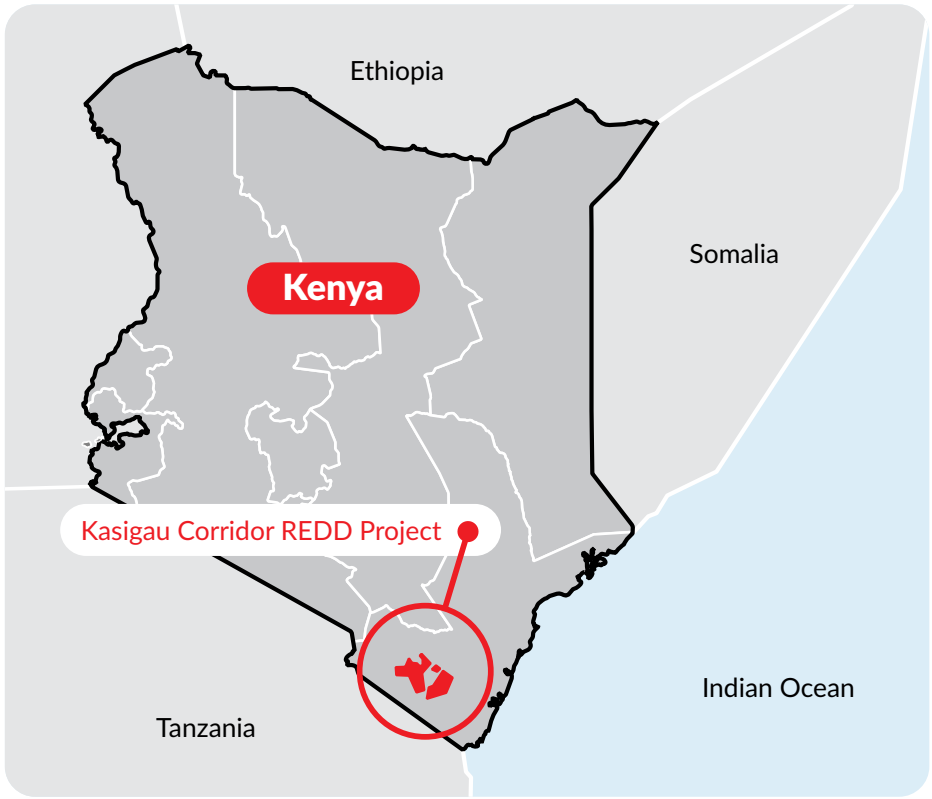


Figure 6:
Location of the Kasigau Corridor REDD Project Phase II in Kenya

5.2.1.
Summary of the project

The project is known in full as 'The Kasigau Corridor REDD Project Phase II – The Community Ranches',[126] and is Verra-verified project #612.[127] The project followed from a much smaller 'Phase I' offset scheme. The 'Phase II' project covers 169,741.4 hectares in southern Kenya, occupying a corridor of land between the Tsavo West and Tsavo East national parks (see Figure 6). The two main (and separate) areas of the project flank the Rukinga ranch to the west and east. Rukinga was the location of the 'Phase I' project, and is the ranch purchased in 2000 by a Californian businessman, who by then had already founded the carbon project company Wildlife Works Carbon and established some income generating initiatives in the area. One of these produced clothing sold in outlets in the US and elsewhere.[128] Wildlife Works Carbon claims that it "began to protect" the land in Rukinga ranch in 2005.[129]

According to Wildlife Works, the Phase II project, involving 13 'community ranches', will result in total "*estimated gross emissions reductions over the 30-year crediting period of 48,448,769 m.t. GHG or, on average, 1,614,959 m.t. GHG per year*".[130] Allowing for the buffer pool, some 38 million carbon credits would be generated over the project's lifetime, which runs until the end of 2039. The first offset credits from the project were issued in March 2014. The project was developed under a VCS-approved methodology ('VM0009') that Wildlife Works Carbon itself had developed.

The methodology and title of the project describe it as 'Reducing Emissions from Deforestation and Degradation', though much of the project area barely qualifies as forest, and some of it is essentially grassland.[131] Shell has bought approximately 930,000 carbon credits from this project.

The objective of the project is:

> *"to protect in perpetuity those dryland forests that form a wildlife dispersal and migration corridor between Tsavo East and Tsavo West National Parks, to conserve the important biodiversity found in those forests, to provide alternative sustainable development opportunities for the local communities that live adjacent to the forests and to prevent the Emissions that would otherwise occur were those dryland forests to be converted to subsistence agriculture using the Slash and Burn methods typical to this area of Kenya".*[132]

Wildlife Works acquired the carbon rights for the 13 ranches (which are owned by between 50 and 2500 individual shareholders each) by signing conservation easements with these owners.[133]

5.2.2. Additionality

Under the project methodology (which WWC itself had developed), the additionality of the project would have to be demonstrated through various means, specifically by providing in the project document:

> *"1. A list of alternative land use scenarios to the project.*
>
> *2. Justification for the selected baseline scenario of deforestation/ conversion to agriculture.*
>
> *3. An investment or barriers analysis (VCS, 2010b) proving that the project is not the most economical option.*
>
> *4. A common practice analysis (VCS, 2010b) including a list of project activities and the drivers of deforestation that they address.*
>
> *5. Evident compliance with the minimum requirements of the aforementioned VCS tool. This evidence may be the same as the evidence provided to meet reporting requirements listed in section 4."*[134]

Apart from the second point, addressed in the next section of this analysis, none of these are presented in the project document. The introduction to the project claims that "*we will prove that the project is indisputably additional (under the project financial additionality tool)*"[135] – but no such 'financial additionality tool' is presented in the project document either. Rather than presenting any of the information required or an analysis of the possible alternatives, the project essentially makes the blunt assertion that:

> *"There is little need for speculation as to what would happen in the absence of our project if we ceased to protect the project area and stopped presenting alternative livelihoods for the community: the mosaic pattern of deforestation would certainly expand into the project area."*[136]

The document adds:

> *"We therefore believe that we have demonstrated, through our efforts to attempt many different economic activities, and by the fact that all the group ranches in the area have substantial annual and carry forward operating losses, that there are no credible alternative economic uses for this land that could compete with the project financially, or provide financial sustainability that would otherwise protect it from slash and burn use by the community".*[137]

No explanation is provided in the project document either on how a project whose calculations arise from a counterfactual scenario can "indisputably" demonstrate that something would or would not have happened.

Whilst the existing cattle ranches may have been unprofitable, this in itself does not "indisputably" rule out other equally or even more plausible scenarios (including doing nothing at all). Ultimately, the claim to additionality seems to rest on the self-declared assumption that the project's intended activities were expensive, and the only possible option:

> *"Protecting this 169,741ha piece of dryland forest comes at a significant cost. There are no significant sources of income from the land to offset protection costs. Therefore, this project could not be contemplated in the absence of carbon funding".*[138]

As represented by the contents of the project document, the project is clearly not compliant with the requirements to demonstrate additionality as set out in the project methodology. As we will see in the next section, the assumptions about what would happen in the absence of the project are also highly open to question.

