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Exploring Intersections of Trafficking in Persons Vulnerability and Environmental Degradation in Forestry and Adjacent Sectors

*Case Studies on Illicit Harvesting of Pterocarpus Tinctorius
and Road Construction in Mozambique*

August 2020

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Acronyms

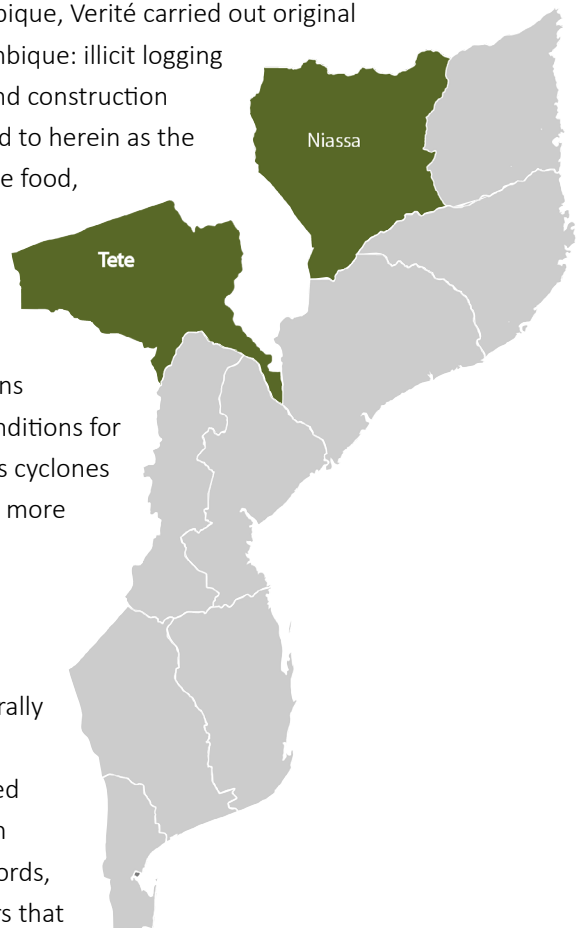
AAC:	Annual Allowable Cut
AfDB:	African Development Bank
ANE:	National Road Administration
DINAF:	National Directorate of Forests
DUAT:	<i>Direito do Uso e Aproveitamento de Terra</i> – similar to a land title
EIA:	Environmental Investigation Agency
ESF:	Environmental and Social Framework
ESIA:	Environmental and Social Impact Assessment
ESMP:	Environmental and Social Management Plan
FDI:	Foreign Direct Investment
FL:	Forced Labor
FRELIMO:	Mozambique Liberation Front
GDP (PPP):	Gross domestic product based on purchasing power parity
ICLS:	International Conference of Labour Statisticians
IFFs:	Illegal Financial Flows
IFI:	International Finance Institution
IIED:	International Institute for Environment and Development
ILO:	International Labour Organization
J/TIP:	U.S. Department of State’s Office to Monitor and Combat Trafficking in Persons
JICA:	Japan International Cooperation Agency
MITADER:	Ministry of Land, Environment, and Rural Development
MOPWH:	Ministry of Public Works and Housing
MZN:	Mozambique currency
NDVI:	Normalized Difference Vegetation Index
NGO:	Non-governmental Organization
NTFPs:	Non-timber Forest Products
NUIT:	Single Tax-Payer Identification Number
ODTS:	Organic Dust Toxic Syndrome
PIT:	Project Implementation Team
RAP:	Resettlement Action Plan
RENAMO:	Mozambican National Resistance
SDI:	Spatial Development Initiative
TIP:	Trafficking in Persons
UNODC:	United Nations Office on Drugs and Crime
WGI:	World Governance Indicator

Executive Summary

Stakeholders in the spheres of human rights and development have contributed literature describing how the use of exploited labor – including labor as the result of human trafficking – can contribute to deforestation. There is a parallel field of literature that documents the impacts that environmental degradation and deforestation can have on human populations. What both of these spheres lack, however, is documentation of the specific patterns of labor exploitation, human trafficking, and child labor experienced by workers directly involved in forestry and/or adjacent sectors, as well as the means by which deforestation can create vulnerabilities to human trafficking.

To ground an understanding of the intersection of human vulnerability and deforestation within the specificities of the political, social, and economic contexts of Mozambique, Verité carried out original research case studies in two sectors linked to deforestation in Mozambique: illicit logging of *Pterocarpus Tinctorius* (known locally as *Nkula*) in Tete Province and construction of the Cuamba–Mandimba–Lichinga section of the N13 road (referred to herein as the N13 Project) in Niassa Province. The Mozambican forests that provide food, firewood, employment and protection for farmland are disappearing at a rate of over 80,000 hectares (198,000 acres) per year.¹ An estimated nine percent of Mozambique’s forest cover has been lost since 2000.² The loss of these forests creates and compounds hardships for the people of Mozambique, particularly rural populations facing severely limited employment and livelihood opportunities. Conditions for rural populations are further deteriorated by natural disasters such as cyclones and flooding, which are likely to worsen as weather patterns become more extreme.

In both case studies, Verité conducted interviews with workers and expert informants, triangulating information with thorough literature reviews. A qualitative approach to this research, undertaken by culturally competent researchers, allowed for holistic description of the nature of risk of trafficking in persons (TIP) and associated indicators of forced labor, as well as other labor abuses such as child labor. This approach allowed interviewed workers and experts to describe, in their own words, the factors that push workers to seek jobs in these sectors, the factors that



LOCATION OF CASE STUDIES - TETE AND NIASSA REGIONS, MOZAMBIQUE

compel them to accept exploitive working conditions, as well as the intersections between resultant environmental degradation and prospects for their communities' well-being and resilience. The

According to a United Nations Office on Drugs and Crime [...], rosewood accounted for 35 percent of all wildlife seizures, the highest proportion of any wildlife product.

following document presents a summary of these findings. This research in Mozambique is part of a larger Verité exploratory project to examine the intersection between environmental degradation and vulnerability to trafficking in persons and other labor abuses through a set of case studies in different sectors and geographies.

Illicit Harvesting of *Pterocarpus Tinctorius* in Tete Province

Pterocarpus Tinctorius – referred to locally as *Nkula*, or sometimes as *Mkula* or *Mukula* – is a species of wood native to Tete Province. *Nkula* has historically been used by local communities for charcoal and firewood. However, consumer demand on the international market for rosewood, a genus of trees with brownish or reddish hues that *Nkula* closely resembles, has driven commercial harvesting of *Nkula*. Rosewood and lookalike species are highly trafficked. According to a United Nations Office on Drugs and Crime (UNODC) database of global wildlife seizures from 2004-2015, rosewood accounted for 35 percent of all wildlife seizures, the highest proportion of any wildlife product.³

Harvesting of rosewood and lookalike species has boomed in miombo forests in many countries in the Congo river basin. Once the species is exhausted in one country, trading networks leapfrog to neighboring countries. A “boom and bust” cycle sees steep rises in harvest and export volumes from individual countries before a sudden collapse, or “bust.” High market prices enable unsustainable harvesting and habitat destruction, accompanied by corruption and violence by and against enforcement officers and community members. As demand spikes and market prices for these species rise correspondingly, unsustainable harvest practices – often associated with corruption and community violence – have led to deforestation and habitat destruction. In the case of Mozambique, the logging, collection and export of *Nkula* was banned in 2018.⁴

Field data collection for illicit logging of *Pterocarpus Tinctorius* timber in Tete Province was conducted in the districts of Macanga and Marávia between March and April 2019. A total of 44 interviews were conducted in Tete Province, including 15 forestry workers, two simple license holders, two forest technicians, 10 concession holders, and 15 experts from academic or civil society backgrounds.

Verité's field research in Tete Province found a variety of exploitative working conditions present among workers in the **illicit extraction of *Nkula* timber**, some of which were indicative of forced labor. For more information on labor risk findings, see the **Findings on Labor and Other Vulnerabilities for Workers in Illicit Harvesting of *Pterocarpus Tinctorius*** section. Labor risk findings are summarized below:

- **Deceptive recruitment:** Workers may have experienced deceptive recruitment around several features of work. To some degree, this deceptive recruitment was incentivized by the need to staff up quickly to capitalize on consumer demand for *Nkula*. Some timber workers reported deception around the legality of work, noting that they had been told that *Nkula* was a legal species and they should not be afraid to work. The impact of this deception was compounded if the illicit status of work was used to silence worker grievances, as described below. Operators of the commercial company with a legal concession elsewhere in Mozambique reportedly used deception to transfer some workers from that concession to the illicit operations in Tete. In addition to deception around the legality of logging activities, workers interviewed reported consistent deception around other working conditions, most notably around levels of earnings and how earnings would be calculated.
- **Wage withholding and underpayment:** Multiple types of timber workers in Tete reported that they were not fully informed that their wage rate would be dependent on the size of the log harvested. For some – particularly transnational migrants – this led to wage rates that were so low on average that workers could not afford necessities like food. Seasonal timber workers employed by the commercial company with a legal concession elsewhere in Mozambique stated that they feared retaliation from supervisors if they were to bring a dispute regarding payment. Workers supplying traders with logs (as described in scenarios two and three above) also experienced wage withholding and underpayment of wages; in these cases, interviewed workers testified that the hope of ultimately receiving payment could keep some workers working after a history of under- or non-payment, particularly in the face of a lack of alternative livelihood options.



- **Excessively long hours:** Typical hours for general laborers and timber workers were reported at 10-14 hours per day, with hours rising to 17 hours per day during peak periods. In busy periods, work could be required overnight, and refusal to work the required overtime could result in termination.
- **Serious health and safety risks without protective equipment:** *Nkula* workers in Tete who participated in log peeling were vulnerable to respiratory disease and reported symptoms including cough, fever, and general malaise. With the exception of workers with a formal employment relationship to the commercial logging company, workers were not provided with adequate protective equipment.
- **Threats of denunciation as a means to control and coerce workers:** Workers engaged in *Nkula* logging were sometimes threatened with denunciation to the police. This threat represented a realistic scenario due to impressions of corruption among local law enforcement agents. It was particularly leveraged against migrant workers, who feared deportation. In some cases, workers were reportedly physically assaulted by police or threatened with arrest. Most workers interviewed suggested corruption among local law enforcement, expressing the belief that the police would protect Chinese or Mozambican traders and not the workers.
- **Abuse and harassment:** Abuse and harassment of workers was not uncommon, particularly as a means to suppress grievances. Interviewees who worked for traders reported that any expression of disagreement, particularly around earnings, could be met with a suggestion to quit the job. Workers for the commercial logging company reported some instances of physical abuse from a supervisor as a form of discipline for being late. One interviewee reported being aware of a case of sexual harassment. Cases of sexual harassment by construction company managers toward female workers have also been reported in the Mozambican media.⁵
- **Child labor:** Interviewees reported having observed children participating in peeling logs in timber yards controlled by the commercial logging company. Children were reported to range in age from 14 to 18, with some interviewees reporting children they believed to be as young as 12. These children were witnessed working without safety equipment. The scale of children engaged in logging activity is not known and warrants further investigation. Children participating in log peeling were likely to experience even more significant health risks than adults, including respiratory disease. Community-based organizations interviewed reported that most children engaged in logging were driven to the work by the

CHILDREN PRESENT AT *NKULA* HARVESTING SITE, MOZAMBIQUE



Community-based organizations interviewed reported that most children engaged in logging were driven to the work by the intense poverty experienced by their families, as well as lack of nearby schools. There were isolated reports of children [...] living in severely poor conditions without the presence of any adult caretakers.

intense poverty experienced by their families, as well as lack of nearby schools. There were isolated reports of children known to be involved in log peeling in an area of Tete Province near the Zambian border. These children were reported to be living in severely poor conditions without the presence of any adult caretakers.

In addition to these labor findings, several findings relating to intersections with environmental and social factors were also identified. Methodologies employed in partnership with the Rights Lab at the University of Nottingham to evaluate tree cover loss in the study area generated findings that support suspicions of loss of productive and protective forest functions. Regarding *Nkula* specifically, photographs taken during field research were shown to conservation experts who indicated that the small diameter logs may indicate depletion of the species in case study areas. This temporal dimension of tree loss was further supported during worker interviews:

Those who had been working in forest sector activities for between 18 months and two years indicated higher and more timely payments around 2016 than at the time of interviews in 2019, which could be due in part to depletion of the species, as well as increased regulation and protection of *Nkula* starting in 2016 and the eventual ban on logging, collection and export of *Nkula* in 2018.⁶

While the precise impacts of deforestation in the region have not yet been quantified, it is likely that the loss of tree cover will contribute to soil erosion and water table instability, worsening the impacts of future storms and cyclones. The impacts from deforestation – and associated increased impacts of storms – will continue to interfere with subsistence agriculture and disrupt the livelihoods and food security of local communities. The links between forest and environmental degradation and vulnerabilities to further poverty require further study. However, some immediate potential impacts on food insecurity are clear, as Tete is one of the most food-insecure areas in Mozambique and has a very long ‘lean season’ (when own-produced food stocks become increasingly depleted in the months leading to harvest time). The report from the Rights Lab can be found in an annex to this report.

Corruption and weak governance are underlying factors common to both trafficking in persons vulnerability and the risk of environmental degradation. The logging operations studied were able to circumvent proper licensing procedures and thereby to evade oversight, allowing employers and/or supervisors to continue to exploit workers – including children in some cases. When workers sought to express grievances, a combination of perceived corruption and a lack of capacity amongst local

A STREET SCENE IN TETE PROVINCE



Svetlana Arapova

law enforcement officials meant that workers had no recourse in the case of abuses. In fact in some cases, rather than being viewed as victims, workers risked being prosecuted as perpetrators should illicit activities draw the attention of law enforcement, further deterring workers from expressing any grievances about their work.

Corruption and lack of adequate oversight also allowed logging operators to access land in the first place, despite many instances of longstanding community use. Logging operators were reportedly able to gain access to community land via deals negotiated with elite members of the community, which did not necessarily reflect the wishes or needs of the broader community.

The resulting deforestation has the potential to contribute to displacement of local communities. Nearly all interviewed workers stated that that logging was one of the few options for them to earn an income. Some workers who had access to land were also able to support their families with

Stakeholders with broader environmental and governance agendas could likely benefit from a strategic consideration of how integration of labor and social concerns could support progress towards their primary missions.

subsistence farming, but many workers did not have access to land sufficient to provide food security. Due to a lack of livelihood options and reliance on subsistence agriculture, local communities are particularly vulnerable to environmental degradation and the impacts of extreme weather events, which can be worsened by deforestation. Like community members already impacted by Cyclones Idai and

Kenneth, increasing numbers of people will be pushed into risky or exploitative work locally – including potentially in illicit logging – or they will have to migrate elsewhere to survive.

The case study also highlights the degree to which shifting consumer demand necessitates the rapid development of new social and environmental frameworks around the harvest and exploitation of individual species – including those previously absent from conservation agendas. Prior to the recent explosion of exploitation following “busts” in harvest of related species in the region, *Nkula* was not previously harvested in any notable amounts, and so was not included in earlier government efforts at mapping distribution and volume of commercial tree species. *Nkula* harvesting was not banned until 2018 in Mozambique and was only recently listed (in fall 2019) as an “Annex 2 species” under CITES.⁷

Finally, in the course of expert consultations to inform and validate findings, Verité researchers found that while there are rich communities of experts focusing on specific relevant issues such as deforestation/environmental degradation, corruption, governance, and land rights, these stakeholders do not always coordinate their agendas between themselves. More notably for the purposes of this research, a focus on labor rights was typically absent from these conversations. Where a labor rights or an anti-trafficking perspective is present, it may not adequately integrate

broader issues of governance and the environment. Similarly, stakeholders with broader environmental and governance agendas could likely benefit from a strategic consideration of how integration of labor and social concerns could support progress towards their primary missions. For more, see the [Recommendations](#) section.

Road Construction in Niassa Province

Verité's second case study examined the intersection of labor vulnerability and environmental degradation in the construction of the Cuamba–Mandimba–Lichinga section of the N13 Highway in Niassa Province, part of the Nacala Development Corridor. Field research for road construction in Niassa Province was conducted between March and April 2019, in the districts of Cuamba, Lichinga, and Mandimba. A total of 45 stakeholders were interviewed, including 15 former or existing road workers (some of whom originated from other provinces such as Nampula and Sofala), 21 Project Affected Persons (PAPS), six civil society representatives, and three local government representatives.

The Nacala Development Corridor is an agreement between the countries of Tanzania, Mozambique, Malawi, and Zambia to develop and improve transportation infrastructure linking the four countries. The Development Corridor is primarily funded by the African Development Bank (AfDB), the Japan International Cooperation Agency (JICA), and the Government of Mozambique, with foreign private sector contractors primarily overseeing the implementation.

The remote Niassa Province in Mozambique is an area rich with natural resources – including the Niassa National Reserve, one of the largest protected wildlife areas in Africa – with large swaths of miombo forests alongside minerals and mining opportunities. At the same time, the relatively small local population – Niassa is the least populated province in the country – has struggled with a poverty rate that increased from 33 percent to over 60 percent between 2009 and 2015.

A SECTION OF THE N13 ROAD, NIASSA PROVINCE



Niassa's compelling wealth of natural resources and relative underdevelopment has made it a prime target for foreign investment and infrastructure development. Infrastructure projects, while potentially providing valuable economic growth opportunities, can also contribute to negative social and environmental impacts for surrounding communities.

In an attempt to mitigate these impacts, international donors such as the World Bank have designed a suite of “donor safeguards” or policies for due diligence that are intended to “identify, avoid, and minimize harms to people and the environment.”

Despite these donor measures, research among road construction workers on the N13 Project in Niassa found evidence of labor abuse. These included a number of indicators of trafficking in persons, in the form of deception about the nature and conditions of work (primarily wage levels, hours and job tasks); work for very low wages; and abuse and harassment; as well as evidence of violation of a range of social and labor protection standards. For more information on labor risk findings, see the **Findings on Labor and Other Vulnerabilities for Workers on the Cuamba–Mandimba–Lichinga N13 Project** section. Labor risk findings are summarized below.