5.2.3. The project baseline

As the validation report for the project puts it, "*The project avoids emissions to the extent that monitored deforestation is less than predicted baseline deforestation, adjusted for changes in biomass carbon stocks*".[139] In other words, the emission reduction claim rests largely on a reference to the counterfactual projection of what would have happened in the project area if the project had not occurred. The project document claims that:

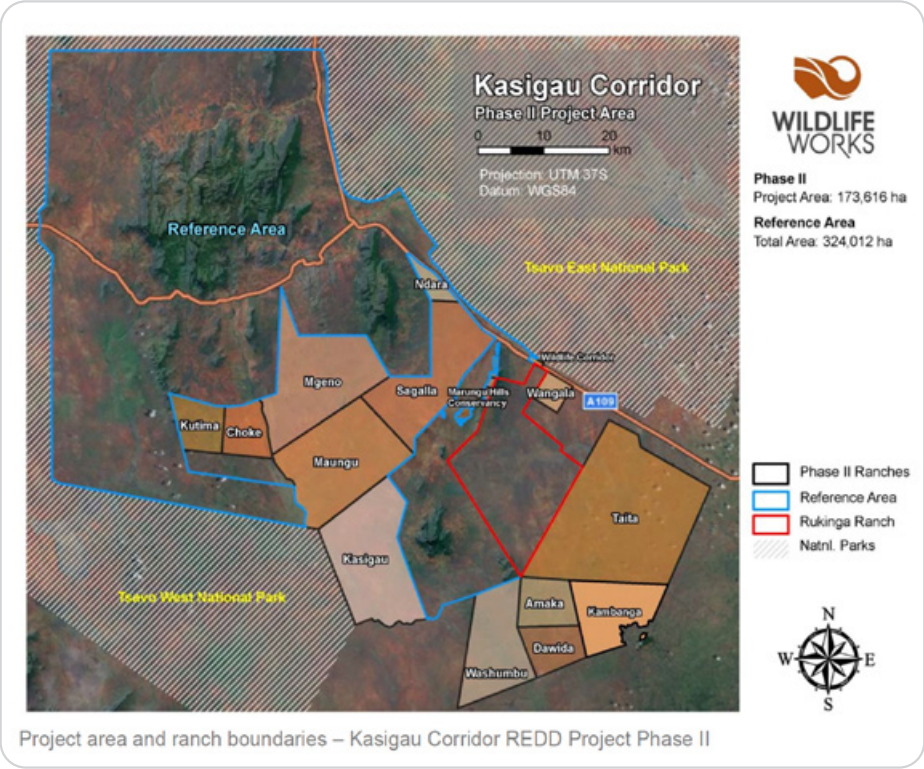
> *"Unlike many REDD projects, it was not difficult to identify the baseline scenario for this project, which is rapid deforestation due to unplanned slash and burn agricultural expansion by subsistence immigrants at the frontier of human expansion, as all the conditions of the baseline were in place before the arrival of Wildlife Works."*[140]

However, closer inspection raises serious questions about this simple assumption. According to the project methodology, a 'condition of applicability' (i.e, whether the project is compliant with the methodology) is that "*The most conservative baseline scenario is defined by deforestation / conversion to agriculture*".[141] As a study of the project carried out by the Swedish Society for Nature Conservation (SSNC) explains, in the baseline scenario "*almost all of the above- and below-ground forest biomass and 55 percent of the soil carbon in the Phase II project area would be lost due to the expansion of slash-and burn agriculture.*"[142] This scenario was defined by the project proponent on the basis of an analysis of deforestation in a reference area that borders the project area. The observed deforestation in the reference area was then extrapolated, to suggest "*that more than 90 percent of the reference area will be deforested within 30 years from the project start date*".[143]

Under the project methodology, the project proponent must "*ensure that the agents and drivers of deforestation in the reference area are similar to those of the project area*", including in terms of any topographic constraints, land use and proximity to markets, and social and cultural conditions etc.[144] However, a comparison of the reference area with the project area shows that this is clearly not the case. As can be seen from the Wildlife Works Carbon maps of the project and reference area (see Figure 7), the reference area largely lies to the north of the project area, and a small part of it to the south-east.

The northern area includes most of the Taita Hills. As a 2020 study of the area explains:

> *"The Taita Hills in southern Kenya are part of the Eastern Afromontane Biodiversity Hotspot and represent a highly diverse cloud forest ecosystem. However, the cloud forest suffers extremely from wood and timber exploitation and transformation into exotic tree plantations and agricultural fields."*[145a]



Project area and ranch boundaries – Kasigau Corridor REDD Project Phase II

Figure 7:
Map of the project and reference areas[146]

The deforestation in this area is in fact rooted in colonial period exploitation, and "*Large-scale decreases in forest cover were caused by construction of railways between 1898 and 1924*".[147] Significant areas of exotic eucalyptus, pine and cypress trees were introduced after the 1950s, in an attempt to address the environmental degradation and loss of local resources this had set in motion.[148]

By comparison, the project area is lowland, much less wooded, hotter and drier. The relatively high rainfall in the Taita Hills makes this a more attractive location for farming. There is a very steep (downwards) rainfall and (upwards) temperature gradient from the hills southward into the lowlands where the project is located.[149] These differences can be seen very clearly in satellite images, as in Figure 8 below. The project document itself admits that "*The project area was never inhabited historically, as there are no permanent water sources and it is remote from the hills that formed the traditional location of the Taita populations*"[150] (though the Taita people dispute this). Even though the project area had been gazetted in the 1970s as Private Group Ranches, "*the local population never made use of the project area*".[151] The project refers to "*tragically localized rainfall patterns*" as being a hindrance to successful farming in the project area.[152]