- **Deception regarding terms of employment.** Verité research found evidence of employer deception regarding workers' terms of employment; this was found in both the formal and informal recruitment and hiring processes involved in road construction. The constant movement of road crews meant that newly hired workers had little opportunity to vet actual working conditions. Workers were widely promised higher wages or raises that never materialized. Some workers were promised housing or subsidies for housing, which was not provided and therefore left them with significantly less ability to save money than anticipated. Many reported that they were given inaccurate information about the tasks for which they would be responsible.
- **Lack of contracts.** Workers interviewed typically did not receive contracts until well after beginning their jobs or did not receive contracts at all. When these contracts were received, they typically did not contain relevant details such as salary information.
- **Low wages.** Monthly wages were reportedly low for general laborers and appeared to stretch the limits of legality. Despite a national minimum wage of MZN 6,135 (USD 92.95) per month for the construction sector,⁸ the majority of general laborers interviewed were provided with monthly wages of 2,000 – 6,000 MZN (USD 30 – 90). No workers interviewed knew how their wage was calculated, and workers often lacked clear and objective wage benchmarks.
- **Deductions and financial penalties.** Roughly a quarter of interviewees described some type of deduction from their pay that reduced their already low wages. Deductions were reportedly taken for disciplinary infractions such as “not working well,” “talking too much,” “voicing complaints,” “unhappiness,” “upsetting [a] superior,” and for alleged damage to materials.
- **Long hours and involuntary overtime.** Workers reported frequent weekend work, including work on Sundays with a threatened penalty of termination for non-compliance. Due to regular requirements for Saturday and Sunday work, many workers worked multiple seven-day weeks per month. Workers also reported that they were expected on a daily basis to accept any task

assigned and see it through to completion, regardless of hours required, or face termination. Many workers did not receive overtime rates for additional work.

- **Health and safety risks.** Road construction workers interviewed were exposed to several risks to health and safety, with the majority lacking access to potable water while working on remote sections of road, which contributed to dehydration in extreme cases. Despite a range of hazards including the risk of falling objects; handling of hazardous materials such as mercury, tar, and cement; and exposure to MC-30 (a chemical used in asphalt application that exposes workers to hazardous vapors and potential skin damage);⁹ the provision of personal protective equipment was inconsistent, with some workers receiving some equipment and others not receiving any. Over a third of workers cited hunger and lack of access to water as a significant issue during the workday.
- **Abuse and retaliation.** Over half of interviewees had witnessed or experienced physical violence perpetrated by supervisors. Workers stated that physical violence could be a reaction to a number of worker behaviors, including resting, asking for rest, not following instructions, or not understanding instructions because of language barriers. Workers expressed fear that they would be terminated in retaliation for expressing grievances to supervisors or law enforcement.¹⁰
- **Illegal HIV testing.** Mandatory HIV testing as a condition of hiring was reported by some workers interviewed, in contravention of the policies of project lenders and Mozambican law.¹¹
- **Lack of labor inspection and oversight.** Road construction workers reported insufficient labor inspection and follow up; some workers alleged that labor inspections were rarely conducted, and that labor inspectors received bribes from the construction company management. In some cases, police and community leaders were also seen as neglecting to protect workers and residents or colluding outright with private sector interests. Complaints against the company were reported to have “disappeared” at various stages of grievance processes.

The N13 road passes through settled communities, and its construction has affected structures and other community areas such as houses, chicken coops, maize storage buildings, agricultural fields, and planted trees. In terms of effects of road construction on forest cover, an analysis of geospatial data in partnership with the University of Nottingham’s Rights Lab found significant negative response in “greenness” for areas connecting Lichinga to Mandimba in all of the buffer zone distances adjacent to the road; that is, the loss of tree cover was apparent. This was corroborated by community informants in areas along the road, who reported that when acacia trees were cut to make space for the road, areas became “like deserts,” and surrounding areas experienced soil erosion and increased winds – leading some households to lose their roofs. Community informants also perceived that the loss of pine trees had contributed to warming temperatures on a local level. Furthermore, community members had not witnessed adequate attempts to plant seedlings to reforest the area.

During field research, several interviewees noted that the growth of the road might further facilitate the expansion of natural resource extraction such as logging, illegal mining, and wildlife poaching in surrounding areas. Geospatial analysis did indicate rapid development in the evaluated areas of Niassa along the N13 road construction corridor, including mining activity and informal settlements, suggesting a potential change in the livelihood resources and patterns of local populations.

Although a resettlement plan was prepared,¹² interviews with community members indicated that many citizens had not been previously aware that road development might necessitate resettlement. Researchers were able to ascertain that some households affected by the project did secure some level of compensation, while others were not compensated at all. A key issue cited by community members interviewed was a gap in Mozambican law specifying what qualifies as just compensation for parties impacted by public works projects such as road development.

The loss of property, livelihood, and food security created by this project can contribute to worker vulnerability to labor abuses. One worker displaced by the project was explicitly offered employment on road crews as compensation for detriment to his livelihood; others discussed the pressure to seek employment in road construction due to loss of alternative livelihoods. Despite these negative impacts, some community members interviewed perceived the road development as an overall positive factor for the area, noting improved transportation and economic development opportunities such as increased access to market for agricultural products.

Verité has prepared a set of recommendations intended to address and advance better labor outcomes in the road construction sector, and specifically for the construction of the N13 highway in Niassa Province, with specific recommendations for the Government of Mozambique, International Finance Institutions (IFIs), and Contractors. For more, see the **Recommendations** section. Labor and human rights violations can persist deep in supply chains, hidden even from social compliance and government enforcement programs. It is vital that these stakeholders take urgent action to combat these risks.

CONSTRUCTION OF THE CUAMBA–MANDIMBA–LICHINGA SECTION OF N13, NIASSA PROVINCE



Estacio Valoi

Introduction

This report presents findings from two case studies conducted in Mozambique as part of a larger exploratory research project undertaken by Verité in 2018-2019 with generous funding from the U.S. Department of State's Office to Monitor and Combat Trafficking in Persons (J/TIP), with the aim of examining the linkages between environmental degradation and vulnerability to trafficking in persons (TIP) and other labor abuses.

While these linkages have been noted previously,¹³ a detailed research base on the nature and mechanisms of the connection is lacking, as well as clear intervention points for specific sectors and examination of the potential for collaboration or integration between the spheres of environment and labor. Verité's exploratory research has aimed to contribute to this knowledge gap through a set of case studies in different geographic locations, sectors, and contexts to illustrate potential links between environmental degradation in the context of active deforestation and vulnerability to TIP and other labor abuses.

The project had three primary objectives:

- **Develop an analytical approach** for examining and documenting the relationship between TIP and environmental degradation in forests and adjacent sectors.
- **Conduct qualitative, comparative research** in deforestation hot spots that examines and documents the relationship between environmental degradation and TIP risk.
- **Build awareness of the connection** between forest-linked environmental degradation and TIP both in relevant geographies and topical civil society networks.

Two countries were identified for research, Burma and Mozambique, based on the following criteria: large volumes of export of tropical roundwood; high rates of deforestation; environmental degradation; evidence of illegal logging; potential for TIP risk; a lack of existing research on labor in forest and adjacent sectors; and feasibility and safety of access to research locations. Two case studies were then selected within each country. In Mozambique, research focused on illicit logging in Tete Province and road construction in Niassa Province. In Burma, case studies were conducted on banana cultivation in Kachin State and small-scale informal logging in northern Burma. These case studies were selected to provide a diverse set of illustrative examples of potential intersections between labor vulnerability and environmental degradation building on previous J/TIP-supported frameworks for assessing country- and sector-based risk for trafficking in persons.¹⁴

The Mozambican forests that provide food, firewood, employment and protect farmland are disappearing at a rate of over 80,000 hectares (198,000 acres) per year.¹⁵ An estimated 9 percent of Mozambique's forest cover has been lost just since 2000.¹⁶



BURMA



MOZAMBIQUE

Despite supportive land and forest law, there has been no associated de facto changes in forest exploitation. Conditions for rural populations are further deteriorated by natural disasters such as cyclones and flooding, which are likely to worsen as weather patterns become more extreme. While environmental degradation and overall human vulnerability have been well-documented, there is less understanding on how the two forces intersect in specific contexts.

To ground an understanding of these dynamics within the specificities of the political, social, and economic contexts of Mozambique, Verité carried out original research case studies in two sectors linked to deforestation in Mozambique: illicit logging in Tete province and large-scale road construction in Niassa province. In both case studies, Verité conducted interviews with workers and expert informants, triangulating information with thorough literature reviews. A qualitative approach to this research, undertaken by culturally competent researchers, allowed for holistic description of the nature of relevant risk of TIP and associated forced labor, as well as other labor abuses, and the relationship of those abuses to the local environmental context encountered by communities. It allowed interviewed workers and experts to describe, in their own words, the factors that pushed them to seek their jobs, the factors that compelled them to accept exploitive working conditions, and the links to implications of environmental degradation on their community's survival.

Case Study Locations

In both case studies, research highlighted the contextual factors that have enabled both deforestation and labor abuses resulting from these sectoral activities, creating a cycle of continued environmental and human vulnerability. While the specific working conditions and environmental factors identified in each case study vary, both case studies highlight vulnerable rural populations lacking viable employment or livelihood opportunities, driven by survival to accept work with exploitative conditions. The vulnerability and desperation of these workers, as well as individuals in surrounding communities, has been further heightened by forest loss and concomitant environmental degradation. Impacts on soil and water quality limit prospects for subsistence and small-scale agriculture, a previous pillar of food security and basic livelihood provision. The bind facing these rural populations then tightens further: to survive, they must accept poor labor conditions in existing sectors, likely further contributing to environmental degradation, or attempt to migrate to other regions or countries, facing the well-documented host of risks inherent in labor migration.

Methodology

Conceptual and Analytical Framework

There is an emerging consensus that environmental degradation, and deforestation more specifically, is linked to trafficking in persons. However, preliminary research for this study pointed to a lack of evidence tied to specific geographic and sectoral contexts as well as a lack of documentation regarding which specific labor rights abuses and indicators of forced labor might be present for workers.

Researchers framed several related questions for exploration, including:

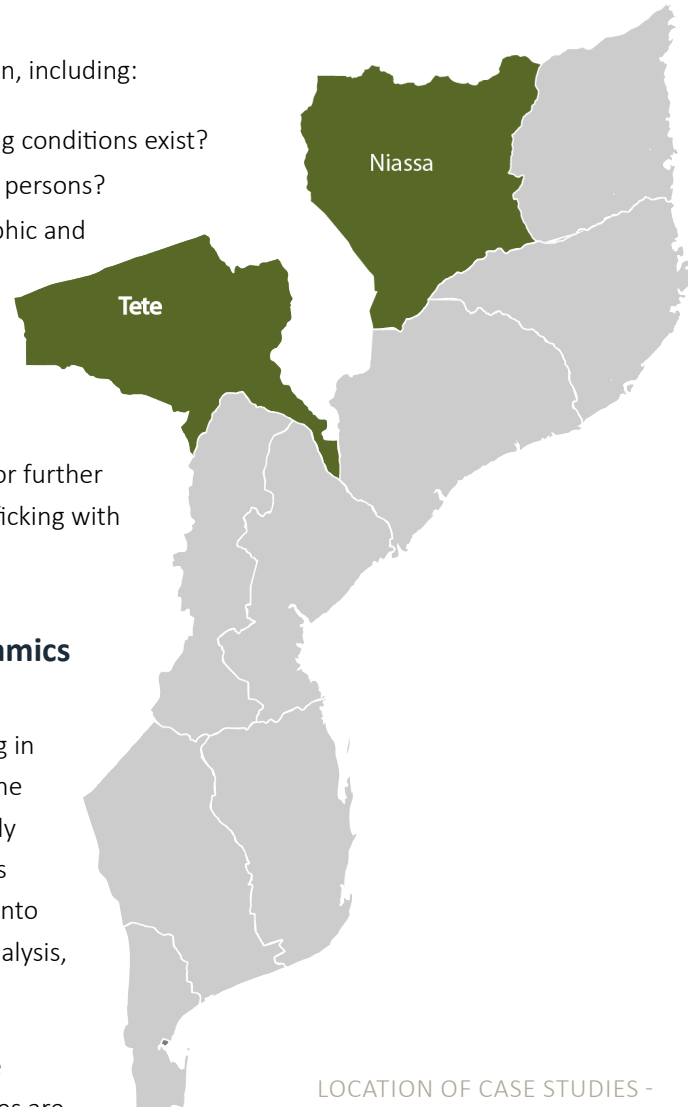
- For workers within targeted supply chains, what working conditions exist?
- Do these workers experience indicators of trafficking in persons?
- What root causes and contextual factors at the geographic and sectoral levels contribute to both trafficking in persons vulnerability and deforestation?
- How does previous or ongoing deforestation increase human vulnerability to trafficking in persons or other abuses?

A sub-goal of this research was to provide a starting point for further methodological inquiries and discussion linking human trafficking with forest and environmental degradation.

Mapping of Overlapping and Intersecting Dynamics

Key thematic elements that link deforestation/associated environmental degradation with a vulnerability to trafficking in persons were mapped as part of study preparation and in the development of a Mozambique study framework. Case study field research then sought to understand how these themes manifest in a particular context, with themes incorporated into research design including survey tool development, data analysis, and supplementary desk research.

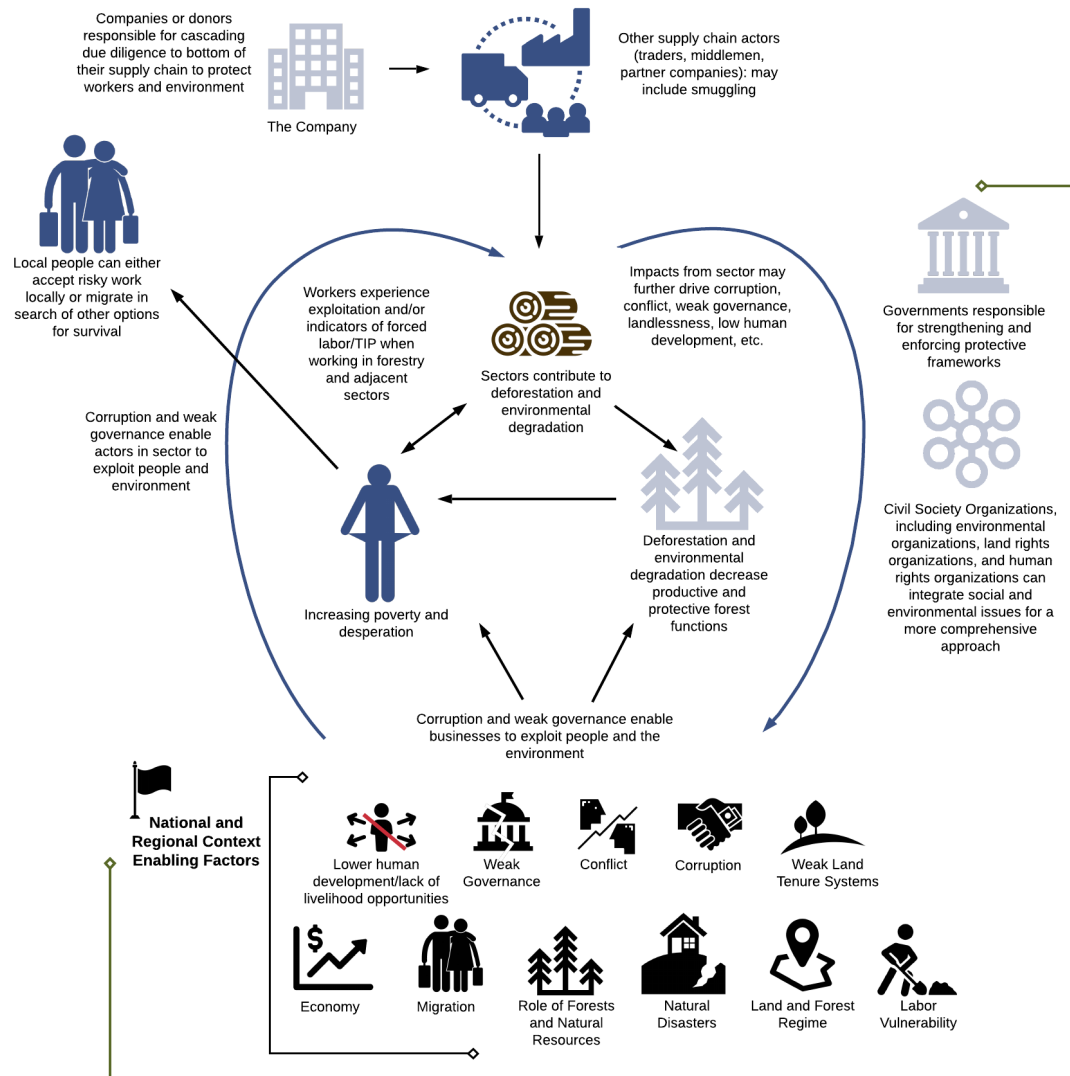
The visual below provides a graphic representation of these multilayered dynamics and their intersections. These linkages are overlapping and interrelated rather than discrete. Given that both environmental degradation of forested areas and labor abuse of workers in sectors that contribute to deforestation are ongoing concerns, there is no time-ordered dimension to the matrix below; that is, there is no single “entry” place for the framework. Instead, the map seeks to describe the various



LOCATION OF CASE STUDIES -
TETE AND NIASSA REGIONS, MOZAMBIQUE

linkages between environmental degradation and vulnerability to trafficking in persons that are occurring in forest-adjacent sectors at any given time.

FIGURE 1. MAPPING OF DYNAMICS ASSOCIATED WITH DEFORESTATION, ENVIRONMENTAL DEGRADATION, AND VULNERABILITY TO TRAFFICKING IN PERSONS



The first level of risk mapped above is tied to contextual factors at both the national and regional levels that contribute worker vulnerability as well as deforestation/environmental degradation; these are factors tied to the geographic locations where workers live and where work is taking place. These geographic contextual factors can be divided into two primary types. The first type is related to pre-existing social vulnerabilities. Poverty and low human development outcomes, combined with a lack

of viable livelihood options, are notable issues in rural and forested areas. The presence of these factors creates a bind for workers: either accept the conditions risky work in whatever sectors are locally available or migrate elsewhere to seek employment. Either option can leave individuals and families vulnerable to exploitation and, in some cases, trafficking in persons.