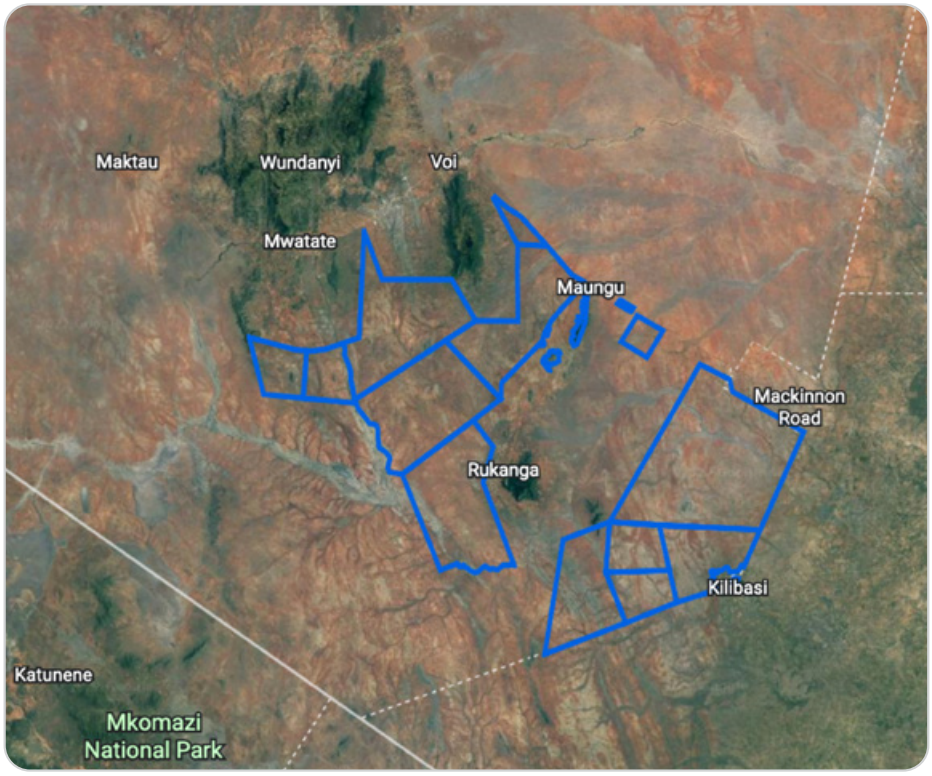


Figure 8:
Satellite image (July 2022)[153] showing project area and adjacent areas

The SSNC study concluded that the reference area used by the project is:

> *"radically different from the Kasigau project area in several respects. Most obviously, at least 100,000 people live in the reference area, while the population in the project area is close to zero. Furthermore, almost all of the identified agents of deforestation – the Taita population, both those that live in the Taita Hills and those that have come down in search for land – live within the reference area. And while many of them live close to the project area, the proximity cannot be said to be the same. The reference area also includes land that has been designated for a variety of purposes, including some agriculture, while the project area is entirely made up of cattle ranches."[154]*

An analysis of the 'comparability' requirements for the project's reference area, as set out in the project methodology VM0009, shows that many of these were not met: the topography is different, the drivers of deforestation are not comparable, the socio-economic and cultural conditions differ, the actual and potential land cover, land use and soil productivity are different, as is the ownership/tenure structure. Whatever the fate of the project area in the absence of the project, it almost certainly would have been very dissimilar from what has happened in the Taita Hills area. Despite this, the company, DNV, which validated the project and then 'verified' its first claim to emissions reductions found that the project "*conforms to the applicability requirements of VCS Methodology VM0009 Version 1.0…[and] also finds that the project proponent has appropriately defined a reference area*".[155]

As with the case for additionality, the counterfactual baseline case seems to rest on a number of blunt assumptions, rather than an analysis that is compliant with the VCS methodology under which the project was developed. The significant difference between the reference areas and the project area would serve to greatly inflate the claimed deforestation threat to the project area, and overstate the extent to which land would be cleared for farming were the project not to take place. The volume of carbon credits issued by the project relies entirely on this implausible, inflated baseline scenario, and thus cannot be assumed to relate to real emissions reductions.

5.2.4. 'Co-benefits'?

In its project document, Wildlife Works places much emphasis on the benefits it is bringing to local people. It has undoubtedly created local employment, such as through a charcoal production business, a tree nursery, carbon measurements, the ecotourism activities and lodge in the Rukinga Ranch Wildlife Sanctuary, as well as the marketing of locally produced soap, arts and crafts (some activities such as the production of cloting, pre-date the project).[156] [157] Whilst this is significant in a region that offers few such opportunities, the local employment Wildlife Works has generated has not really benefited those most affected economically by the project's land use restrictions.

An underlying problem is that most residents do not hold any shares in the 'community ranches' benefitting directly from the project. In exchange for agreeing to manage the ranches in accordance with the REDD project objectives, the shareholder owners of the ranches receive one third of the revenues generated through the sale of carbon credits.[158] However, according to one previous study, "*Most people holding shares in the ranching companies or groups involved in the Kasigau Corridor REDD+ project do not live in the local community; only about 5% of the shares are believed to be held by local residents.*"[159] As a result,

> *"Pastoralists and local residents without land title documents are hardest hit by restrictions the REDD+ project puts on land access, grazing and collection even of dry branches for firewood. Pastoralists and Taita and Duruma communities without land title documents on the one side and ranch shareholders on the other are both laying claim to land that has become part of the REDD+ project".*[160]

In the original 'benefit-sharing' descriptions, a further third of the revenues was earmarked for social and community development projects that are meant to benefit those residents not holding any ranch shares but who are affected by the land use restrictions the REDD+ project imposes. However, a 2016 paper reports that:

> *"realising that the one-third ratio would not work [for Wildlife Works Carbon], the current arrangement is thus: ranch shareholders as landowners get their contractual 1/3 first, because without their legal approval the project would be impossible. REDD+ project costs are covered next, and then the broader community and Wildlife Works split 50% of the profit that remains after these costs have been deducted".*[161]

Hence, the benefits to the non-ranch-owner residents (the majority of the population) were reduced in order to cover the costs of the project. Moreover, ranch shareholders who receive one-third of the revenue from the carbon credit sales might also sit on the "community development committees" that decide how the 50% of the profit from carbon credit sales (i.e., any funding that is still available after deduction of project costs) that is to benefit "the community" not holding shares in the ranches is spent.[162]

Other problems are evident. Whilst the project has created a successful business from charcoal-making (at times important in the project's overall finances), this has come at the cost of restrictions and outright prohibition of traditional charcoal-making activities. Local people are no longer allowed to use even dead branches to make charcoal, or need a permit from WWC to do so. This has fuelled local resentment.

Increases in wildlife populations, especially elephants, which have increased around the Tsavo National Park and may be linked to the project, cause damage to local peoples' crops. There are complaints that neither the Kenya Wildlife Service, responsible for the Park, nor WWC, pay compensation, with people being sent back and forth with their compensation claims until they give up. By contrast, both entities are quick to confiscate livestock found inside the REDD project area, with people then having to pay a 'fine' to have them released.

5.2.5. Conclusions to the case study

The project was clearly not compliant with the requirements of the VM0009 methodology, in respect of how the project presented the case for additionality and in its selection of a plausible baseline. As a consequence of the selection of the reference area, the counterfactual project baseline was exaggerated, and hence carbon credits issued by the project are highly unlikely to represent actual avoided emissions – merely a 'reduction' from a projected level of future forest loss that is highly improbable.