The second type of national and regional contextual factors are those related to the overarching issue of weak governance. These factors enable operators in the research target sectors (illicit logging, banana plantations, road and infrastructure development) to conduct business without sufficient regard for impact on human and environmental outcomes. National factors include legal and regulatory frameworks covering labor, forest management, land management, and environmental protection. National and regional geographic factors tend to be highly interrelated. Factors contributing to the vulnerability of workers and community members at both the national level as well as at the regional level were identified for examination in both case studies. National and regional contributing factors tend to be intersectional; that is, they are associated with other contributing factors and some factors may impact both governance and social vulnerability.

The next area of the map is working conditions— including any specific indicators of forced labor identified – experienced by individuals in target sectors that contribute to deforestation and environmental degradation. Poor working conditions and indicators of forced labor, such as low wages, in these sectors also exacerbate the pre-existing social vulnerabilities that exist among local populations. There may also be characteristics specific to the sector or supply chain that enable both labor abuses as well as deforestation.

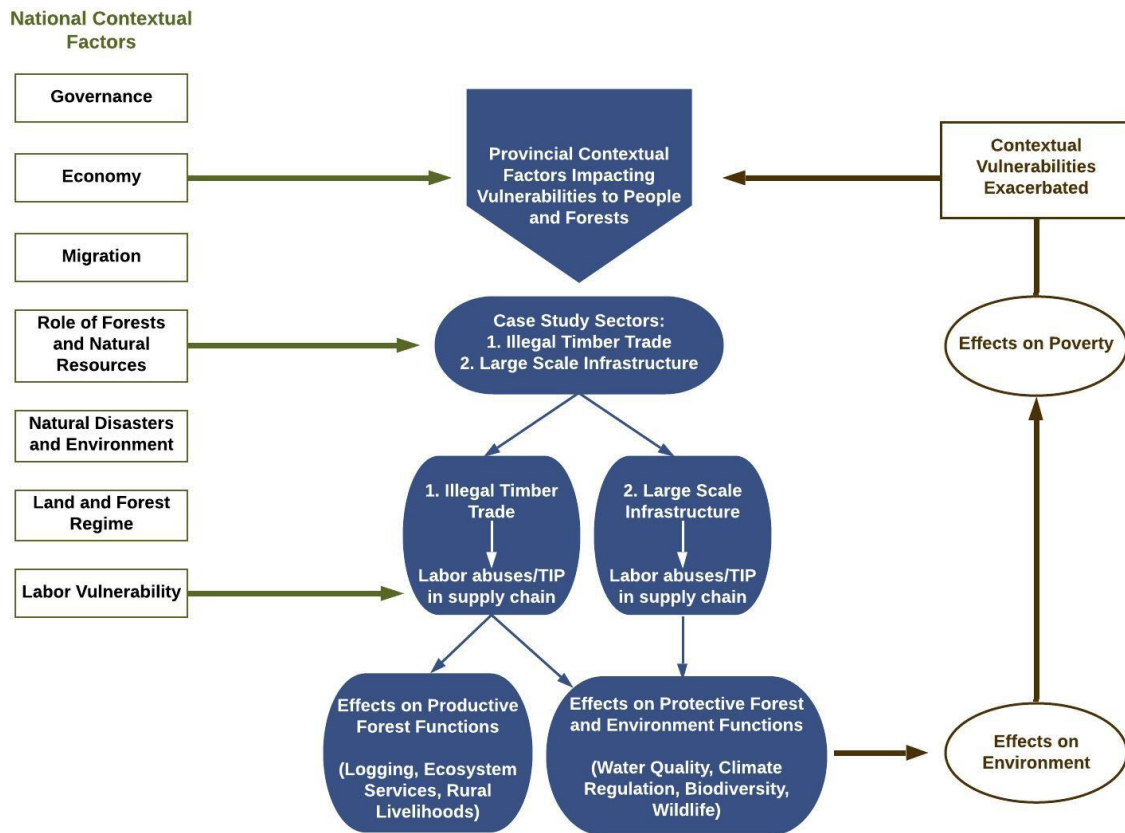
The pressure people experience to enter into vulnerable work is compounded by past and ongoing deforestation and environmental degradation. Deforestation, loss of access to forested lands, or degradation of forested areas – which can be caused by a wide variety of factors, including illicit logging, agricultural expansion, firewood harvesting, some forms of mining activities, forest fires and livestock grazing – can create a cascade of interrelated impacts on humans as the protective and productive functions of the forest are disrupted.

A range of stakeholders can be involved in ameliorating negative impacts on the planet and people, and this mapping also sought to identify the types of actors and institutions positioned to either enable or interrupt these dynamics. These stakeholders include companies, other supply chain actors, international donors, governments, and civil society groups.

Conceptual Framework for the Mozambique Study

The above mapping exercise was distilled into a conceptual framework to guide the Mozambique case studies, by demonstrating the more linear challenges between key enabling factors and processes, and the paths along which investigations would be organized and recommendations generated.

FIGURE 2. CONTEXTUAL FRAMEWORK FOR STUDY



The issues are complex, dynamic, and multi-layered with additional spatial and temporal dimensions. The left side of the conceptual framework encompasses the national and international contextual factors that contribute to the enabling environment that drives worker vulnerability as well as deforestation and other forms of environmental degradation; these include governance, the economy, migration, the role of forests and natural resources, the land and forest regime, labor vulnerability, and risks related to natural disasters and environment. For example, in the Mozambique case studies, forest and natural resources have attracted a range of investors in both Tete and Niassa with interest in both mining and forest activities. At the center of the framework, international, regional, and local actors, both public and private, seek to capitalize on these forest and natural resources and ensure that infrastructure in the form of roads, bridges, and rail can facilitate their exploitation and trade. Migrant laborers, both internal and external, are drawn to prospects for work where formal sector jobs are scarce. Forest and environmental degradation in the context of these economic activities should be mitigated through the land and forest regimes. However, although robust by law, they are weak in enforcement. This is at least partially due to decades of political conflict resulting in weak governance and capacity that impacts not only land and forest rights for communities, but also laws related to labor and environmental protection. Corruption has further weakened these legal frameworks.

At the center of the conceptual framework, these national factors tend to be highly interrelated, ultimately finding a spatial “home” at the geographic locations where workers live and where work is taking place at the provincial level and with local communities. Here, both illicit (timber trading) and legal (infrastructure provision) activities co-mingle with weak governance and corruption. In the Tete and Niassa Provinces, business is conducted without sufficient regard for impact on human and environmental outcomes, enabling abuse on multiple fronts. A wide range of actors, including police and community/local leaders, are vulnerable to bribes to support their own livelihood. When police accept bribes from logging operators, they may be more likely to criminalize workers, creating an environment of intimidation rather than serving as an avenue for recourse for abused workers. Bribes to community leaders can enable bypassing of community land, resettlement, and forest laws to make land available for commercial use or infrastructure development, increasing displacement of local communities—and compromising livelihoods.

In Mozambique, rural communities face pervasive poverty and low human development outcomes, weak protection of land rights, and a labor pool with an overall lack of viable livelihood options. The presence of these factors creates a population with severely limited economic options: either accept the risky conditions of work in whatever sectors are locally available or migrate elsewhere to seek employment. Either option can leave individuals and families vulnerable to exploitation and in some cases, trafficking in persons. Following this conceptual framework, this report describes labor conditions—including any specific indicators of forced labor identified—experienced by individuals in target sectors that contribute to deforestation and environmental degradation, which are presented in the Labor Findings sections of each case study. In addition to the conditions experienced by workers in the target sectors, when relevant, the case studies also provide information from secondary sources on trafficking vulnerability for the individuals who are pushed to migrate out of case study regions.

Moving to the right side of the conceptual framework, the research indicates a temporal dimension to the study. The pressure people experience to enter into vulnerable work is compounded by past and ongoing deforestation and environmental degradation. As the environmental integrity of forested areas is further and further compromised (often as a direct result of sectors with exploited workers), local communities lose both the protective and productive functions of forests that have supported their survival. Soil and water become polluted and unable to support subsistence agriculture. Soil becomes eroded and extreme weather events—in the case of Mozambique, vulnerability to cyclones—become more severe. Food insecurity increases. Without these supports for basic survival, the pressure on workers to enter vulnerable work increases even further. This report provides details on the role of forested areas at the national level as well as more specific regional information in each case study. Where applicable, researchers also sought information from community members to better understand the impact that deforestation and environmental degradation have had on their wellbeing and livelihood options.

To map out which recommendations could be made to a range of stakeholders for mitigating negative impacts on the planet and people, this analytic framework also seeks to present the types of actors and institutions that are positioned to either enable or interrupt these dynamics. To that end, each case study concludes with recommendations for stakeholder groups on potential approaches for disrupting the downward spiral of environmental degradation and human vulnerability.

Trafficking in Persons and Forced Labor Definitions

Verité bases its definition of trafficking in persons on the 2000 United Nations' *Protocol to Prevent, Suppress and Punish Trafficking in Persons Especially Women and Children*, also known as the *Palermo Protocol*. This protocol contains the internationally recognized definition of trafficking in persons, which includes forced labor:

“The recruitment, transportation, transfer, harbouring or receipt of persons, by means of the threat or use of force or other forms of coercion, of abduction, of fraud, of deception, of the abuse of power or of a position of vulnerability or of the giving or receiving of payments or benefits to achieve the consent of a person having control over another person, for the purpose of exploitation. Exploitation shall include, at a minimum, the exploitation of the prostitution of others or other forms of sexual exploitation, forced labour or services, slavery or practices similar to slavery, servitude, or the removal of organs.”¹⁷

This definition includes 3 elements – **the acts, the means, and the purpose** – that together constitute trafficking in persons.

Verité also relies on International Labour Organization Convention 29, which defines forced labor as:

“all work or service which is exacted from any person under the menace of any penalty and for which the said person has not offered himself voluntarily.”¹⁸

All forms of forced labor are banned under Mozambican law. The sanction for trafficking convictions is imprisonment for 16-20 years.¹⁹

Application of ILO's Forced Labor Indicators

To evaluate the risk of forced labor and the underlying practices that contribute to that risk, Verité analyzed for the existence of the forced labor indicators as presented in the Guidelines Concerning Measurement of Forced Labour published in 2018 by the International Labour Organization and the International Conference of Labour Statisticians (ICLS).²⁰ The ICLS Guidelines, in conjunction with earlier guidance on indicators provided by the ILO,²¹ provides specific indicators which can contribute to conditions of involuntary work and threat or menace of penalty, the two primary components of forced labor.²² These indicators can also demonstrate the “means” element for trafficking in persons

as defined under the Palermo Protocol such as “threat or use of force or other forms of coercion, of abduction, of fraud, of deception, of the abuse of power or of a position of vulnerability or of the giving or receiving of payments or benefits to achieve the consent of a person having control over another person....”²³

The indicators provided by the ICLS guidance are as follows:²⁴

Indicators of involuntary work*	Indicators of threat and menace of any penalty**
<ul style="list-style-type: none"> → unfree recruitment at birth or through transaction such as slavery or bonded labor; → situations in which the worker must perform a job of different nature from that specified during recruitment without a person’s consent; → abusive requirements for overtime or on-call work that were not previously agreed with the employer; → work in hazardous conditions to which the worker has not consented, with or without compensation or protective equipment; → work with very low or no wages; → work in degrading living conditions imposed by the employer, recruiter, or other third-party; → work for other employers than agreed; → work for longer period of time than agreed; and → work with no or limited freedom to terminate work contract <p><i>*any work taking place without the free and informed consent of the worker</i></p>	<ul style="list-style-type: none"> → threats or violence against workers or workers’ families and relatives, or close associates; → restrictions on workers’ movement; → debt bondage or manipulation of debt; withholding of wages or other promised benefits; → withholding of valuable documents (such as identity documents or residence permits); and → abuse of workers’ vulnerability through the denial of rights or privileges, threats of dismissal or deportation.²⁵ <p><i>**coercion used to impose work on a worker against a person’s will</i></p>

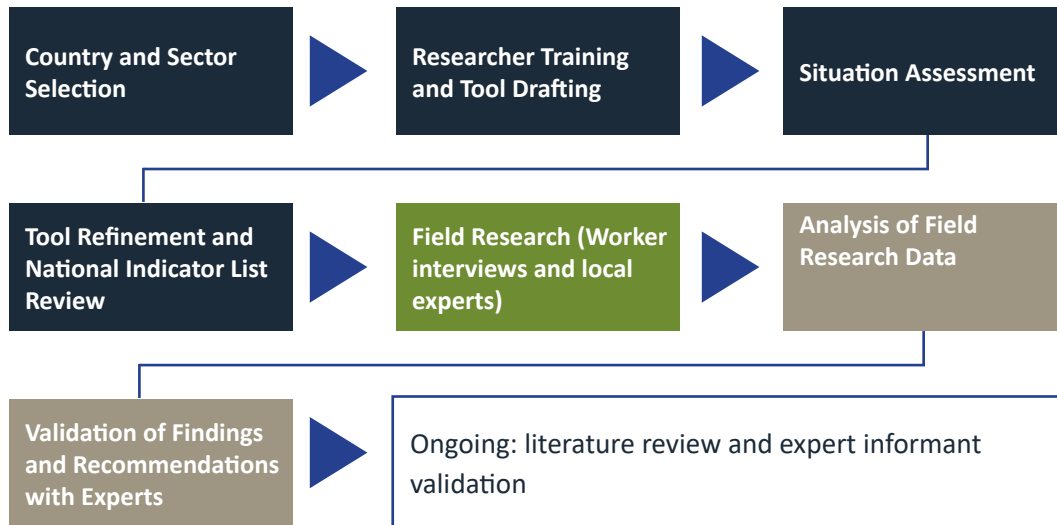
The indicator approach can be applied to identify an individual case of forced labor or to understand which indicators are present across a given population of workers. The research presented here focused on identifying which, if any, indicators of forced labor are present in the context of the two case studies presented here, how these indicators operate in practice, and what contextual issues enable the presence of vulnerability to and presence of risk factors for forced labor.

To ensure that the indicators and tools used in the research framework were relevant to the context of Mozambique, Verité undertook a process of generating a list of indicators relevant to the national and sectoral contexts, following the guidance provided by the International Labour Organization.²⁶ After starting with the full list of forced labor indicators as listed above, each was validated against a review of existing secondary source information (desk research). Then, Verité sought input from experts to determine which indicators should be included in the research framework.

Research Process

The research process took place in three primary phases: preparatory work, field research, and analysis and validation of findings.

FIGURE 3. RESEARCH PROCESS



Preparatory Work

Research began with a preliminary phase of expert consultations and a review of existing secondary source information (desk research), including national surveys, censuses, and reports on trafficking in persons from NGOs and international organizations. Relevant laws, government initiatives, and data from existing international programs to combat trafficking in persons were also reviewed.

After the initial desk review, researchers conducted a Situation Assessment in October 2018 to select communities and sectors in which to conduct the in-depth field research. The Situation Assessment was conducted primarily via interviews with expert informants familiar with the relevant contexts. The Situation Assessment illuminated the highly sensitive and insecure environments related to the Tete and Niassa case studies due to corruption and illegality. This required a careful approach and mitigation measures to ensure the security of both the research team and those who would be consulted in the field research phase.

Based on these results, Verité further refined field research tools, including a worker interview questionnaire, to assess the presence of forced labor indicators and general labor conditions for each case, including worst forms of child labor. These indicators included: situations in which the worker must perform a job of different nature from that specified during recruitment without a person's consent; work with no or limited freedom to terminate work contract; work with very low

or no wages; abusive requirements for overtime or on-call work that were not previously agreed with the employer; work in hazardous conditions to which the worker has not consented, with or without compensation or protective equipment; abuse of workers' vulnerability through the denial of rights or privileges, threats of dismissal or deportation; threats or violence against workers or workers' families and relatives or close associates; and withholding of wages or other promised benefits.

Field Research

Field research was conducted in February 2019 using semi-structured qualitative interview tools to elicit narrative information from workers and other expert informants in both individual interviews and focus group discussions.

Interview tools were constructed to provide insight into individual experiences as well as perceptions on the nature of conditions for others working in the sector. In each case study, researchers attempted to select a range of informants representing the diverse backgrounds and experiences of workers present. The information is presented in narrative form, using direct quotes from respondents when available to ground this framework in individual experiences. While the findings are qualitative in nature, when possible, the analysis provides quantitative details on the number of interviewed workers reporting a given phenomenon to illustrate broader trends and themes in findings. Security concerns precluded long sojourns in target research areas; instead, researchers sought to conduct rapid interviews in areas that would provide sufficient privacy and anonymity for interviewees. The context provided by local and international expert informants throughout the process was critical to validating themes emerging from individual worker interviews.

Sampling

Researchers used purposive and snowball sampling to identify respondents for the field research. Security concerns precluded research teams from extended activity in any single research site.

This sampling technique precludes statistically representative findings. Instead, researchers sought to illustrate broader trends and themes by speaking to a diverse group of individuals with experiences in the target sectors. Respondents were informed of the purpose of the interview, its voluntary nature, and the ways that the information shared might be used. Again, participation from the full range of potential stakeholders was challenging due to security concerns. For example, during the Situation

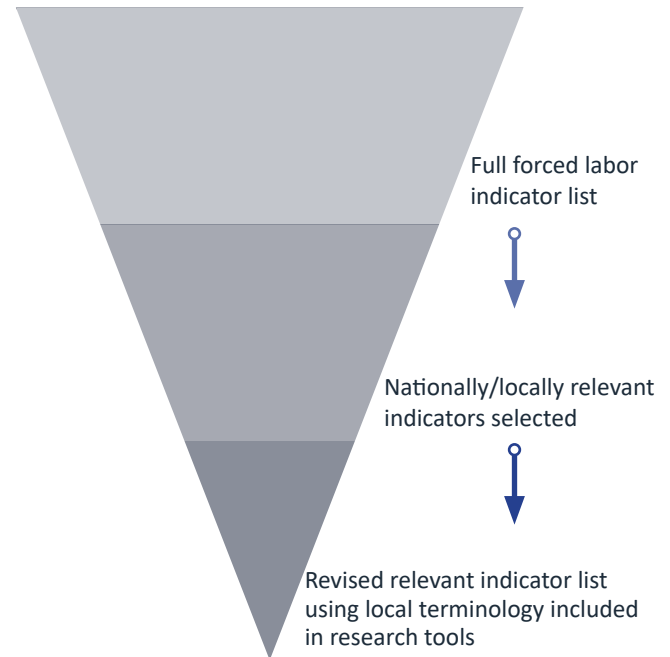


FIGURE 4. PROCESS TO IDENTIFY RELEVANT FORCED LABOR INDICATORS

Assessment, stakeholders including concessionaires, simple license holders, government technicians, and local politicians were approached to provide relevant information. Many stakeholders sought to disengage by stating that they were unable to recall information,²⁷ while others denied access to data or other relevant field information. Simple license producers who participated in illicit activities expressed extreme reticence around speaking. Several managers of timber operating companies were approached as part of the study but were unwilling to discuss information regarding working conditions.