5.3
• Katingan Peatland Restoration & Conservation Project, Indonesia

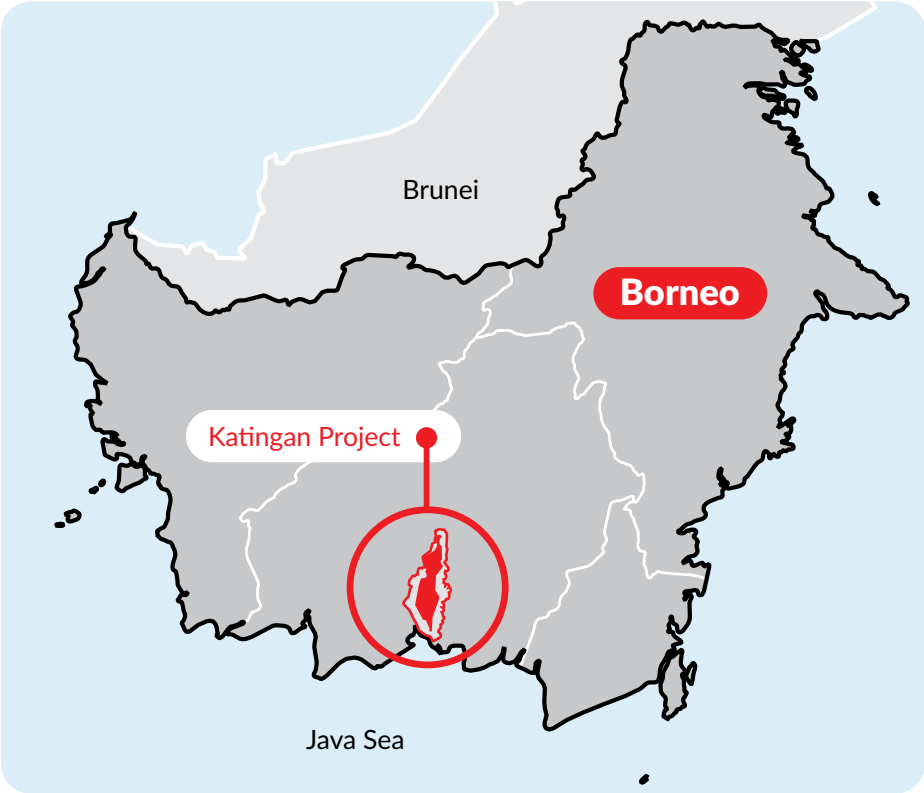


Figure 9:
Location of the Katingan Project on Borneo, in Central Kalimantan Province, Indonesia: Project Zone and Project Area

5.3.1.
Summary of the project

The Katingan Peatland Restoration & Conservation Project is located in Central Kalimantan Province on the Indonesian island of Borneo. It is also known as the Katingan Mentaya Project. In this report, we refer to it as the 'Katingan Project'. Managed by the private company PT. Rimba Makmur Utama (PT. RMU), the project is expected to operate as a carbon offset for 60 years,[163] from 01 November 2010 to 31 October 2070. During this time, the project owner hopes to sell carbon credits which originate from the claim that the Katingan Project prevented the allegedly planned conversion of peatland and swamp forests into acacia plantations on nearly 150,000 hectares that make up the project's Ecosystem Restoration Timber Forest Product Utilization Permit (IUPHHK-RE) concession.

The project's stated aim is to protect and restore the land inside the Ecosystem Restoration concession, which includes the largest remaining intact peat swamp forest in Borneo. The Project Zone (as opposed to the Project Area) covers 305,699 hectares and extends to lands outside the Ecosystem Restoration concessions which include community settlements and agricultural land. Land use emissions in this Project Zone are also considered in the calculation of the volume of emissions allegedly avoided by the Katingan Project.

In the Verra project database, the Katingan Project is listed with the ID-Number 1477 and as having been audited against methodology VM0007 and related methodology modules.[164] This methodology was especially revised to accommodate the Katingan Project, after methodology VM0004 which the project owner had initially used to elaborate the offset project, was no longer accepted by Verra by the time the Katingan Project was ready to submit its project for validation. VM0004 had been the only methodology available for projects based on peatlands. Its discontinuation by VCS / Verra while the Katingan Project was being conceived thus left the project owner without a VCS-approved methodology to generate the carbon credits.[165] Shell has bought approximately 2,960,000 carbon credits from this project.

The Katingan Project webpage on the Verra project database lists 66 documents, several with nearly identical titles, but different dates for the upload on the Verra project database. This includes documents that are central to the assessment of the project, such as the project description, the auditor's validation of the project against the VCS methodology and the first and second verification reports. The documents with more recent dates do not contain a clearly identifiable summary of the changes between different versions of the documents, making the assessment of project documentation very laborious.
A case in point: the documents listed as "2016-May-11 Revised Final PDD_RMU_clean (1).pdf" (upload date: 15/10/2016) and "2016-May-11 Revised Final PDD_RMU_clean.pdf"[166] (upload date: 31/10/2016) are both titled "Project Description" on the cover of the actual document, with the date 11 May 2016 on both documents.

The number of pages (288) and the version (Katingan_ PDD_v1.3) are also identical. A third document with a cover title "Project Description" and the listing title "2016-May-11 Final PDD_RMU.pdf" (upload date: 13/05/2016) has an identical cover page to the two other "Project Description" documents, but contains 291 pages.[167] As no information is provided about the difference in the content of these documents, only a line-by-line comparison of the three 288-291 page documents would reveal what changes have been made between the three versions and whether these are significant to the purpose or carbon calculations of the project. In this report, we refer to the "Project Description" version uploaded on 31/10/2016 and the "Validation Report" version uploaded on 10/12/2021.

The Katingan Project documentation was audited for compliance with Verra's VM0007 by the consultancy SCS Global Services, whose validation report is dated 06 May 2016.[168] The first verification of emissions avoided by the project was also undertaken by SCS Global Services, with the same lead auditor. This first verification covered the project period 01 November 2010 to 31 October 2015; the verification report is dated 14 October 2016[169] and was uploaded on the Verra database on 31 August 2017.[170] According to the Verra registry, the first carbon credits for the project were issued in September 2017, for emissions allegedly avoided during 01 November 2010 and 31 October 2015. 468 carbon credits from this first batch have been "retired for Shell" as recently as June and July 2022.[171] For the most recent crediting period of January to December 2020, auditors signed off on 5,78 million carbon credits that the project owner can sell; this is the largest volume of credits issued per year, up from 1,52 million[172]

carbon credits issued for alleged emission reductions in 2011. In total, auditors have signed off on the issuance of more than 39 million carbon credits for emissions allegedly avoided between November 2010 and December 2020.[173]

5.3.2. Would the land really have been converted to tree plantations?

The basis for the Katingan Project being able to generate carbon credits is the project proponent's claim that without PT. RMU's application for an Ecosystem Restoration Concession license, the Ministry of Forestry in Indonesia would have approved applications to convert the peat swamp forests into acacia plantations: *"[a]t its heart, the project will avoid the deforestation, degradation and drainage of a vast area of peat swamp forest. This is achieved primarily by obtaining the legal licence to the project area, thereby preventing the area from being converted by an industrial acacia plantation company"*.[174]

Elsewhere in the Project Description, more detail is provided about how the application for an Ecosystem Restoration Concession license allegedly prevented the issuance of a licence for conversion of the forests to acacia plantations: *"[i]n 2008, PT. Natural Wood Kencana (deforestation agent A) applied for an industrial acacia plantation concession in the project area covering 50,000ha. Without the Katingan Project, this company would have successfully obtained the concession in 2010."*[175] The only explanation provided for this conclusion is that "*the area was zoned for plantation establishment*" and that "*the pulp and paper industry was on the rise*." In addition, two more companies were "*projected to apply for concessions in 2010, receive reservation letters in 2011 and eventually obtain the concessions in 2012*."[176] Based on these assumptions, the project owners calculate that "*these three companies were assumed to have received licenses for 47,309 ha, 44,837 ha and 57,654 ha within the project area, respectively*."[177]

Two explanations are provided for the start date of the project:

> *"November 1, 2010 is the date when the Katingan Project commenced field survey activities inside the project area, and it also coincides with the time when baseline emissions would have started, had the project not blocked any further applications by reserving the project area applications."*[178]

There are grounds to question this assertion. First, in a recent publication, the company Permian Global which is advising PT. RMU on technical issues and responsible for marketing of the carbon credits (and listed as partner on the Project Description submitted to Verra) presents a chronology that contradicts the statement in the Project Description. While Permian Global writes that "*at least three industrial acacia plantation concession applications would have been made for the project site, if the Katingan Mentaya Project had not intervened with its own application in 2007. Indeed, one industrial acacia plantation company did apply for a concession license on the site in 2008, but was blocked by the Katingan Mentaya Project's pending application, and which prevented further applications from plantation companies*",[179] the Project Description suggests that PT RMU's application only reached a stage

in 2009 where it would have been able to block any other concession application: "*PT. RMU submitted a technical proposal to the Ministry of Forestry in 2008. The application was acknowledged and instructed to proceed with a partial environmental impact assessment of the project area (the status known as SP-1) in 2009, hence blocking any further applications*."[180]

Second, in the section describing the project's activities, the project owner mentions conversion "*by an industrial acacia plantation company*",[181] while elsewhere in the Project Description, the argument is made that a total of *three companies* would have received applications to set up acacia plantations. This may be a minor inaccuracy in the writing of one of the project partners. It may, however, also point to an implausible story of allegedly pending applications for conversion of forests to plantations – for which no tangible evidence apart from a reference to an untraceable letter has been provided in the publicly accessible project documentation.

Third, the chosen start date also seems implausible for two reasons: (1) While the project owners may have undertaken "field survey activities", elsewhere in the project documentation, the project proponents explain that the actual concession license covering the first 100,000 hectares was issued only in 2013; the second concession, covering almost 50,000 hectares, was approved three years later yet, in 2016.[182] (2) Assuming that a competing application for conversion to acacia plantations had been submitted in 2008, it seems highly unlikely that this application for a very substantial area of land would have completed all the necessary field survey activities, raised all the funding necessary to begin operations and received all the necessary permissions to start clearing forests within less than two years, and thus could plausibly have started to release "baseline emissions" by 01 November 2010.

Fourth, even though the area was classified as forest that was eligible for conversion to plantations, as noted in a recent investigative report, the peat swamp areas were not very suitable for establishing acacia plantations.[183]

5.3.3. Implausible assumptions "not in the scope" of the verification assessment

In 2020, Greenpeace Germany published a report that challenges the assumptions in the Katingan Project Description Document. Greenpeace found that the average area of forest cleared to make way for industrial tree plantations in the entire province of Central Kalimantan between 2001 and 2010 was significantly lower than the project developers anticipated in just the project area.

In addition, all of the plantations established in Central Kalimantan between 2001 and 2010 were on mineral soils. The Katingan REDD project area has peat swamp soils, which would need to be drained before they could be planted with acacia trees. This would considerably increase the cost of establishing plantations in the REDD project area. Nevertheless, the project proponents' counterfactual baseline story enabled them to estimate that carbon dioxide emissions would be reduced by an average of 7.45 million tons per year.

The project proponent insists there are threatening signs of deforestation and establishment of tree plantations in areas neighbouring the project. However, this is disputed, as explained below.

One contentious point in relation to the Katingan project's counterfactual baseline and additionality claims is the relevance of a moratorium on new forest developments which the Indonesian government introduced in May 2011, six months after the Katingan offset project notionally began. The possibility of plantation development on a significant area of the carbon offset project land was almost fully eliminated by the moratorium. Despite nearly five years between the moratorium and 2016, when the Katingan project completed its validation and verification process, estimates regarding the amount of alleged carbon emission savings as a result of the project preventing forest clearance inside the project area, were not adjusted by project proponents and the project has issued carbon credits based on an alleged conversion threat to tree plantations within the entire project area – a conversion which is ruled out by the May 2011 moratorium. This has been confirmed in a recent article on the implausibility of assumptions underpinning the Katingan carbon offset project. The article by news outlet Nikkei notes that "the possibility of plantation development has been almost fully eliminated by the moratorium".[184] Nikkei's analysis of data on forest development permits compiled by the Indonesian government also shows that by the time the project began in 2010, the area granted for pulp plantation development had already plummeted. An expert cited in the Nikkei article notes that *"There is [only] one pulp paper concession adjacent to the project area. The concession is inactive."*[185]

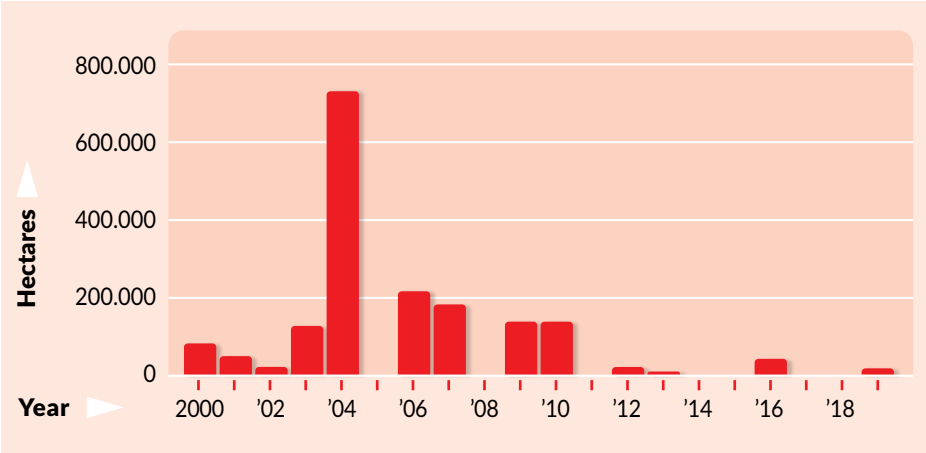


Figure 10:
Ares for pulp concessions approved by year.
(Note: Concessions in peatland areas)

Source: Nikkei, based on Ministry of Environment and Forestry of Indonesia data

An auditor with the company that carried out the validation assessment against the Verra methodology is quoted in the *Nikkei article, stating: "We are required to assess the scenarios and regulations that exist at that time. Since this project has a start date of 2010, we would not have considered regulations that came into place after 2010. While we understand that this was definitely discoverable at the time of validation, it was not in the scope of our assessment services for validation."*[186]