Despite these constraints, researchers interviewed 89 people for case studies in Tete and Niassa. Approximately one third of interviewees were current or former workers, and two-thirds were local level forest license holders, grassroots community-based or non-governmental organizations, or community members.

All interviewees self-identified as adults and gave their ages as at least 18 years. The Tete case study found the presence of children as young as 12 working in timber yards. However, children were not actively sought out as interview subjects. Instead, researchers sought information on the conditions of children from other stakeholders. Conducting research with potentially vulnerable children requires additional ethical considerations that were not feasible given the brief time frame of worker interviews.²⁸

Security and Interview Protocols

During the Field Research phase, researchers also had to contend with potential security threats from actors threatened by research activities. The seasonality of work, remoteness of study locations, long work hours, and transportation during the rainy season were also factors in accessing workers and worksites. Researchers and workers were vulnerable to possible surveillance, retribution, or even detention. In order to avoid attracting the attention of authorities, researchers generally avoided spending more than a few days at a time in any single research locale. Instead, the researchers cycled through different villages and districts in Tete and Niassa quickly.

Worker interviews were conducted in places with sufficient privacy where workers could speak freely, away from oversight of employers or others. The research team was careful to maintain confidentiality and work with trusted and respected local NGOs and experts, gain the confidence of community members and workers, and ensure security of researchers and respondents. Interview notes were downloaded daily and firewalled to prevent their potential confiscation and to protect researchers and interviewees. All communications either through text or email were deleted. These constraints rendered intelligence and information provided by local and international expert informants critical to validating themes emerging from individual worker interviews throughout the process.

Further details on the specifics of sampling and interview processes are provided in each case study.

Pilot of Satellite Data to Evaluate Deforestation Associated with Target Sectors

The extent of deforestation across Mozambique, as well as in case study regions, has been previously documented. However, no explicit linkages between rates of deforestation and the specific areas, species, and sectors examined in the two case studies had been investigated. Therefore, no publicly available data was sufficient in its level of detail to show the precise spatial locations of *Pterocarpus Tinctorius* degradation. This is because it was not included in the 2018 Forest Inventory for Mozambique. Further, the road upgrading project in Niassa, the focus of Verité research, was ongoing at the time of field research activity.

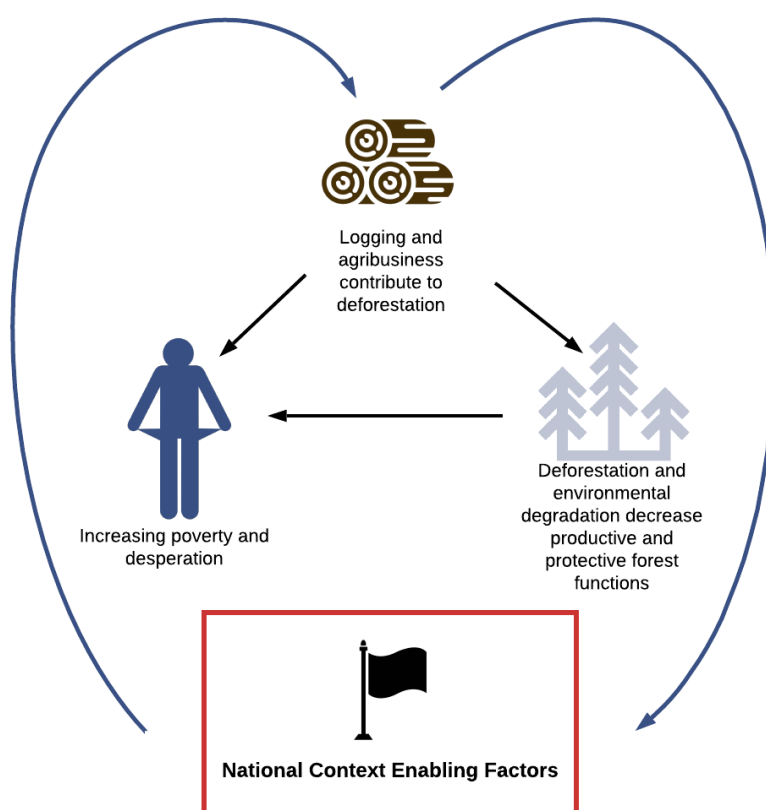
Given the recent experimentation with using geospatial satellite data to support work in the field of human rights, researchers sought to pilot emerging methodologies for documenting the deforestation and related environmental degradation tied to human activities in relatively small areas. Working with a team from the University of Nottingham's Rights Lab, a general contextual analysis of land cover was conducted at the sites of logging and road construction being researched, to detect recent land cover change and tree cover loss prediction mapping. Potential for use of satellite data to indicate human vulnerability was also explored.

Coordinate data to guide the mapping exercise was provided for both cases. Reduction specifically in *Pterocarpus Tinctorius* could not be confirmed. However, the satellite data analysis outputs showed clear loss of forest cover in the scrutinized areas of Tete where labor abuses were reported. Further, geospatial analysis also showed rapid development in the evaluated areas of Niassa along the EN13 road construction corridor, including mining activity and informal settlements, suggesting a potential change in the livelihood resources and patterns of local populations. Both Verité and the Rights Lab assert that additional ground intelligence should further validate and elaborate on these initial findings, which are presented in both case studies. See Annex 3 for the full report from the Rights Lab.

Mozambique Country Background and National Contextual Factors

This section explores relevant contextual factors at the national level that influence labor vulnerability and environmental degradation in forestry and adjacent sectors, as well as a review of migration as depicted in the Conceptual Framework.

FIGURE 5. THE ROLE OF NATIONAL CONTEXT ENABLING FACTORS ON DEFORESTATION, ENVIRONMENTAL DEGRADATION, AND VULNERABILITY TO TRAFFICKING IN PERSONS



Governance and Politics

Mozambique gained independence from Portugal in 1975 and experienced a prolonged civil war from 1977-1992. The country is still recovering from this conflict and continues to experience internal political strife and instability, particularly between the two main parties to the civil war, the ruling Mozambique Liberation Front (FRELIMO) and the opposing Mozambican National Resistance

(RENAMO). FRELIMO won re-election most recently in 2019,²⁹ with RENAMO maintaining a “low-intensity armed conflict”³⁰ again since 2013, with most active attacks between 2013 and 2016. A new peace agreement was rejected by RENAMO in August 2019. One of RENAMO’s primary demands is political decentralization.³¹

Corruption

Transparency International rated Mozambique at 26/100 for perceived level of public corruption in 2019,³² where a score of 0 means highly corrupt and a score of 100 means very clean.³³ The U.S. Department of Commerce stated in 2017 that “corruption is a concern across the government and senior officials often have conflicts of interest between their public roles and their private business interests. The problem of corruption and bribery also remain a major problem for Mozambican police forces.”³⁴

Several key agencies measuring public sector corruption have made similar determinations, concluding that some degree of corruption in Mozambique is evident at all levels of governance,³⁵ including the forestry sector.³⁶

The U.S. Department of Commerce reports that, despite progress by the Government of Mozambique in addressing corruption, particularly via strengthened legal frameworks, implementation progress has been slow.³⁷

Corruption has become a major concern in Mozambique. According to Transparency International, Mozambique’s Corruption Rank of 158 out of 180 countries reached an historical high in 2018.³⁸ The country also fares poorly on all six dimensions of governance measured by the World Bank’s Worldwide Governance Indicators (WGI) and has been progressively deteriorating.³⁹ According to Mozambique’s Centro de Integridade Pública, the most recent estimate of the cost of corruption to Mozambique in the period from 2002 to 2014 is an estimated US \$4.9 billion. The high level of corruption in Mozambique has created fertile ground for Illegal Financial Flows (IFFs) linked to illegal trading of goods in the natural resources sector, including timber, wildlife, and extractives.⁴⁰

Mozambique ranked 27th most fragile out of 178 countries in the 2020 Fragile States Index, which represents a composite measure of the social, economic, and political pressures facing countries and the resulting assessment of likelihood of conflict. Mozambique’s score has worsened over the past decade, indicating escalating vulnerability to instability and conflict; its sub-scores point to high levels of economic inequality as a major contributing factor.⁴¹

Since 2017, northern Mozambique has experienced violent attacks in Cabo Delgado province linked with extremist religious groups. One hundred thousand people have reportedly been displaced by violence that includes beheadings, arson, and disappearances.⁴² Further, Human Rights Watch reports that the responses of state security forces caused additional human rights violations as they attacked villages.⁴³

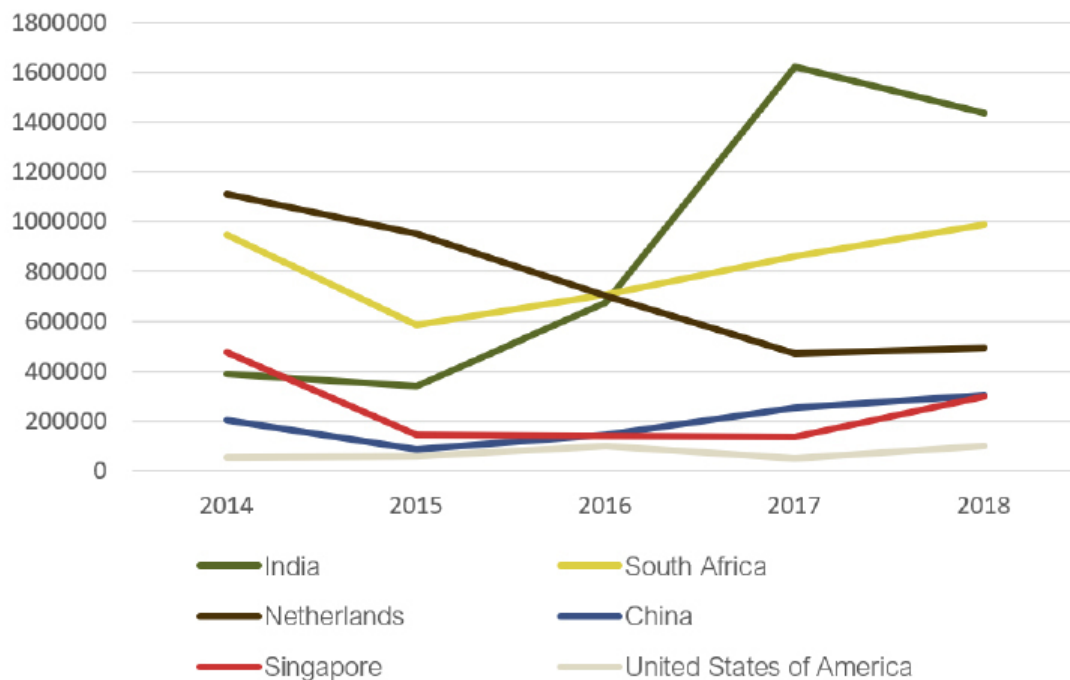
Economy

The 16-year civil war in Mozambique has deeply impacted the nation's economy, resulting in a 70 percent inflation rate by the end of the conflict.⁴⁴ Mozambique was the lowest ranked country in the world in GDP per capita (PPP) from 1992 to 1998.⁴⁵ The country has seen a steady increase in per capita GDP (PPP) for the last twenty years,⁴⁶ and the economy has a high growth rate. However, even with rapid growth, the country maintains one of top ten lowest GDPs per capita (PPP) globally.⁴⁷

According to data collected from Instituto Nacional de Estatística and UNCOMTRADE and analyzed by the International Trade Centre, the top exports in 2018 by value were mineral fuels, aluminum, ores (titanium), tobacco, precious and semi-precious stones, sugars, fish, and edible fruit and nuts. Wood and wood products were the 14th most valuable export,⁴⁸ although this figure does not accurately reflect the significant amount of wood smuggled from the country (discussed further in the Tete case study).

Countries importing the most goods, by value, from Mozambique included India, South Africa, the Netherlands, China, and Singapore. The United States was the 10th most significant importer of goods by value in 2018.⁴⁹

FIGURE 6. TOP COUNTRIES IMPORTING GOODS FROM MOZAMBIQUE 2014-2018 BY VALUE (USD TEN THOUSANDS)



Map derived with data from the International Trade Centre.⁵⁰

Mozambique's economy is thought to be significantly impacted by illicit financial flows (IFFs) linked to corruption and weak governance. One study estimated that Mozambique lost an estimated amount equivalent to 10 percent of the government's total revenue between 2005 and 2014 due to IFFs.⁵¹ Between 1980 and 2018, IFFs in Mozambique were estimated at more than 13.3 billion USD, or 8.7 percent of total trade during the period.⁵²

The majority of Mozambique's labor force (81 percent) is employed in the agricultural sector.⁵³ Smallholder farmers in rural areas represent 99 percent of the farming done in Mozambique, producing crops for subsistence like corn, rice, and cassava.⁵⁴

Mozambique's abundance of natural resources—including timber, minerals, coal, and natural gas—have brought international investment and represent a growth factor in the economy, attracting rural poor as internal migrants as well as economic migrants from neighboring countries.⁵⁵ Natural gas is present in the northern portion of the country, where major multinational companies have operations.⁵⁶ Economic opportunities, such as formal employment, arising from this bounty of natural resources and associated infrastructure development have had “limited linkages to the local economy” and thus far have provided limited benefits to the bottom 40 percent of the population.⁵⁷

The transportation sector has been noted as an economic growth area, even despite recent economic slowdowns, with the U.S. Department of State noting “major investments in ports and road infrastructure.” The country's primary ports are Maputo, Beira, and Nacala. Foreign direct investment (FDI) has largely been in infrastructure development and extractives, although FDI dropped significantly overall between 2015-2019.⁵⁸

China plays a significant role in the Mozambican economy. It was the Mozambique's fourth largest export partner from 2014-2018,⁵⁹ the largest creditor (in 2018),⁶⁰ and one of Mozambique's top foreign direct investors.⁶¹ China has also written off tens of millions of dollars of Mozambican debt, including USD 36 million in 2017.⁶² ⁶³ Chinese investment in Mozambique covers a wide range of sectors, including energy, extraction/mining, agriculture, and infrastructure development. China is reportedly the largest investor in Mozambique's infrastructure sector.⁶⁴ China's role in Mozambique's timber supply chain is significant. Around 90 percent of Mozambique's timber exports were destined for Chinese markets in 2018,⁶⁵ and a notable percentage of forest concessions (21% in 2017) in Mozambique have some level of Chinese investment.⁶⁶ The scale of the rapidly growing importance of China to the Mozambican economy led the International Institute for Environment and Development (IIED) to observe in 2018 that “massive [Chinese] investment in other sectors may be creating a disincentive to address forest issues.”⁶⁷

Poverty and Human Development

Wealth and income are distributed unequally in Mozambique, with rural areas in the northern and central regions of the country facing particularly high poverty rates. Approximately 72 percent of the population in rural areas experiences poverty, compared to 18 percent in urban areas.⁶⁸ This

is notable because the majority of Mozambicans reside in rural areas—an estimated 66 percent of the country’s 29 million people.⁶⁹ A lack of employment opportunities outside of agriculture has contributed to poverty in rural areas in Mozambique, including the case study regions of Tete and Niassa. The majority of households living in poverty are engaged in agriculture and/or forestry in some capacity.⁷⁰ Agricultural production rates have historically been low in Mozambique, making livelihoods for these populations tenuous.⁷¹ That said, because so much of the impoverished population lives in areas with land suitable for forestry and agriculture, these sectors have been identified by the government as key drivers of future growth.⁷²

Other root causes of poverty include lack of education, low agricultural productivity, vulnerability to natural disasters, and gender inequality.⁷³ Less than half of all Mozambicans finish primary school, only 8 percent move on to secondary school, and the country’s overall literacy rate is 47 percent.⁷⁴

Women in Mozambique experience each of these vulnerability-exacerbating factors at higher rates than men, including a 72 percent rate of illiteracy (compared with 40 percent rate among men).⁷⁵ Ninety percent of economically active women who earn money do so in the agricultural sector.⁷⁶ Ninety-five percent of women in rural areas work mainly in subsistence agriculture (compared with 66 percent of rural men).⁷⁷ Women make up the majority of the unskilled workforce, but their work is often unpaid.⁷⁸ In addition, women are subjected to early marriage, gender-based violence, high maternal health risk,⁷⁹ and low contraceptive availability and use, resulting in an average of five children per woman (with higher rates of children per woman in rural areas).⁸⁰

Migration

Although many areas of Mozambique have high rates of poverty and limited formal employment opportunities, the expansion of projects to extract natural resources has simultaneously expanded Mozambique’s profile to regional migrants seeking opportunity.⁸¹ Historically, Mozambique’s ports, as well as its overland access to South Africa, have encouraged bordering landlocked countries to fortify trade routes.⁸² Smugglers have also benefited from these networks, with reports finding smugglers of ivory and timber engaging in cross-border smuggling to take advantage of Mozambique’s port access.⁸³ Growth of the economy and the extractive industry in particular has attracted an increase in cross-border migration, in a place where mobility and migration were already a way of life. According to a UN report, 17,935 migrant workers entered Mozambique legally in 2017.⁸⁴ Assessments have shown workers have been subjected to sexual and labor exploitation, including forced labor in the agricultural sector, and that human traffickers have benefited from the complicity of Mozambican police.⁸⁵ The U.S. Department of State has noted forced labor vulnerability for migrants from Mozambique in agriculture and mining in South Africa; in Eswatini; and in forced labor and sex trafficking in Angola, Italy, and Portugal.⁸⁶

In addition to transnational migrants, there are high rates of domestic migration as individuals move between provinces to seek opportunity.⁸⁷ Vulnerability of migrants to forced labor indicators and labor rights abuses identified will be discussed in relevant case studies.