5.3.4. Conclusions to the case study

A Greenpeace Germany Briefing on the use of carbon credits from the Katingan Project by German car manufacturer VW states that the project's "purported emissions savings are based on a chain of questionable assumptions. For example, the business-as-usual scenario (baseline scenario) used to calculate the additionality of the savings is implausible in many instances, and highly unlikely. The project's reference regions, which are intended to provide evidence of additional climate protection, are hundreds of kilometres away, rendering them nearly useless for purposes of comparison. Furthermore, the danger of deforestation through pulpwood plantations throughout the province where the project is located is not nearly as high as outlined by its operators. During the development stage of the business-as-usual scenario, the project stakeholders themselves evidently did not deem the baseline scenario to be very likely and only adopted it once the certification process was initiated. The project area would have been, at least legally, protected from the conversion of forest area to plantations by a national moratorium as of May 2011 – even without the REDD+ project."[187]

Annex 1

- Shell's offset projects

1 Main third-party offset projects currently or apparently intended to supply carbon offsets

	Name	Country	Area (ha)	VCS?	Total credits bought by Shell as of 05/22 (according to Verra database unless otherwise noted)	Date last purchased	Observations
1	**Schleswig Holsteinische Landesforsten - Germany**	Germany	6	N	0		No credits issued from this project yet
2	**Form Ghana**	Ghana	20,000	Y	24,632	24/04/2019	From VCU record: "Retired on behalf of Gazprom Group, for the LNG cargo delivered to Shell"
3	**Tist East Africa**	Kenya		Y			Cook stoves, also CCBS. Could be any one of a number of TIST projects in Uganda and Kenya
4	**Tist India**	India		Y			Cook stoves, also CCBS. No record in the VCU record of how many purchased by Shell.
5	**Kasigau Corridor (Ii)**	Kenya	200,000	Y	927,545	05/09/2018, but last major purchase was 17/04/2017	Kasigau II prog
6	**Southern Cardamom**	Cambodia	497,000	Y	30,239	01/07/2019	Also CCBS. No record in the VCU record for how many purchased by Shell. This quantity was one-off in 2017 "Retired for LNG cargo carbon offsetting on behalf of Toho Gas Co., Ltd. and Sakhalin Energy Investment Company Ltd. for the Green LNG cargo delivered by Sakhalin Energy Investment Company Ltd. . "

	Name	Country	Area (ha)	VCS?	Total credits bought by Shell as of 05/22 (according to Verra database unless otherwise noted)	Date last purchased	Observations
7	**Katingan Mentaya**	Indonesia	149,800	Y	2,955,167	16/01/2019	Includes: "CNOOC Gas & Power Group Ltd., for the 3,338,892 MMBtus of LNG cargo delivered by Shell." "Retirement on behalf of BAOSHAN IRON & STEEL CO., LTD.. Offsetting emissions produced during the manufacturing of LSAW Steel Pipeline (Grade X65MOS) supplied to SHELL Bukom" "3,353,280 MMBtus of the LNG cargo from Oman LNG, delivered by Shell to Shell Energy India" "68,032MT of the LNG cargo from Brunei LNG, delivered by Shell to Osaka Gas Co. Ltd" "Offset emissions related to the LNG cargo number LN21J96NSH25 by Shell to CPC Corporation, Taiwan" "Offset emissions related to the LNG cargo number LN21K14NSH27 by Shell to CPC Corporation, Taiwan" "Retired for Tokyo Gas Co Ltd" "CNOOC Gas & Power Group Ltd., for the 3,609,024 MMBtus of LNG cargo delivered by Shell"
8	**Select Carbon**	Australia		N			"Select Carbon partners with farmers, pastoralists and other landowners to develop carbon farming projects throughout Australia. They have developed and manage a portfolio of more than 70 projects covering 9 million hectares across Australia." Amount of Shell emissions supposedly offset here is not recorded.
9	**Darkwoods Forest Carbon Project**	Canada		Y	18,598	02/04/2020	Area n/a. Shell's VCU purchases are a very small percentage of the total issued.
10	**Greentrees**	USA	48,000	N			Certified by American Carbon Registry
11	**The Conservation Coast**	Guatemala	54,000	Y	542,868	17/01/2019	Also CCBS, and CARB. Seems to have been a one-off purchase
12	**Cordillera Azul**	Peru	1,300,000	Y	3,701,776	04/12/2019	Also CCBS
13	**Tambopata National Reserve And Bahuaja-Sonene National Park**	Peru	570,000	N	462,627	04/01/2018	CCBS. Developed by Althelia. Seems to have been a one-off purchase
14	**Nii Kaniti**	Peru	127,000	Y	266,078	11/07/2019	Also CCBS. Seems to go under various names, called 'FOREST MANAGEMENT TO REDUCE DEFORESTATION AND DEGRADATION IN SHIPIBO CONIBO AND CACATAIBO INDIGENOUS COMMUNITIES OF UCAYALI REGION', Verra project #1360
15	**Promoting Sustainable Farming In Zambia**	Zambia		Y			The project has in fact been generating VCUs since 2018, but the registry does not record any purchases by Shell"
	Sub-Totals		**2,965,806**		**8,929,530**		

2 China afforestation projects

	Name	Country	Area (ha)	VCS?	Total credits bought by Shell as of 05/22 (according to Verra database unless otherwise noted)	Date last purchased	Observations
16	**Xinjiang Makit**	China	6,698	Y	75,853	20/03/2020	
17	**Qinghai**	China	13,862	Y	40,848	12/03/2020	Note: is known as QINGHAI AFFORESTATION PROJECT, #1826 in Verra registry
18	**Puzhen**	China	26,551	Y	70,715	26/11/2020	
19	**Haidong**	China	12,849	Y	16,632	12/03/2020	
20	**Xining**	China	12,874	Y	3,792	12/03/2020	
21	**Xiguan**	China	25,449	Y	103,292	01/04/2014	
22	**Jiangxi Fenglin**	China	14,700	Y			No VCS project matching the Shell description
23	**Saihanba**	China	3,600	N			Credits purchased N/A
	Sub-Totals		**116,583**		**311,132**		

3 'Direct investment' projects

	Name	Country	Area (ha)	VCS?	Total credits bought by Shell as of 05/22 (according to Verra database unless otherwise noted)	Date last purchased	Observations
24	**Staatsbosbeheer**	Netherlands		N	0		
25	**Regenerating Mangroves In Senegal'**	Senegal	4,775	Under vali-dation	0		VCS Project Status: Under validation Estimated Annual Emission Reductions: 95470"
26	**Desa'a Ethiopia**	Ethiopia	1,*,000	N	0		Developed by WeForest, a Belgium-based NGO. This project is not currently generating carbon credits. https://go.shell.com/3zwGHXl
27	**Glengarry**	UK		N	0		Developed by Forestry and Land Scotland, with support from Shell. This project is not currently generating carbon credits.
28	**Queensland Woodland Restoration**	Australia	800	N	0		Developed by Shell's QGC business. The project is expected to generate 90,000 Australian carbon credit units over 25 years.
29	**Reforestation, Castilla Y Leon**	Spain	300	N	0		A forestry project that aims to preserve and extend Glengarry forest, one of the largest remaining areas of native Caledonian pine. The project will plant or regenerate around 1 million trees over five years. Developed by Land Life Company. This project is not currently generating carbon credits.
30	**Tsilhqot'in Reforestation Project,**	Canada	700	N	0		
	Sub-Totals		**7,575**		**0**		

	Total		**3,089,964**		**9,240,662**		
							Percent of total
	Katingan, Cordillera Azul & Kasigau				7,584,488		82,1
	Tambopata National Reserve And Bahuaja-Sonene National Park				462,627		5,0
	Conservation Coast				542,868		5,9
	Nii Kanti				266,078		2,9
					8,856,061		**95,8**

Annex 2

- How ‘verified’ voluntary carbon offset projects are developed: key stages and terminology

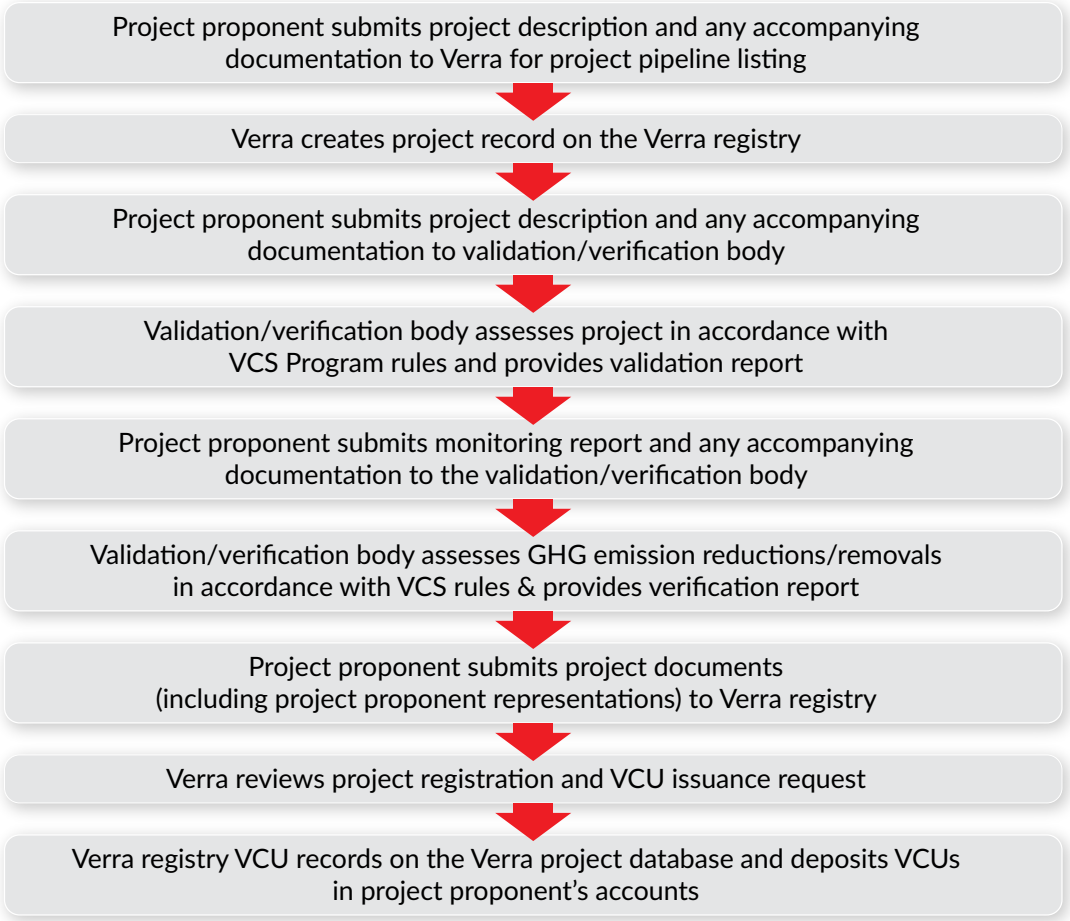


Figure 11:
Verra/VCS Project life cycle and offset credit registration process (adapted from VCS, 2022)

The key steps in the process shown in Figure 11 are:

The project validation is where a third-party (typically a consultancy or certification company) checks that the project is compliant with the methodology that has been used for project development. This does not create carbon credits, but supposedly confirms that the project is compliant with the methodological requirements, and has an appropriate monitoring plan etc.

Project monitoring happens according to a pre-determined plan. The monitoring plans are prepared by the project owner who periodically submits them to the standard system for verification. This happens usually every 1-5 years, depending on how frequently the project proponent wishes to receive new carbon credits for sale. Project monitoring reports contain claims that specific amounts of greenhouse gas emissions have been 'saved', and requests that these are then verified.

Project verification is the stage where an external auditor checks the project monitoring reports. At the start of the project, verification can be carried out by the same organisation that carried out the overall validation of the project. The verification audit is supposed to check if the project is being implemented as described in the validated project document, and, in particular, if the calculation of allegedly avoided emissions or storage of carbon in trees or soils is in accordance with the chosen methodology. If the project is found to be in compliance with the requirement, the verifier typically confirms the amount of carbon savings claimed by the project, thus allowing these to be issued and registered, and to become available for sale as carbon credits.

In practice, these three supposedly distinct phases can conclude more or less simultaneously, especially if there has been a long (indicating 'problematic') process of validation, with the validation report, project monitoring report and verification report all being finalised and entered in the Verra project database within a few days or weeks of each other, as has been the case with the Katingan project in Indonesia.

Notes

1 Rohatyn S, 2022
2 IPCC, 2022a
3 NewClimate Institute, 2022
4 Shell, undated
5 Shell, 2022. §3.2.1.6
6 Shell, 2022. §1.6.2
7 Shell, 2022. §8.5.1 (a)
8 IPCC, 2022a
9 REDD-Monitor, 2019
10 Eni, 2021
11 Eni, 2022
12 Verra, undated d
13 TotalEnergies, 2022
14 TotalEnergies, 2021
15 BP, undated
16 De Haldevang, M, 2022
17 Chevron, 2021
18 Equinor, undated
19 Exxon, 2022
20 IPIECA, 2021
21 Griscom, B. et al, 2017
22 See for example, IPBES/IPCC, 2021
23 See for example, Lang, C and Counsell, S, 2019
24 See for example, Dooley, K, Nicholls, Z, and Meinshausen M, 2022
25 IUCN, 2009
26 Kägi, W. and Schöne, D. 2005
27 UNFCCC, 2006
28 IUCN, 2016
29 TNC, 2015
30 Griscom, B. et al, 2017
31 Griscom B, et al, 2017
32 Carle J and Homgren, P, undated
33 Smith L and Torn, M S, 2013
34 Rohatyn S, 2022
35 See for example, Friedlingstein et al, 2019
36 Dooley, K, Nicholls, Z, and Meinshausen M, 2022
37 Hubau, W., Lewis, S.L., Phillips, O.L. et al., 2020
38 Crusius, J, 2020
39 TNC, 2015
40 Shell, 2019
41 See for example, WBCSD, undated
42 UNFCCC, 2022
43 IPCC, 2018
44 IPCC, 2022a, p1164
45 IPCC, 2022a, p1165
46 IPBES/IPCC, 2021
47 IPCC, 2018
48 IPCC, 2022a, p1164
49 See for example, Griscom et al. 2017
50 See for example, Schenkel, S, 2022
51 ActionAid, undated