Role of Forests and Natural Resources in Mozambique

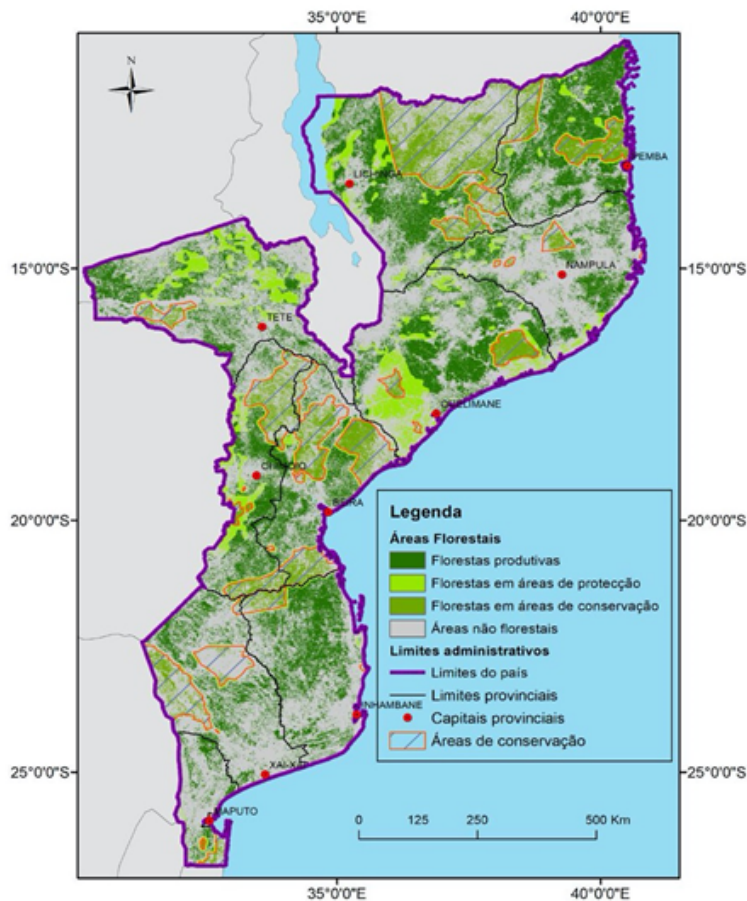
There are over 32 million hectares of forests across Mozambique. 27 million hectares are categorized as productive forests as shown below.⁸⁸ A significant percentage of the impoverished population in Mozambique lives in areas with land suitable for forestry, raising the profile of forestry activities as a potential growth sector. Representing over 60 percent of natural forest coverage, the most significant forest ecosystem in Mozambique is miombo woodlands,⁸⁹ which are also present in the area covered in the Tete case study below.

Miombo woodlands play a number of crucial protective and productive roles for Mozambicans. In terms of protective functions, they act as reservoirs of above- and below-ground carbon and have significant potential as a carbon sink. Carbon stock in Mozambique is estimated at over 5.2 billion CO₂.30, which is considered by experts to be a globally-significant climate mitigation potential.⁹⁰ This significant carbon store is central to the country's climate change mitigation commitments, including REDD+.⁹¹ These forests also provide wildlife habitat, local climate and water regulation, watershed protection, and reduction of soil erosion.⁹²

Productive and healthy forest ecosystems in Mozambique are critical in terms of supplying options and alternatives for well-being and economic development. The miombo forests provide essential goods such as food, energy, nutritional and medicinal materials, shelter, home building materials, and medicines for local communities. They have income generation potential and serve as a safety net by providing secure access to resources and services critical to food security. Many Mozambicans, while not participating in the formal export economy, receive small ongoing sources of income from local sales of non-timber forest products (NTFPs) such as food products, essential oils, cosmetics, construction and handicrafts, and hygiene products. Forests also provide critical cooking/heating materials in the form of charcoal and firewood. Forest biomass provides the majority of household energy consumption in Mozambique. Charcoal can also provide livelihoods for rural populations with up to 214,000 people in Mozambique earning livelihood from employment in charcoal sales.⁹³ The presence of healthy forests can help Mozambicans remain resilient even when facing loss of income/employment and weakening of traditional natural resource bases as a result of natural disasters such as floods.⁹⁴

Forestry operations contributed about 13 percent of Mozambique's GDP in 2016. Over 20,000 people are reportedly formally employed in forestry enterprises in Mozambique.⁹⁵ Wood and wood products were the 10th highest contributor to national export earnings in 2019.⁹⁶ The volume of logs for export has increased between 2007 and 2017 (see **Annex 1**). Five species comprise 90 percent of commercial demand: Umbila (*Pterocarpus angolensis*), Mondzo (*Combretum imberbe*), Chanfuta (*Afzelia quanzensis*), Pau-ferro (*Swartzia madagascariensis*), and Jambire (*Millettia* *tuhlmannii*).

FIGURE 7. MOZAMBIQUE PRODUCTIVE, PROTECTIVE, AND CONSERVATION FORESTS MAP⁹⁷



Source: National Directorate of Forest (DINAF)

creation from these plantations is considered overestimated, however, professional forestry skills and training typically required for forest plantation work imparted workers with desired skills in the job market, leading to a significant increase in employment options for them.¹⁰⁴ The rise of plantation-based forestry in Mozambique could also hypothetically assist in meeting domestic needs for wood products and biomass energy in particular.¹⁰⁵

Land and Forest Regime

Experts have judged Mozambique to have a strong de jure legal framework around land usage, with laws that aim to protect the rights of local communities while still encouraging commercial investment to bolster the overall economy. The 1997 Land Law is the primary legal instrument regulating land usage, with subsequent legislation controlling more specific situations.¹⁰⁶ In practice however, full implementation of these legal policies is judged to be low, reflecting “tensions... between a government keen on promoting foreign investment and agro-industry and a rural population that is insufficiently aware of and not always able to exercise their legal rights.”¹⁰⁷ The

These species are not the dominant species in Mozambique’s miombo forests.⁹⁸ However, illegal logging in Mozambique has been well documented by global advocacy organizations such as the International Institute for Environment and Development (IIED),⁹⁹ the Center for International Forestry Research (CIFOR),¹⁰⁰ and the Environmental Investigation Agency (EIA). A 2014 EIA study found 93 percent of logging in Mozambique during 2013 was illegal.¹⁰¹

Plantation-based forestry has also been noted as a strong potential source for economic growth opportunities in the future.¹⁰² The government has proposed a goal of 1 million hectares of commercial forest plantations by 2030, from the approximate total of 60,000 hectares.¹⁰³ The promise of job

legal framework has supported land grabbing by elites (as the law gives land right preferences to those seeking to bring unused resources into production),¹⁰⁸ and poor rural Mozambicans have helped facilitate deforestation, as they have incentives to work with operators engaging in environmentally degrading, profitable practices.¹⁰⁹

All land in Mozambique is ultimately held by the state. Individuals or groups can obtain either individual or community long-term occupancy and usage rights through customary and ‘good faith occupation’ via a *Direito do Uso e Aproveitamento de Terra* (DUAT) under the 1997 Land Law. DUATs granted for subsistence and household purposes are perpetual.¹¹⁰ Some land, known as public land, is held in perpetuity by the state, and no DUATs can be issued.¹¹¹ For a community’s customary claim to be recognized and registered as a DUAT, complex and expensive procedures must be completed and filed correctly by the community. This hurdle has resulted in the majority of rural communities not being registered. As a result, the majority of DUATs are held by corporations and the wealthy, who were financially and logistically able to complete the process.¹¹² Unregistered land is still widely recognized as belonging to a particular community if they have met occupancy requirements. However, these claims are essentially invisible on official maps, and due to increasing demand from interested investors, these unregistered communities are increasingly vulnerable to losing their tenure rights.¹¹³

The 1997 Land Law requires investors seeking to secure land rights to determine via direct community consultation whether land is truly unoccupied, and if not, then they must negotiate access with the DUAT holder. This prescribed consultation process was intended to facilitate community-level input into development decisions. However, civil society organizations have noted that, in reality, these processes tend to be cursory with little meaningful community participation.¹¹⁴

Forestry Management

Government oversight of forests in Mozambique is largely the responsibility of two ministries: The National Forest Directorate at the Ministry of Land, Environment, and Rural Development (MITADER) manages and implements policies relevant to use and conservation of natural forests. The Ministry of Agriculture and Food Security oversees forest plantations.¹¹⁵

The primary legal instruments governing forestry management are the Forestry and Wildlife Law (1999) and the Forest and Wildlife Regulation (2002). These frameworks categorize forests in Mozambique into three primary categories: protected conservation forests; productive forests, which are not under conservation management and can be used for forestry activities; and multiple-use forests.¹¹⁶ A replacement for the Forest and Wildlife Law was in draft form in 2017.¹¹⁷

Although the State retains all rights to forested land under the Forest and Wildlife Law, individuals or groups can hold rights to reside on the land. The right to benefit commercially can be obtained via a license; personal and community consumption of forest resources for subsistence needs does not

require a license. The right to reside on the forested land does not automatically confer the right to benefit commercially from the forest; the two types of rights can be granted separately.¹¹⁸

The two forms of commercial licenses for harvesting timber from non-plantation forests in Mozambique are concessions and simple licenses. Simple licenses are intended for exclusive use by Mozambicans to commercially benefit or derive fuel wood from non-protected forests.¹¹⁹ The exact terms of harvesting under a simple license vary based on tree species, time, location, etc., and conditions must be aligned with any relevant forestry management plans for the proposed area. However, no area mapping is required for successful application for a simple license.¹²⁰

Concession licenses are not limited to Mozambican nationals and require a more arduous application process compared with simple licenses.¹²¹ Applicants must submit a more detailed plan in order to be in compliance with applicable forestry management regimes¹²² and must also apply for a separate license to harvest timber. However, once granted, concession licenses can confer rights for a much longer period of time – up to 50 years – whereas simple licenses are only granted for a maximum of five years at a time.¹²³ The harvesting license provides limits on species and volume for harvesting.¹²⁴ Volume limitations for timber harvesting or export of specific species can be set by decree.¹²⁵

The responsibilities inherent in issuing and managing licenses and management plans is delineated to multiple entities. At the national level, the National Directorate of Forests (DINAF) of the MITADER is responsible for the issuing of licenses, protection, supervision, conservation, and management of forests and the monitoring of consumption by communities. At the provincial level, the Provincial Forests and Wildlife Services Office, under the purview of the Provincial Directorate of Lands, Environment and Rural Development is responsible for cutting licenses and ensuring successful implementation of all related laws. Lastly, local resource management councils (*Conselhos Locais de Gestão de Recursos Florestais e Faunísticos* or *Comités de Gestão Participativa*) composed of representatives of the local community, private sector, forestry-related associations and government officials are responsible for ensuring that the communities they serve benefit from the exploitation of their forests.¹²⁶

COMMERCIAL TIMBER HARVESTING TYPES

Type of License	Duration	Area	Requirements	Type/Amount of Product Eligible
Simple ¹²⁷	1-5 years	No more than 10,000 hectares	Intended for use by Mozambican nationals only Requires simple forest management plan Consultation with local communities residing on land Does not require publishing name of operator and license area	500 cubic tons of timber/annually 1000 steres charcoal/annually ¹²⁸
Concession ¹²⁹	25-50 years, renewable	More than 10,000 hectares	Depending on size, management plan approved by provincial governor or National Forests Directorate (over 20,000 hectares) Requires separate license to harvest and transport which must be renewed annually License holder must demonstrate proof of processing capacity such as sawmill Consultation with local communities residing on land Requires publishing name of license holder and concession area	Volume of timber limited to amount listed in forest management plan; Specific harvest volume per species specified in annual harvest license No commercial charcoal production allowed under concession license

Mozambican laws provide de jure protection for communities living in forested areas with active commercial activities. Under the Forest and Wildlife Law, both simple licenses and concession contracts require consultation with local communities for application approval. The Law also provides for the creation of local councils to oversee licensed operations in the community.¹³⁰ Further, if a company with a concession license is hiring employees for commercial operations, they are legally obligated to prioritize employment of local people (as per the 2002 Forest and Wildlife Regulation).¹³¹ Twenty percent of applicable taxes on forestry activities and 50 percent of fines for forestry violations are intended to provide income to local communities. However, communities reportedly rarely receive the full compensation to which they are entitled from taxes and fines.¹³²

Implementation of Forestry Management Frameworks

Compliance with Mozambique's forestry management legal frameworks is low. Less than 40 percent of concessions nationally were found to meet minimum standards of compliance in a recent government study.¹³³ Non-compliance can reportedly take multiple forms, including lack of an adequate (or any) Forest Management Plan, operating outside the concession area, and a lack of saw mills.¹³⁴ The root causes of this gap in implementation of the legal framework is attributed to weak governance and a lack of government institutional capacity.¹³⁵ It has also been noted that the existence of the two-tiered licensing system, one of which is less rigorous, motivate commercial timber actors to avoid these requirements via the establishment of relationships with local individuals to more easily and illegally facilitate the extraction of unprocessed timber for export.¹³⁶

For example, the Tete case study discusses how Chinese companies established joint-ventures with Mozambican partners to secure access to simple licenses.

The simple license regime is the most prevalent but least transparent process to track. According to experts interviewed for this study, data is not readily available from forest authorities in Mozambique and simple license holders may hold more than one license or may hold a concession in addition to simple licenses. Other operators may simply be acting without any license. Documented infringements to the simple license regime include logging of protected species or species other than that for which the license was granted, logging with falsified license documents, cutting logs with a diameter below the recommended level, harvesting or transporting timber more than 10 per cent in excess of the licensed volumes or transit permits, cutting more than the annual allowable cut, transporting products without a transit permit or a forest certificate, and passing permits from one operator to another.¹³⁷

Illicit Logging, Deforestation, and Supply Chain Opacity in Mozambique

Deforestation is occurring at an alarming rate in Mozambique. An estimated 9 percent of Mozambique's forest cover has been lost just since 2000.¹³⁸ According to data supplied by the University of Nottingham, a general overview of forest cover and past forest gain/loss was obtained for Mozambique at a country level and for the two case studies, Tete and Niassa from Global Forest Watch. Data derived from another study showed Mozambique as a whole has experienced increasing tree loss from 2000-2018.¹³⁹

MOZAMBIQUE TREE COVER LOSS 2001 - 2018

Level		Total land area	Tree gain 2001-2012 (kha)	Tree loss 2001-2018 (Mha)	Decrease in tree cover 2001-2018 (%)
Country	Mozambique	79.0	145	3.05	11
Province	Tete	10.1	1.3	123	6.9
	Niassa	13.0	0.91	303	5.3

Source: University of Nottingham Rights Lab ¹⁴⁰

FIGURE 8. TREE COVER LOSS IN TETE AND NIASSA IN HECTARES 2001-2018



Source: University of Nottingham Rights Lab¹⁴¹

Despite the reforms mentioned above, Verité field research, as well as reporting from media and civil society, has found that illicit logging – and export of illicitly harvested logs – continues. The scale of illicit logging is difficult to measure, although several previous studies have attempted to do so by noting discrepancies between reported Mozambican export volumes and corresponding countries’ import volumes.¹⁴² The studies all used slightly different data and made comparisons over different time periods. Although the methods used varied, the common finding was that Mozambican exports of timber were lower than either total world imports of Mozambican timber or Chinese imports specifically. These studies also present consistent discrepancies observed over a long term, suggesting a potential pattern of undocumented trade.¹⁴³ In 2018, MITADER set a target of just 350,000 cubic meters of timber to be felled that year, with exports capped at 436,000 cubic meters of timber and wood products (to allow for the export of wood products processed in the previous year). However, 600,000 cubic meters were felled in the first quarter of 2018 alone.¹⁴⁴

Smuggling of illicitly logged timber over land between Mozambique and Tanzania has been previously documented.¹⁴⁵ Researchers heard anecdotal reporting that logs may also be smuggled out through Zambia and Malawi. There is also anecdotal reporting that elephant tusks may be smuggled out of the country alongside illicitly harvested timber.¹⁴⁶

Around 90 percent of Mozambique’s timber exports go to China.¹⁴⁷ One study’s sampling found that about 29 percent of forest operations are funded at least partially by Chinese capital, but the figure may be conservative as not all operations include or require investor nationality to be listed.¹⁴⁸ In the past, Chinese companies provided “forward financing” to Mozambican concession companies to

source timber.¹⁴⁹ However, according to interviews with local informants, they are now establishing their own concessions and trading companies under the simple license regime, often through joint ventures with Mozambicans.

Labor Vulnerability

Mozambique has a labor force marked by relatively low levels of education, specialized skills, and high unemployment. A large majority of the Mozambican population is engaged in the informal or shadow economy. Accordingly, the current rate of unionization is very low (estimated to be 2.5% of the labor force),¹⁵⁰ and less than 15 percent of the population is engaged in the formal sector.¹⁵¹ Those living in remote, rural areas are especially impacted both by lack of jobs and by changes in the environment brought about by climate change, natural resource extraction, forest loss degradation, and concomitant environmental degradation.

According to the U.S. Department of State 2019 Trafficking in Persons Report: Mozambique, forced child labor occurs in agriculture, mining and vending in rural areas. Women and girls experience sex trafficking and forced labor in domestic work, particularly along major transnational transportation routes and in areas with “highly mobile populations and large number of truck drivers.” The Department of State also reports that growing extractive industries could increase demand for sex trafficking, including child sex trafficking.¹⁵² In addition to the instances of forced child labor noted above, the U.S. Department of Labor 2018 Child Labor Report: Mozambique notes the risk of child labor across a number of sectors including agriculture, fishing, forestry, livestock, mining, construction, domestic work, vending, commercial sexual exploitation, and assisting in illicit activities such as drug trafficking and wildlife poaching.¹⁵³

The U.S. Department of State has reported that labor inspectorate in Mozambique is under-resourced, with an insufficient number of labor inspectors. Sanctions for labor violations are reportedly infrequent. Corruption may also affect the functioning of the labor inspectorate in some cases.¹⁵⁴

Natural Disasters and Environment

The population of Mozambique is vulnerable to a range of natural disasters and extreme weather events including droughts, floods, and cyclones/tropical storms.¹⁵⁵ Sixty percent of the population lives in regions that will be increasingly affected by storms as sea levels continue to rise.¹⁵⁶ Cyclones have wrought particular damage in recent years, with Cyclone Kenneth and Cyclone Idai affecting over two million residents and displacing an estimated 60,000.¹⁵⁷ The rise and severity of cyclones is thought to be linked to deforestation,¹⁵⁸ with the loss of shade leading to air pressure fluctuations and resulting increased wind speeds. Healthy dense forests can also slow the rate at which water reaches the ground, decreasing flooding.¹⁵⁹ Other large-scale environmental challenges include water pollution from oil operations in the Gulf.¹⁶⁰



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Case Study: Illicit Harvesting of *Pterocarpus Tinctorius* in Tete Province

In Tete province, illicit timber exploitation is thriving in a context of corruption, weak governance, and poverty in a post-conflict state, enabling a range of activities that underpin both labor rights abuses and deforestation.

As will be described below, these activities include abuse of permits and concession licenses, bribery, operating without management plans, under-reporting export volume, smuggling raw logs, and harvesting and transporting undesignated species. Demand for *Pterocarpus Tinctorius*, hereafter referred to as *Nkula*, from international markets has disincentivized stronger governance.

While environmental organizations have documented the rapid spread of illicit logging and export, much less is known about the conditions for workers engaged in logging. Verité's research sought to shed light on labor conditions and vulnerability in the sector, push and pull factors for work, vulnerability linked to environmental degradation and other contextual factors, and potential intervention points to better protect both forests and people.

Methodology

Verité conducted rapid appraisal-style field research to assess labor conditions in the illicit logging sector in select locations in Tete Province, as well as environmental degradation and associated impacts on surrounding communities. Field research consisted of semi-structured qualitative interviews with workers, community members, and other local and international experts. Respondents were selected using purposive snowball sampling. A review of relevant literature was also conducted to ground and validate findings.

Field data collection for this case study was conducted primarily between March - April 2019. Interviews were conducted in areas of Macanga and Marávia. Researchers utilized a semi-structured interview tool to conduct qualitative research. Individuals were selected for interviews using snowball sampling. Interviews were conducted one on one and in focus group discussions. Security considerations warranted rapid entries and departures to interview sites.

A total of 44 interviews were conducted in Tete Province, including 15 forest workers, two simple license holders, two forest technicians, 10 concession holders, and 15 experts from academic or civil society backgrounds.

During the Field Research phase, researchers had to contend with challenging access issues as well as the potential security threats from actors threatened by research activities. The seasonality of work, remoteness of study locations, long work hours for workers, and access issues related to the rainy season were also factors in accessing workers and worksites. Researchers and workers were vulnerable to possible surveillance, retribution, or even detention. In order to avoid attracting the attention of authorities, researchers generally avoided spending more than a few days at a time in any single research locale. Instead, the researchers cycled through different villages and districts quickly. Worker interviews were conducted in places with sufficient privacy where workers could speak freely, away from oversight of employers or others.

Due to the small number of worker interviews and the lack of a scientific sampling strategy, this sample cannot be taken to be representative at a national or sector level. This rapid appraisal research was not intended to determine the prevalence of labor violations, but rather to uncover risks that should be further explored by more in-depth research.

Tete Province Contextual Background

Tete Province borders Zambia, Malawi, and Zimbabwe. The province is rich in forest and natural resources, but the population is highly vulnerable, with high rates of poverty¹⁶¹ and low educational and living standards outcomes. Ongoing political conflict between the ruling FRELIMO and minority RENAMO parties in Mozambique has resulted in attacks and displacement of people living in some communities in Tete.¹⁶² The conflict has also lessened capacity for natural resource management, including oversight of forest activities.¹⁶³

Economy, Climate, and Human Development

Highly reliant on subsistence agriculture, Tete is one of the most food-insecure areas in Mozambique, particularly in the months before the agricultural harvest season.¹⁶⁴ The Famine Early Warning Network has indicated levels of acute food insecurity and that people are in urgent need of food assistance.¹⁶⁵ Food inflation occurring in 2016 and 2017 translated into a poverty increase of between 4 and 6 percent because of reliance on maize for consumption.¹⁶⁶ This was further compounded by inadequate rainfall in 2018 and the subsequent poor harvest. In January of 2019, heavy flooding from Tropical Cyclone Desmond displaced an estimated 120,000 people across Manica, Sofala, Tete, and Zambezia provinces and damaged homes, infrastructure, and crops.¹⁶⁷ These effects were compounded by Cyclone Idai, which affected more than 168,000 hectares of crops in Tete and neighboring Zambezia.¹⁶⁸ Without interventions, the majority of rural farmers engaged in small-scale agriculture on less than 2 hectares of land in Tete will continue to feel significant pressures brought about by weather-related hazards, ecosystem services, and climate change associated with forest loss. Entrenchment into poverty is especially risky for the 69 percent of agricultural jobs held by women.¹⁶⁹

AERIAL VIEW TETE PROVINCE IN MOZAMBIQUE



Although the region has traditionally experienced high rates of poverty, it is currently in the midst of a natural resource boom, with an associated uptick in mining projects. Basic metals such as copper, nickel, and zinc associated with gold, vanadium, and silver have been discovered in Chividè and Fíngoè. An estimated 23 billion tons of mostly untapped coal reserves have been found in the districts of Moatize, Changara, Mutarara, Marávia, and Zumbo. Iron, vanadium, and titanium, as well as graphite and phosphate, can also be found in Tete.¹⁷⁰

Major multinational mining companies have invested nearly 12 billion USD in mines in Tete since 2008, directly employing some 7,500 workers—many of whom are not local to the area—and sparking a sudden transformation of the region.¹⁷¹ As of 2013, mining concessions and exploration licenses approved by the government covered around 3.4 million hectares, which is 34 percent of Tete province's area. When licenses pending approval are taken into account, experts estimated in 2015 that around 60 percent of the province's area would be covered, representing a project area of around six million hectares of land.¹⁷²

While examining the impact of these mining activities was outside the scope of this research, it is worth noting that environmental consequences associated with these extractive sectors—including air pollution, deforestation, soil contamination, soil erosion, waste overflow, surface water pollution, decreasing water quality, groundwater pollution or depletion, and large-scale disturbance of hydro and geological systems—may further compound the food insecurity and vulnerability of local people.¹⁷³

Mining activities in the area have drawn migrants from other provinces in Mozambique, as well as from Zimbabwe, Zambia, Malawi, Somalia, and Ethiopia.^{174 175} The influx of migrants has reportedly caused some tension with local residents, who are concerned about potential competition for employment opportunities and other benefits from the resources boom.¹⁷⁶

A range of civil society organizations in Mozambique oppose these natural resource extractive activities and investments due to concerns regarding environmental degradation, population displacement, degraded roads, and potential conflict.

Role of Forests and *Pterocarpus Tinctorius*

Tete has the third largest forested area (3,827,883 ha) in Mozambique, ranks fourth in productive forest area (2,175,199 ha), and is fifth in total volume of commercial species.¹⁷⁷

The forested area in Tete is composed of miombo woodlands, the most extensive forest ecosystem in Mozambique. Forests in the Tete region have historically provided important defense against the impact of cyclones on local people.¹⁷⁸

Pterocarpus Tinctorius — referred to as *Nkula*, or sometimes as *Mkula* or *Mukula* — is a species of wood native to Tete Province. The species plays several important roles in the ecosystem. The

trees are a pollen source for bees and a source of food for critical wildlife, including elephants and baboons.¹⁷⁹ It is a nitrogen fixing species and is highly impacted by unregulated logging because it is extremely slow growing.¹⁸⁰ In Tete, the species has historically been used for firewood and charcoal by local communities. However, consumer demand on the international market for rosewood – a genus of trees with brownish or reddish hues that *Nkula* closely resembles – has driven concomitant commercial harvesting of *Nkula*. Rosewood and lookalike species are highly trafficked. According to a UNODC database of global wildlife seizures from 2004-2015, rosewood accounted for 35% of all wildlife seizures, the highest proportion of any wildlife product.¹⁸¹ China is the primary market for rosewood and lookalike species. The high and growing rates of demand have led to the endangerment of the species in China and subsequent exploitation of rosewood in West Africa, Central America, and Southern Africa.¹⁸² As rosewood trees have become less available due to overharvesting, replacement or “look-alike” species, including *Nkula*, have increasingly been targeted for Chinese markets. Harvesting of rosewood alternative species has boomed in miombo forests in many countries in the Congo river basin including Angola, Burundi, the Democratic Republic of the Congo, Malawi, Mozambique, the United Republic of Tanzania, and Zambia. Once the species is exhausted in one country, trading networks leapfrog to neighboring countries. As demand spikes and market prices for these species rise correspondingly, unsustainable harvest practices – often associated with corruption and community violence – have led to deforestation and habitat destruction.¹⁸³

In the late 1990s, an expanding global pursuit of rosewood moved into Mozambique, following a predictable outcome experienced in other forests. A “boom and bust” cycle sees steep rises in harvest and export volumes from individual countries before a sudden collapse, or “bust.” High market prices enable unsustainable harvesting and habitat destruction, accompanied by corruption and violence by and against enforcement officers and community members.

Illicit *Nkula* harvesting in Tete follows this pattern. The boom in Mozambique was preceded by unsustainable harvesting of related species in neighboring Zambia and Malawi. Malawi banned exports of all roundwood in 2008,¹⁸⁴ but illicit *Nkula* harvesting and trade with China has continued.¹⁸⁵ Zambia banned exports of a similar look-alike species in 2014, although illicit harvesting reportedly continued, largely unabated, leading to a subsequent ban in 2017. Zambia is estimated to have lost over a million hectares of these *Pterocarpus* species between 2000 and 2014. Because the species was not previously in high demand, it had not benefitted from international regulations around extraction rates or trade.¹⁸⁶ In the case of Mozambique, the logging, collection, and export of *Nkula* was banned in 2018.¹⁸⁷ *Nkula* had not been included in Mozambique tree species census efforts, so a record of overall volume and distribution is not available and hence has created difficulty in estimating the extent of species loss.

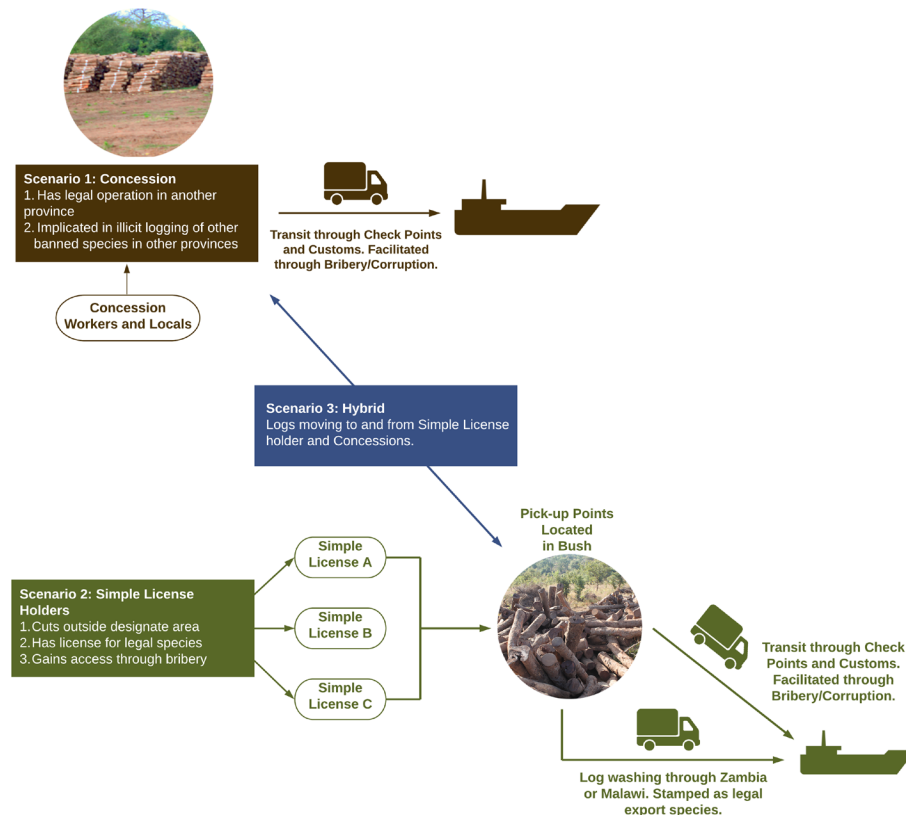
Findings on Labor and Other Vulnerabilities for Workers in Illicit Harvesting of *Pterocarpus Tinctorius*

Business Actors and Structures

Workers and community members interviewed by Verité researchers in Macanga and Marávia described multiple types of and relationships between business actors in Tete engaged in *Nkula* extraction, each with apparently different associated labor vulnerabilities for the workforce doing the harvesting. Three of the models seemed to be accompanied by different labor practices, structures, and associated labor vulnerability imposed by the employer.

Each of these scenarios is described below. Labor conditions and vulnerabilities are then analyzed according to each set of actors.

FIGURE 9. PTEROCARPUS TINCTORIUS SUPPLY CHAINS IN TETE PROVINCE



Verité found some evidence that in some additional cases, local workers form work crews independently of traders or middlemen working on their behalf and sell logs directly to any interested buyers. Because these workers operate with relative independence and do not have any supervisor, manager, or employer setting terms of work, they were not a focus of this exploratory research.

Scenario 1: Company with Concession Elsewhere in Mozambique

Some workers interviewed by Verité were employed directly by a company that held a legal concession license to operate elsewhere in Mozambique (in Manica Province). These workers had been transferred to Tete to participate in what appeared to be illicit harvesting of *Nkula*. The company did not hold a valid commercial concession license for Tete. This company was known to export to markets in Europe, Asia, South Africa, and the United States of America.

The exact mechanism by which this company had gained access to forest land to harvest was unclear to Verité researchers. Community members described in general terms scenarios in which companies holding concessions elsewhere in Mozambique reportedly negotiate for access to land with local chiefs, sometimes in exchange for material support for the community such as school construction, or in other cases, via direct bribes to community leaders. In this particular case, community members interviewed referred to this company by name and reported that they believed it to have “an agreement with the chief,” as they had heard from their chief that he had negotiated with this company.

This company was headquartered in Europe, though its concession operators in Mozambique were locally known to be Chinese nationals. Community members reported that other companies with similar arrangements to access land in Tete were headquartered in China.

Scenario 2: Trader with Simple License

Verité also interviewed several workers who were working for Chinese or Mozambican middlemen who had connections to Chinese or Mozambican traders with simple licenses. Simple licenses were obtained by Mozambican citizens, for the small-scale extraction of legal species of timber. These licenses were then either used by Mozambicans as cover for illegal harvesting of *Nkula* or sold to Chinese traders who similarly used them as cover for illicit *Nkula* harvesting.

As stated above, corruption at multiple levels of governance and enforcement allowed for a wide range of improper use of simple licenses: allowed cutting volumes were exceeded, cutting occurred outside designated areas, species not designated for harvest were cut, etc. Simple licenses are intended for use only by Mozambican nationals. However, community members interviewed by Verité researchers described scenarios in which foreign (primarily Chinese) traders were also able to secure a license via a partnership with a Mozambican national. This has also been reported in local media.¹⁸⁸ Foreign traders reportedly typically accessed local communities via middlemen who serve as liaisons between the two sides. In some cases, local Mozambican traders who held licenses directly assembled and supervised work crews themselves or worked through local middlemen.

Middlemen were typically local to the harvest area in Tete. They provided two services to traders. The first was to negotiate entrance into forest communities. Typically, negotiations were held with village leaders. In some cases, village leaders acted as good-faith negotiators on behalf of their

communities, making requests such as support for local schools. In other cases, they received gifts or bribes that may have benefited themselves more directly. Police who accepted bribes also may have intervened on behalf of the trader to pressure communities to participate in fraudulent simple license logging. This allowed traders to access harvesting in areas where the majority of local community members may have had objections.

The second role played by middlemen was the creation and supervision of work crews to enter the bush and harvest logs. This will be described in more detail below.

“To gain access to an area the community leaders did not ask for money, but did ask for roof sheets for a school, since there is not a school nearby. Our community even made bricks but 2 years later no roof sheets were forthcoming. It is difficult to contact the trader that we dealt with, as he avoids the community.”

– Log Peeler, Marávia District (Male, Age 22)

As mentioned earlier in this report, the names of simple license holders are not made public, nor are the locations, which makes supply chain transparency difficult. It is not likely that workers would have full visibility into the licensing arrangement the trader had established. Findings reported here are from workers who believed themselves to be supplying to traders who had procured a simple license under which to operate.

Scenario 3: Hybrid: Trader with Simple License and Links to Company with a Legal Concession Elsewhere in Mozambique

Finally, other workers interviewed by Verité described working for a contractor. This contractor was subordinate to a trader who himself was also directly employed by a major concession holder elsewhere in Mozambique. In addition to his paid employment for that commercial company, the trader reportedly acted as a “free agent” to procure illegally harvested logs from Tete Province via misuse of a simple license. (See Scenario 2 above for description of how simple licenses are misused for illicit *Nkula* harvesting.) Workers interviewed had worked for this contractor under this simple license arrangement since 2014.

Conditions experienced by workers with links to this model appeared to be worse than those experienced by other types of logging workers interviewed. These workers were more anxious and highly concerned about the risk of being reported to the police. They provided very brief responses during interviews. Interviews were generally made short due to the clear discomfort of the respondents.

Labor Conditions

Scenario 1: Company with Legal Concession Elsewhere in Mozambique

Worker Demographics, Types of Workers, and Employment Relationships (Scenario 1)

Workers interviewed by Verité estimated that approximately 80-100 workers associated with logging activity in Tete were directly employed by a company with a concession in Manica. These workers performed a mix of duties and were assigned as general laborers or timber workers (described in the table below).

Workers originated from Tete and other locations in Mozambique, as well as neighboring countries including Zambia, Malawi, and Zimbabwe. Interviewees estimated that approximately one third of these workers were originally from countries other than Mozambique.

Non-local Mozambicans generally had a previous employment relationship with the company in Manica before being sent to Tete. These workers were more likely than local and transnational migrants to have a formalized employment relationship, although they often lacked contracts. Workers with previous relationships to the company were more likely to be engaged as tree harvesters.

Local workers and transnational migrant workers were engaged on a seasonal, temporary basis. They worked both as timber workers and general laborers.

Timber workers were directly involved in harvesting wood (specific tasks include identifying trees, felling trees, dragging logs, loading logs onto trucks, and peeling logs). General laborers were engaged in support roles such as cooking, laundry, fetching water, and providing security. Field research also found they may assist with log peeling.