52 For a discussion of the risks of soil carbon farming for peasant agriculture, see also Friends of the Earth, 2022
53 See for example, TotalEnergies, 2021
54 See for example, Kroeger, M, 2014
55 IPCC, 2022b, p273
56 IPCC, 2022b, p273
57 Shell, undated
58 Shell, 2019
59 Shell, 2019
60 Shell, 2021
61 ESG Today, 2022
62 This information has mostly been obtained initially from Shell's website (see Shell, undated), but confirmed through other sources, especially the Verra registry (see Verra, undated b).
63 Verra, undated c
64 VCS, 2013b
65 Sandler Clarke, J et a; 2021
66 See for example, HBO, 2022 and the online webportal www.redd-monitor.org
67 BeZero, no date
68 These include the Voluntary Carbon Markets Integrity Initiative (VCMI – https://vcmintegrity.org/), the Integrity Council for Voluntary Carbon Markets (icvcm – https://icvcm.org/who-we-are-all/)
69 CLARA, 2022
70 A short video by the remote sensing scientist, Eliasw Ayrey, explaining '21 ways that carbon projects cheat' is available here; https://bit.ly/3pp3C0F
71 Archer, D, 2016
72 Crusius, J, 2020
73 Welch, D, 2012, cited in SSNC, undated
74 See for example, Counsell, S, 2021
75 See for example, Ayrey, 2022
76 Hodgson, C 2021
77 Verra undated a
78 VCS, 2013b
79 CIMA, 2012, p17
80 CIMA, 2012, p60
81 Minsterio del Ambiente, 2012
82 Hill, D, 2022
83 CIMA, 2012, p184
84 The Field Museum, 2002
85 Hill, D, 2002
86 INRENA, 2006
87 INRENA, 2006, p187
88 CIMA, 2012. P80
89 Hill, D. 2022
90 CIMA, 2012, p60
91 Mora, A, 2014
92 CIMA, 2012, p81
93 WWF, 2019
94 Hill, D, 2022
95 Berghofer, A et al, 2017
96 CIMA, 2012, p79
97 CIMA, 2012, p81
98 CIMA, 2012, p121
99 CIMA, 2012, p73

100 USAID, 2013
101 CIMA, 2012, p81
102 Hill, D, 2022
103 CIMA, 2012, p9
104 VCS, 2018, p18
105 Andes-Amazon Fund, 2021
106 CIMA, 2012 p84
107 CIMA, 2012, p93
108 CIMA, 2012, p89
109 INRENA, 2006
110 CIMA, 2012, p91
111 Wikipedia, undated
112 CIMA, 2012, p113
113 CIMA, 2012, p112
114 CIMA, 2012 p84
115 CIMA, 2012, p123
116 CIMA, 2012, p133
117 See for example, Elbein, S, 2015
118 VCS, 2018, p24
119 See for example, CIMA, 2012, p33
120 CIMA, 2012, p9
121 Hill, D, 2021.
122 FPP, 2021
123 FPP, 2021
124 Amasifuen, R et al, 2021
125 FPP, 2022
126 Wildlife Works, 2011, p1
127 Verra, undated a
128 Wildlife Works, undated
129 Wildlife Works, 2011, p4
130 Wildlife Works, 2011
131 A map of the project area included in a late draft of the project document (but not in the final version) described the entire project area as 'non-forest' (see Wildlife Works, 2011b), and the 'classification' of the area as 'forest' seems to rest on a Kenyan government decision to adopt a definition of forest as having as little as 15% tree canopy cover, compared to the typical UN definition of at least 30% cover.
132 Wildlife Works, 2011, p6
133 SSNC, undated
134 VCS/Wildlife Works, 2010, p55
135 Wildlife Works, 2011, p6
136 VCS/Wildlife Works, 2010, p31
137 VCS/Wildlife Works, 2010, p32
138 VCS/Wildlife Works, 2010, p32
139 DNV, 2011, p11
140 VCS/Wildlife Works, 2010, p55
141 VCS/Wildlife Works, 2010, p55
142 SSNC, undated
143 SSNC, undated
144 VCS/Wildlife Works, 2010
145 Teucher, M. et al, 2020
146 Wildlife Works, 2011, p110
147 Pellikka, P.E. et al, 2009
148 Pellikka, P.E. et al, 2009
149 Mwalusepo, S, et al, 2016
150 VCS/Wildlife Works, 2010, p24

151 VCS/Wildlife Works, 2010, p24
152 Wildlife Works, 2011, p24
153 GFW, 2022
154 SSNC, undated
155 DNV, 2011, p14
156 Kill, J, 2016
157 SSNC, undated
158 Kill, J, 2016
159 Kill, J, 2016
160 Kill, J, 2016
161 Githiru, M, 2016
162 Kill, J, 2016
163 Equivalent to the duration of the Ecosystem Restoration Concession, which is extendable to 100 years
164 Verra, undated i, Katingan Extension Request 28 Oct 2015
165 A VCS exemption letter dated 28 October 2015 states that "once the ERC [Ecosystem Restoration Concession] license was granted the methodology that was originally proposed for use the project, VM0004, was no longer valid for use under the VCS Program due to updated [sic] made to the VCS' AFOLU requirements. As VM0004 was the only methodology approved that included REDD activities in peatlands, there was no methodology available for the project to use. In response, the VM0007 methodology was revised to include the project activities included in the Katingan project. This revision to the VM0007 methodology to include REDD activities on peatland was not approved by VCS until 9 March 2015." VCS, 2015
166 VCS, 2016a
167 The three additional pages being the "PDD cover" for the second certification obtained by the Katingan Project, against the Climate, Community and Biodiversity standard, also managed by Verra
168 Two copies of the validation report, with identical cover, page numbering and total number of pages (67) but different upload dates are posted on the Verra project database. This report refers to the validaiton report uploaded on 10.12.2021.
169 The file name, however, includes the date 18 May 2017 ("_051817.pdf"), and page 22 of this first verification report notes that the table on that page "was updated on 18 may 2017, as the table was populated with erroneous baseline and project emission values." VCS, 2016
170 Verra, undated h
171 Verra, undated h
172 The exact figures are 5,787,786 for the 2020 issuance and 1,527,114 for 2010/2011
173 All figures from the verification reports for the respective years, available at Verra, undated i
174 VCS, 2016a: 30
175 VCS, 2016a: 99. The only reference provided for the claim that PT. Natural Wood Kencana had submitted an application for conversion of the peat forests to acacia plantations is the mention of a "Letter No. 04/TOR/CEO/X/2008 dated October 23, 2008" without any further links or explanation why this letter could be taken as evidence for a successful application in a multi-step process of granting of a suit of licenses needed for such a conversion.

176 VCS, 2016a: 99
177 VCS, 2016a: 99
178 VCS, 2016a: 29
179 Permian Global, 2021
180 VCS, 2016a: 29
181 VCS, 2016a: 30
182 Verra, undated i
183 Nikkei, 2021
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