While it appeared that the vast majority of the workers were men, there was anecdotal evidence that women participated in dragging logs. There was no evidence that women migrated to logging areas with their spouses, and researchers therefore believe that women engaged in log dragging were local to the area.

SUMMARY OF TYPES OF WORKERS FOUND DURING FIELD RESEARCH

Type of Worker	Origin	Job Tasks	Employment Basis
General Laborers	Predominantly Mozambicans local to Tete, with a smaller number of non-local Mozambicans	Cooking, laundry, water fetching, security, odd jobs Security guards sometimes also assisted in log peeling	Local Mozambicans working as general laborers appear likely to be engaged on seasonal/as-needed basis Non-local Mozambicans are typically permanent workers who had previously worked for the company's legal concession elsewhere in country
Timber Workers	A mix of local, Tete-based workers, non-local Mozambicans, and transnational migrants	Tree tracking, cutting, log dragging, log peeling, log loading	Workers local to Tete were typically engaged on a seasonal basis Non-local Mozambicans typically had an existing formal employment arrangement with the company that held a concession elsewhere Transnational migrants were likely to have been engaged on a seasonal, informal basis

Entry into the Sector and Work Agreements (Scenario 1)

Local Workers

Local general laborers interviewed described seeking work in logging due to a lack of other livelihood options, citing their dependence on subsistence agriculture, dearth of employment opportunities, and the pressure of supporting families.¹⁸⁹ Interviewees nearly uniformly discussed stresses of poverty when discussing their motivations for entering logging. One general laborer, for example, said he took the job only as a last resort to prevent him from stealing in order to feed his family.

There is some evidence of deceptive recruitment for local workers. One worker reported that they had been deceived regarding the legality of the operation, noting that they had been told that *Nkula* is a legal species and they should not be afraid to work. Local workers also reported that although the wage they were initially offered struck them as low, they had been promised a raise in the future as well as food provisions, neither of which ever materialized. The long hours of work (sometimes up to 17 hours a day) were also not described during recruitment. Tasks were also not made fully clear. For example, both drivers and security guards were told to peel logs at peak periods. This task had not been described to them during recruitment.

No local workers reported receiving contracts or detailed terms of employment – for example regarding hours of work – nor were any local leaders present at the time of hiring to verify earnings or other terms promised to preclude future disputes. Local workers interviewed reported that, per communications from their chief, they were under the impression that a greater number of

permanent jobs would be available to the local community, but this was not the case. They believed that the chief made these promises regarding potential jobs because he had been bribed by representatives of the company.

Locals who sought jobs in logging typically did so by networking with laborers transferred from the legal concession elsewhere in the country, as well as with other local workers. Transferred workers were described by local workers interviewed as “permanent” employees with formal pre-existing relationships with the company and having networks or connections with managers there. The dynamic described by interviewees suggests that these transferred workers may be able to leverage their networks to control access to jobs, reportedly requiring bribes from jobseekers in exchange for work referrals. The reported amounts requested in bribes varied. Some cases were described as creating a debt burden, with local workers borrowing money from community members to pay the bribe. While this debt is not directly imposed by the employer as a means to compel further work or to bind the worker to the job, it can nonetheless create pressure on the employee to continue working long enough to repay any loans.

Workers Transferred from Concession Located Elsewhere in Mozambique

Workers that had been transferred from a concession located elsewhere in Mozambique reported having been given promises of accommodations, food, and wage increases associated with taking the job in Tete. Upon arrival, these workers discovered they would be responsible for their own accommodations and food, and no wage increases were forthcoming.

Interviewees noted that anyone who became sick or injured was responsible for their own medical care, including transport out of the timber yards. They were not actively deceived about this cost during recruitment, but they did not fully understand it before undertaking the work. Some workers described being fined by the company for grievances related to their job conditions in Tete. Although voluntary acceptance of these job offers was implied by the workers interviewed, they also described an understanding that their continued employment was contingent on agreeing to be transferred.

While local workers were likely to have the “safety net” of some form of subsistence agriculture for the survival of themselves and their families, transferred workers typically depended on their wages for the entirety of their livelihood, which made them more dependent on these earnings and less able to walk away from the job. While some local workers reported quitting the work after several months once they realized the low level of wages, transferred workers reported feeling that they had no option but to remain in the job even though they were unhappy with the conditions and felt they had been deceived about job terms.

Transnational Migrants

Verité was able to interview two transnational seasonal migrant workers about their recruitment conditions as timber workers. They did not have any prior relationship to the company now

employing them. They reported having been hired by a Mozambican supervisor and were not promised a specific wage at recruitment. Differences in earnings per the size of logs was not described to them during recruitment and had a significant effect on earning yield in practice, particularly as stocks of *Nkula* declined over time.

One of the interviewees was originally from Malawi but reported having lived already in a village in Mozambique prior to entering the logging sector. That worker described to the interviewer that police had visited the village where he had been staying and that people in the village were told to work. While researchers believe this may represent the use of local law enforcement to coerce labor in the logging sector, it does not necessarily represent a specific effort to target and coerce transnational migrants.

SUMMARY OF FORCED LABOR INDICATORS: ENTRY INTO THE SECTOR AND WORK AGREEMENTS

Forced Labor Indicator	Type of Worker Impacted
Situations in which the worker must perform a job of different nature from that specified during recruitment without a person’s consent	General laborers and timber workers who had been transferred from the concession located elsewhere in Mozambique
Work with no or limited freedom to terminate work contract	General laborers and timber workers who had been transferred from the concession located elsewhere in Mozambique

Wages and Earnings (Scenario 1)

Local timber workers interviewed indicated that their earnings were typically in accordance with what they had been promised upon hiring. Log cutters and loaders reportedly received 3,000 MZN per month (44.45 USD).¹⁹⁰ The legal monthly minimum wage for agriculture, livestock, and forestry in 2019 was significantly higher, at 4,390 MZN (66.51 USD).¹⁹¹ Workers engaged informally to drag logs reported being paid 50 MZN (0.76 USD) for each log dragged to loading. Transferred workers had the highest wages, at up to 8,000 MZN (121.20 USD) per month. However as noted above this amount was significantly defrayed by the cost of accommodation and food. These workers also noted wages being deducted for penalties and fines.

Transnational migrant workers interviewed appeared to receive the lowest earnings. While transnational migrants interviewed were paid 50 MZN (0.76 USD) as promised for cutting large logs, for small logs, they were paid only 20 MZN (0.30 USD). They reported that this distinction had not been made to them at hiring. One transnational migrant worker interviewed reported that he earned so little that he was in debt to his friend from whom he had borrowed money to afford food.

Workers were unlikely to have any recourse should they have a dispute around earnings. One worker interviewed recounted that he approached his Mozambican supervisor because he felt that he was being underpaid by 20 MZN (0.30 USD) per log. He was told he would be fired if he complained again.

SUMMARY OF FORCED LABOR INDICATORS: WAGES AND EARNINGS

Forced Labor Indicator	Type of Worker Impacted
Work with very low or no wages	Local and transnational workers

Hours (Scenario 1)

According to workers interviewed by Verité, hours for all types of workers were highly variable. Excessive overtime, sometimes through the night, was often required of timber workers and sometimes security guards or cooks and cleaners, particularly during peak periods. Similarly, workers were often called upon to engage in tasks not assigned to them at hiring. For example, if a truckload of logs arrived at night, security guards or cooks/cleaners were required to work overnight unloading or peeling logs. This condition was reportedly not communicated to workers at hiring.

Typical hours for timber workers was reported at 10-14 hours but up to 17 hours per day during peak periods. General laborers also were required to work very long days during peak periods but had regular hours during normal periods.

Interviewees reported that any worker refusing overtime could be threatened with termination.

SUMMARY OF FORCED LABOR INDICATORS: HOURS

Forced Labor Indicator	Type of Worker Impacted
Abusive requirements for overtime or on-call work that were not previously agreed with the employer	Timber workers and general laborers

Health and Safety (Scenario 1)

No health and safety issues were reported specifically for general laborers but, given that general laborers may also participate in occasional timber related tasks such as log peeling, they are potentially vulnerable to the risks described below.

For timber workers, the most significant health and safety risk discussed by interviewees pertains to an illness that is reportedly experienced by workers who participate in log peeling. Timber workers interviewed described chills, fever, fatigue, and cough, which can require rest or up to one week before returning to work. Interviews with forest specialists and tropical medical experts indicate that log peeling may result in protracted organic dust exposure that can cause “organic dust toxic

syndrome” (ODTS) or “Woodworker’s Lung,”¹⁹² a type of respiratory disease, although there is no definitive evidence linking these specific illnesses with *Pterocarpus Tinctorius*. Workers also reported an illness they associate with contact with *Nkula* sap, rather than the dust, although researchers could not find references to this illness in medical literature reviewed.

Transferred workers were reportedly provided with safety equipment including gloves, goggles, or boots, while local and transnational workers were not.

“Good things and good labor conditions can only happen there in Beira and Chimoio because watchers are close by. Here no one is watching and they can abuse us.”

– Local and Seasonal Timber Cutter, Chiuta District (Male, Age 25)

Security guards interviewed described having no shelter or place to rest during shifts during the day and night.

Timber workers reported difficulty in accessing adequate drinking water while working remotely and had to travel long distances for potable water.

One transferred worker stated that he might be given up to 300 MZN (4.54 USD) for medical care. However, local workers understood that if they were sick or injured on the job, they were responsible for transport to a hospital or clinic and for treatment costs.

SUMMARY OF FORCED LABOR INDICATORS: HEALTH AND SAFETY

Forced Labor Indicator	Type of Worker Impacted
Work in hazardous conditions to which the worker has not consented, with or without compensation or protective equipment	Timber workers, general laborers when required to peel logs

Abuse and Harassment (Scenario 1)

Timber workers interviewed reported that the threat of denunciation to police was used to discourage workers from selling logs to any other trader. (Diversion of logs was a prominent dynamic in *Nkula* trading. As the species was becoming depleted, workers in the supply chain as well as community leaders reportedly sometimes tried to sell logs to “the highest bidder”. This might be an independent Chinese trader or a Mozambican middleman.)

Some workers reported knowledge of workers who had been physically beaten by police for having lodged grievances concerning wages and working conditions. One worker interviewed reported physical abuse from a supervisor as a form of discipline for being late. Transnational workers reported fearing deportation at the hands of police.¹⁹³

SUMMARY OF FORCED LABOR INDICATORS: ABUSE AND HARASSMENT

Forced Labor Indicator	Type of Worker Impacted
Abuse of workers’ vulnerability through the denial of rights or privileges, threats of dismissal or deportation	Timber workers

Child Labor (Scenario 1)

Interviewed adult workers reported that they had observed children peeling logs in timber yards controlled by the company with a legal concession in Manica. This was confirmed by community experts. Children observed generally ranged in age from 14 to 18, with some interviewed reporting children they believed to be as young as 12. These children reportedly did not use any safety equipment. The scale of children engaged in logging activity is not known and warrants further investigation. Children participating in log peeling are likely to experience even more significant health risks than adults, including respiratory disease.

Verité researchers spoke with a local informant on the condition of anonymity who reported that, in Zumbo district, children were known to be working on a concession peeling logs under “slave like” conditions and living in primitive structures described as “grass huts.” These children were reportedly living without parents or caretakers present. The research could not confirm this due to the remoteness and inaccessibility of referenced concession sites.

Interviews with adult workers and experts from local advocacy organizations indicated that children likely earn as much money as their adult counterparts per log peeled.

Community-based organizations interviewed reported that most children engaged in logging work were driven to the work by the intense poverty experienced by their families as well as lack of nearby schools.

Scenario 2: Trader with Simple License

Worker Demographics, Types of Workers, and Employment Relationships (Scenario 2)

According to workers and other sector and community members interviewed, it appears that simple license operations in Tete Province typically range in size from 20 to 100 workers, with workers divided into crews of six to eight.

Verité field researchers interviewed 20 workers working under simple licenses. Workers interviewed were from Marávia and Macanga. Literacy levels ranged from high to low. Among workers interviewed, experience harvesting *Nkula* ranged from three months to two years. That two years was the longest length of experience points to the fact that *Nkula* harvesting is a relatively recent

phenomenon and did not occur at any scale in Mozambique until the ban in Zambia. All noted that their only alternative source of livelihood and subsistence is maize cultivation.

Of workers who were interviewed, some worked under a Chinese trader directly supervising work crews, and some worked under a Mozambican or Chinese middleman functioning as a work crew supervisor. Regardless of supervisor nationality, the basic structure of work crews was consistent: a small crew of tree trackers, cutters, and log loaders entered the bush and stayed for a period ranging from two weeks to several months.

“Everybody here is in the wood business... We had no way of getting money. We have no other job to secure food or for our survival. The Chinese need us to find (Nkula) trees, so we work.”

—Crew Chief, Marávia District (Male, Age 32)

A somewhat separate role was that of truck driver; the drivers were typically not engaged in other harvesting tasks. They assumed great risk in transporting illicitly harvested logs. They worked for the trader. No drivers were interviewed for this exploratory research.

Entry into Sector (Scenario 2)

Three workers interviewed who worked under a Chinese trader as their direct supervisor reported that at the time of recruitment, they had not been fully informed of the terms of payment. For example, although they were told they would be paid based on number of logs cut, they were not told that the size of the logs would be a factor in determining their earnings. However, upon receiving payment, they were told that logs under 20 cm in diameter would not be compensated, even though the smaller logs are ultimately accepted and sold by traders. Workers who experienced this deception estimated they lost 26,600 MZN (approximately 403 USD) per timber crew (typically comprised of 6-8 workers) due to not being paid for small logs.

SUMMARY OF FORCED LABOR INDICATORS: ENTRY INTO THE SECTOR

Forced Labor Indicator	Type of Worker Impacted
Situations in which the worker must perform a job of different nature from that specified during recruitment without a person’s consent	Timber workers

Wages and Earnings (Scenario 2)

Workers interviewed described two employment and wage payment systems, one in which they worked under a Chinese trader directly supervising work crews and were paid directly by that supervisor, and another in which they worked under a Mozambican or Chinese middleman

functioning as a work crew supervisor. In this second case, workers were paid via a Chinese or Mozambican supervisor who received a lump sum and was empowered to distribute it amongst the workers “as he saw fit.”

In some cases, inputs such as chainsaws and fuel were provided to middlemen without deductions imposed. In other cases, these costs would be deducted from the lump sum payment provided to the middleman. One middleman reportedly received chainsaws, fuel, and a fixed wage per truck load of logs. In other cases, fuel costs were deducted from the lump sum. There was no fixed schedule for payment disbursements by traders to middlemen.

One middleman reported he was indebted to a Chinese trader for a motorcycle that had been provided to him, and that he must continue working for this trader until the vehicle is paid off.

Most timber workers interviewed under the simple license arrangement were reluctant to share information about earnings. In some cases, payments to workers under Chinese traders acting as supervisors were made later than promised.¹⁹⁴ Log peelers reported a consistent rate of 50MZN per log peeled. Cost per truckload of logs reportedly varied widely, from 6,000MZN at the peak of species availability to 2,000MZN at the time of field research, when *Nkula* availability was severely depleted. Researchers were unable to determine how this would translate to estimates of a monthly wage level. Workers complained of low wages particularly more recently during the time of depleted stocks and in light of the strenuous and dangerous nature of the work. As noted above, workers also reported not being paid for smaller logs, which resulted in significant earnings losses.

Workers working for a middleman did not report wage deductions for inputs like use of chainsaws or gas. Supervisors typically paid for those costs out of cash provided by the trader.

Abuse and harassment associated with wage payments is discussed below.

Health and Safety (Scenario 2)

No workers interviewed, regardless of direct supervision, received safety equipment such as gloves, boots, protective eyewear or clothing, or helmets. Sickesses associated with handling of *Nkula* logs and sap from those logs, as was the case with log peeling, was noted by workers. Travel costs associated with any sickness or injury obtained in the course of work activities were the responsibility of timber workers. If workers left due to illness or injury, any wages already owed would not be paid.

While these conditions were hazardous, Verité determined that there was not sufficient evidence to qualify for the forced labor indicator “work in hazardous conditions to which the worker has not consented, with or without compensation or protective equipment” because it was not apparent from the interviews whether the conditions had been previously consented to by workers. However, it should be noted that the nature of informed consent was mediated by a profound lack of alternative livelihood options.

Living Conditions (Scenario 2)

Timber workers interviewed described severe isolation while in the bush, living in makeshift camps of tents deep in the forest for weeks and months. Workers described conditions as “very harsh and very difficult.” They were responsible for their own food, water, and shelter. Provisions were carried in or foraged. Hunting for bushmeat was described. Finding water was especially problematic.

Because these remote conditions were not imposed or obviously leveraged by employers in order to restrict freedom of movement, and living arrangements were not provided by the employer, the corresponding forced labor indicators (restrictions on workers’ movement and degrading living conditions, respectively) were not found to be present.

Abuse and Harassment (Scenario 2)

Workers reported verbal abuse, threats, and in some cases physical abuse from the trader when they expressed disagreement with the wage payment system. Workers described scenarios in which Chinese traders called the police and threatened timber workers with arrest and jail. Most workers interviewed stated that they would not seek out police intervention for abuses or wage theft either out of fear or because it was known the police protected the Chinese supervisors and not the workers.

Workers interviewed who worked under a Mozambican supervisor reported relative transparency in earnings. Those workers reported being paid by the load rather than by number of logs accepted by the trader. They earned 500 MZN (7.58 USD) per truck loaded and reported being paid consistently, without intimidation.

SUMMARY OF FORCED LABOR INDICATORS: ABUSE AND HARASSMENT

Forced Labor Indicator	Type of Worker Impacted
Threats or violence against workers or workers’ families and relatives or close associates	Timber workers

Scenario 3: Hybrid – Trader with Simple License and Links to Company with a Legal Concession Elsewhere in Mozambique

Recruitment and Work Agreements (Scenario 3)

Only timber workers were interviewed under this scenario.

Timber workers laboring under this scenario – as compared to other scenarios described above – appeared to researchers to be at highest risk of exploitation. They generally were hesitant to engage with researchers, and very little information was able to be gathered about their working conditions

and employment relationships. These workers seemed to be the most under threat from both their employer and the police, as described in Abuse and Harassment below. It is perhaps important to note that this model also exhibited the highest degree of informal and irregular movement of logs between concessions, independent traders and other simple license holders, and middlemen. As a result, wages and working conditions within this supply chain were opaque and difficult to confirm with any certainty. Workers often did not understand who they were working for or the specific terms of their employment.

Timber workers described informal processes of recruitment and hiring ranging from “we saw his truck and people would run to ask for work,” to “a friend told other friends and they travelled as a group to the employer.” Two interviewees reported that some people “had to pay to get a job,” but did not say if they experienced this first-hand.

All workers interviewed acknowledged that they knew they would be finding, cutting, or peeling *Nkula* logs. No contracts, conditions of work, or payment structures were provided by the trader or supervisor. Log loaders reported having been promised that they would be provided with a good salary and food and water, but the level of the wage had not been specified.

Log peelers reported significant differences in the level of pay promised during recruitment compared to what was received in practice.

SUMMARY OF FORCED LABOR INDICATORS: RECRUITMENT AND WORK AGREEMENTS

Forced Labor Indicator	Type of Worker Impacted
Situations in which the worker must perform a job of different nature from that specified during recruitment without a person’s consent	Timber workers (log peelers)

Wages and Earnings (Scenario 3)

Four workers interviewed reported that wage payments were often delayed by weeks or months. Interviewed workers did not express the belief that the wage delays were implemented with the intent to compel them to continue working, but that was their impact in practice. Other workers interviewed reported experiencing wage payment schedules that were “random.” One worker was paid in Brazilian currency (Reals), rendering his wage practically valueless, since most rural timber workers are among the “unbanked,” with no access to currency exchange. No explanation for wage irregularities was provided.

One worker reported that in December of 2018, his work crew still had not received any wages from the previous season. They returned in the hope of recouping lost wages and provided the trader with a truck of *Nkula* logs. They were told that the wood quality was too low, although the trader ultimately took the wood away on his truck, presumably for sale. The workers never received any payments.

Log peelers interviewed reported wages being paid daily, with rate of pay tied to the number of units peeled. Log peelers reported being promised 50 MZN (0.76 USD) per log peeled during recruitment but receiving as little as 20 MZN (0.30 USD) per log peeled in practice. Log peelers also reported experiencing irregular wage payments. While wage levels for log peelers and other timber workers interviewed were reportedly very low, researchers were unable to gather sufficient wage data to enable extrapolation to a monthly wage level and comparison to the legal monthly minimum wage. Therefore, while very low wages are suspected, this forced labor indicator was not indicated for these workers.

“We have to stay connected to the work while awaiting payment for fear of not receiving money if we leave here. Going to court is not an option because he (the trader) has money and we have nothing.”

– Chainsaw Cutter, Chiuta District (Male, Age 24)

All timber workers interviewed noted either declines in wages or increasing infrequency of payment over time, which researchers perceived to be associated with overharvesting and declining availability of *Nkula*. In 2014, according to one worker interviewed, the total compensation for a truckload of *Nkula* logs provided to the trader in the hybrid model was approximately 25,000-30,000 MZN (379 to 455 USD).¹⁹⁵ At the time of research, the same truck would only command approximately 6,500-7,000 MZN (98 to 106 USD).

SUMMARY OF FORCED LABOR INDICATORS: WAGES AND EARNINGS

Forced Labor Indicator	Type of Worker Impacted
Withholding of wages or other promised benefits	Timber workers

Hours (Scenario 3)

Hours were largely driven by tasks required on any particular day. Daily hours could be as long as 17 hours.

Health and Safety (Scenario 3)

No workers interviewed received safety equipment of any kind. A few workers, as was the case under other scenarios, complained of a persistent cough and alluded to an absence of health clinics. One of the log loaders discussed seeing log peelers with a cough severe enough to take them out of work for a week. Unless they returned, any wages owed would not be paid.

SUMMARY OF FORCED LABOR INDICATORS: HEALTH AND SAFETY

Forced Labor Indicator	Type of Worker Impacted
Work in hazardous conditions to which the worker has not consented, with or without compensation or protective equipment	Timber workers

Abuse and Harassment (Scenario 3)

Workers interviewed reported verbal and physical threats and abuse in the case of any grievances. Some workers described being “slapped” as a punishment.

Many workers reported that anyone who complained to the trader was simply told to quit because he could be easily replaced by new workers “from other cities.” This seemed to imply that employers had recruitment pipelines accessing workers in urban areas. Workers perceived that if they were to walk away from their engagement while waiting for payment, they would sacrifice all earnings due.

“The Police protected Chinese, not us workers. We stopped complaining to the police since it was known that they were on their side...”

– Log Peeler, Marávia District (Male, Age 43)

In several cases, workers went to the police to lodge grievances against the trader. Police generally sided with the trader and in some cases workers themselves were threatened with arrest.

SUMMARY OF FORCED LABOR INDICATORS: ABUSE AND HARASSMENT

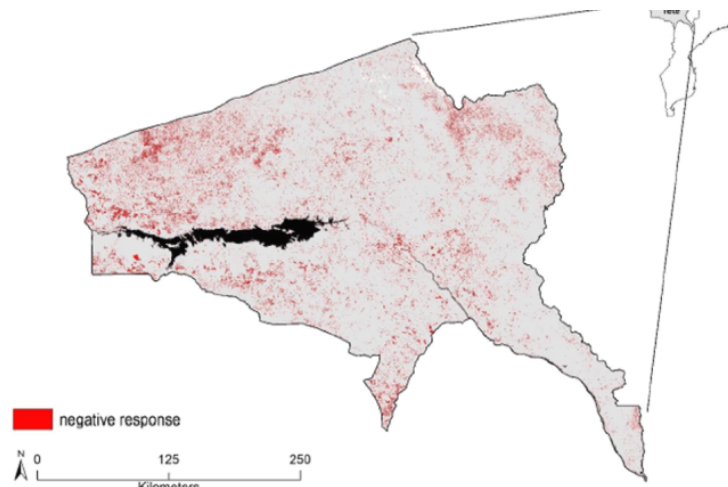
Forced Labor Indicator	Type of Worker Impacted
Abuse of workers’ vulnerability through the denial of rights or privileges, threats of dismissal or deportation	Timber workers

Environmental Consequences of Illicit Logging in Tete

Together national and provincial contextual factors have created enabling conditions for labor vulnerability and exploitation. Consequences to productive and protective forest functions in Tete generally and the study locations specifically had not been previously documented. Verité partnered with the University of Nottingham’s Rights Lab to analyze and model satellite and geospatial data to map the change in forest cover during the time period in which illicit logging is known to have occurred in Tete. Several findings relating to intersections with environmental and social factors should be noted. A full report and methodology used is provided in Annex 3.

By way of summary, possible forest loss and environmental degradation were explored for the years 2016 and 2019 for the whole of Tete province. Satellite data shows vegetation loss (inferred environmental degradation) within a relatively short time frame, as indicated by red on the map. It is important to note “hotspots” of loss in areas where Mozambique borders Zambia and Malawi. This would support theories of displacement of exploitation following “boom-bust” and “ban-lift ban” described in earlier context discussions, as well as worker interviews describing transport of logs across Zambia and Malawi borders for “log washing” prior to export out of Beira ports.

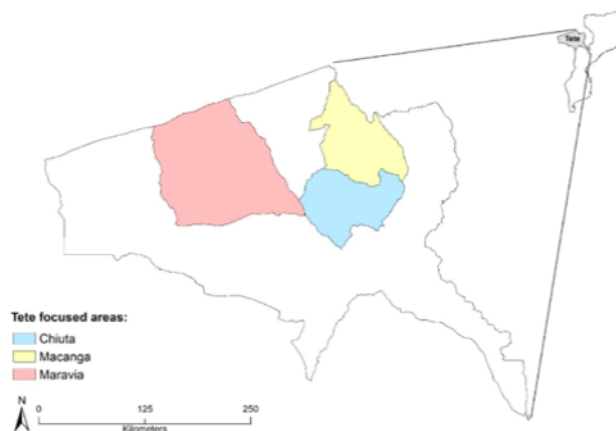
FIGURE 10. ORMALIZED DIFFERENCE VEGETATION INDEX (NDVI) CHANGE ANALYSIS – TETE PROVINCE 2016–2019



Source: University of Nottingham, Rights Lab¹⁹⁶

Trends in the normalized difference vegetation index (NDVI)¹⁹⁷ were further explored for areas of interest identified by Verité based on worker interview locations, reports of known illicit *Nkula* wood ‘rosewood’ timber extraction or reports of illicit transportation of logs. These areas included Chiuta, Macanga, and Marávia.

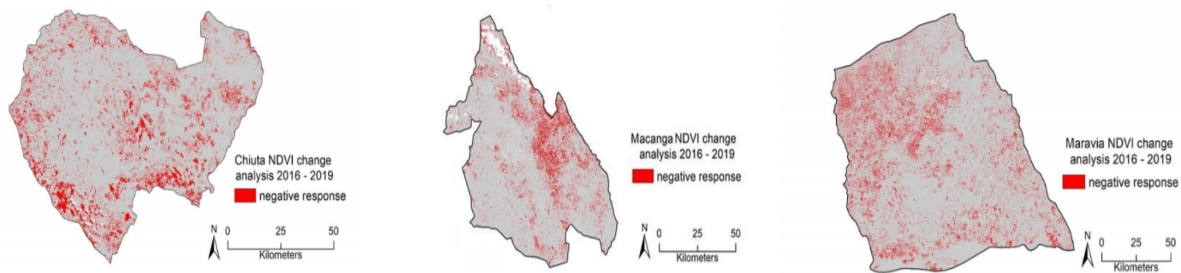
FIGURE 11. AREAS OF INTEREST FOR NDVI CHANGE ANALYSIS IN WORKER INTERVIEW LOCATIONS



Source: University of Nottingham, Rights Lab¹⁹⁸

The images below provide a change analysis map of forest cover for the years 2016 and 2019 for Chiuta, Marávia and Macanga. It is clear that these three areas have experienced landscape-scale environmental degradation in the last four years. While it cannot be inferred from this imagery that the cause of degradation was due at least in part to illicit logging of *Nkula* wood, this seems a reasonable hypothesis given the field data gathered by Verité concerning illicit logging activity in these areas during the time period.

FIGURE 12. NORMALIZED DIFFERENCE VEGETATION INDEX (NDVI) CHANGE ANALYSIS, CHIUTA, MACANGA AND MARÁVIA, 2016–2019



Source: University of Nottingham, Rights Lab¹⁹⁹

The methodologies employed generated findings that support suspicions of loss of productive and protective forest functions. Regarding *Nkula* specifically, photographs taken during field research were shown to conservation experts who indicated that the small diameter logs may indicate depletion of the species in case study areas. This temporal dimension of tree loss was further supported during worker interviews: Those who had been working in forest sector activities for between 18 months and two years indicated higher and more timely payments around 2016 than at the time of interviews in 2019, which could be due in part to depletion of the species, as well as increased regulation and protection of *Nkula* starting in 2016 and the eventual ban on logging, collection and export of *Nkula* in 2018.²⁰⁰

While the precise impacts of deforestation in the region have not yet been quantified, it is likely that the loss of tree cover will contribute to soil erosion and water table instability, worsening the impacts of future storms and cyclones. The impacts from deforestation – and associated increased impacts of storms – will continue to interfere with subsistence agriculture and disrupt the livelihoods and food security of local communities. The links between forest and environmental degradation and vulnerabilities to further poverty require further study. However, some immediate potential impacts on food insecurity are clear, as Tete is one of the most food-insecure areas in Mozambique and has a very long ‘lean season’ (when own-produced food stocks become increasingly depleted in the months leading to harvest time).

Both Verité and the Rights Lab assert that additional ground intelligence should further validate and elaborate on these initial findings. See **Annex 3** for the full report from the Rights Lab.

Tete Conclusions and Recommendations

Conclusions

Nearly all interviewed workers expressed the idea that logging was one of the severely limited options for them to earn an income. Some workers who had access to land were also able to support their families with subsistence farming, but this was not a given. Due to a lack of livelihood options and reliance on subsistence agriculture, local communities are particularly vulnerable to environmental degradation and the impacts of extreme weather events, which can be worsened by deforestation. Like community members already impacted by Cyclones Idai and Kenneth, increasing numbers of local people will be pushed into risky or exploitative work locally – including potentially in illicit logging – or will migrate elsewhere to survive.

Across various supply chain models, workers engaged in illicit logging are vulnerable to a number of labor rights abuses, including forced labor. Abuses present among illicit logging workers include deception about the nature and conditions of work (including wages, hours, and sometimes the legality of the work); work for low wages; abusive overtime without consent; withholding of wages; abuse and harassment; work in hazardous conditions without previous consent; and threats of denunciation to authorities. Children also reportedly participate in some illicit logging activities, including hazardous activities.

The logging supply chains in which these workers are engaged have had a devastating effect on

populations of *Nkula* and related species and the health of miombo forests in the province, the nation, and region in Africa. The impacts from deforestation – and associated increased impacts of storms – will continue to interfere with subsistence agriculture and disrupt the livelihoods of local residents.

Corruption and weak governance are key enabling factors that have several implications for both trafficking in persons vulnerability and risks of environmental degradation. Corruption enables logging to occur without proper licensing and therefore without oversight, which allows employers and/or supervisors to continue to exploit workers – including children in some cases. When workers seek to express grievances, a combination of potential corruption and a lack of capacity amongst local law enforcement officials means that workers have no recourse in the case of abuse – in fact, they themselves might be criminalized, further deterring workers from expressing any grievances about their work. Corruption and lack of adequate oversight also allow logging operators to access land in the first place, often in spite of community use, contributing to displacement of local populations and social pressure on residents to accept logging activities.

The case study also highlights the degree to which shifting consumer demand can rapidly necessitate new social and environmental frameworks related to harvesting a species of tree that was previously left off development and conservation agendas. *Nkula* exploitation

ramped up in Mozambique so quickly that it was never included in government efforts at mapping distribution and volume of commercial tree species. *Nkula* harvesting was banned in 2018 in Mozambique and was only recently listed in fall 2019 as an “Annex 2 species” under CITES.²⁰¹

While the Mozambican government did not have adequate time to build a protective framework around *Nkula* specifically prior to the start of overharvesting, the country’s existing general administrative requirements for licensing of logging operations, particularly commercial concession operations, are thought to be relatively comprehensive. However, those administrative requirements have not stopped motivated supply chain actors from finding ways to fraudulently take advantage of the current system. For example, a company was identified in case study research that secured a legal concession license in one region but expanded operations out to other areas and species (including *Nkula*). Field research also identified non-Mozambican nationals who secured a simple license through a Mozambican partner (use of simple licenses is limited to Mozambican nationals) and coordinated multiple work crews to conduct high-volume logging that would not otherwise be acceptable under a simple license. The result of these “workarounds” is an even greater level of supply chain opacity and lack of accountability. Even in the face of a 2018 government ban on all *Nkula* harvesting, operators were able to secure “authorizations” from government bodies and continue logging.²⁰²

Finally, in the course of expert consultations to inform and validate findings, Verité researchers found that while there are rich communities of experts focusing on specific relevant issues such as deforestation/environmental degradation,

corruption, governance, and land rights, these stakeholders do not always coordinate their agendas between themselves. More notable for the purposes of this research, a focus on labor rights is typically absent from these conversations. Where a labor rights or anti-trafficking perspective is present, it may not adequately integrate broader issues of governance and the environment. Similarly, broader environmental and governance agendas could likely benefit from a strategic consideration of how integration of labor and social concerns could support progress towards their primary missions.

Recommendations

The following recommendations seek to address some of the root causes of vulnerability for trafficking in persons and other labor rights abuses related to illicit logging in Tete Province in Mozambique.

Recommendations for the Government of Mozambique



The Government of Mozambique has many ways in which it addresses the protection and prevention of trafficking in persons (TIP), including regular meetings of national, provincial, and district level working groups on TIP; training for the labor inspectorate on TIP identification and referral; and other TIP awareness activities and outreach activities.²⁰³ The following recommendations are made for ways in which TIP prevention can be bolstered, in light of Verité’s field findings:

- Finalize and implement the National Action Plan on Trafficking in Persons and the victim protection and trafficking prevention provisions of the 2008 Law on Preventing

and Combating the Trafficking of People.²⁰⁴

- Include sector-specific indicators of vulnerability to trafficking-in-persons—including in illicit logging – as part of efforts to develop a system to identify trafficking victims among vulnerable populations and to finalize and fully implement a national referral mechanism.
- Train law enforcement and labor and environment inspectors to recognize the signs of workers coerced or deceived into engaging in illicit activities and to avoid further criminalization of those workers.
- Given the current lack of avenues for workers in illicit sectors to express grievances or access assistance, develop and implement a national and/or regional grievance mechanisms available to these vulnerable populations.
- Ensure that public officials who are involved or complicit in trafficking crimes are investigated and prosecuted.

Mozambique's National Action Plan to Combat the Worst Forms of Child Labor sets out training for labor inspectors and law enforcement officials on identifying and preventing the worst forms of child labor. Given the findings that children perform log peeling in timber yards and anecdotal reporting of unaccompanied minors working in "slave like" conditions in timber yards near the Zambian border, Verité recommends that the Government of Mozambique investigate these claims, and

- Bolster capacity building and resourcing for labor inspectorate procedures to identify victims of child trafficking.
- Bolster capacity building and resourcing for law enforcement and prosecutors to identify victims of child trafficking, engage in reporting methods to safeguard victims and improve the government's ability to

prosecute human trafficking cases.

In addressing the proliferation of illicit logging and associated deforestation, the government of Mozambique should seek to address the following:

- Reexamine the simple license program (including authorizations) and evaluate existing loopholes for illicit logging, as well as the impact on communities from being pressured into accepting illicit logging activity associated with simple licenses.
- Consider tracking geospatial locations of simple licenses to ascertain whether they may be being used improperly.
- Where the government is participating in anti-corruption efforts, such as the development of an anti-corruption strategic road map with the UNODC,²⁰⁵ include forms of corruption that enable both deforestation/illicit logging and vulnerability to trafficking in persons.

Recommendations for Countries Importing Timber and Wood Products from Mozambique



Chinese markets are the main destination for *Nkula* due to its look-alike qualities to rosewood, and the vast majority of rosewood lookalike species imported by China remain in the country and are not re-exported elsewhere as finished wood products.²⁰⁶

The US Lacey Act, EU Timber Regulation (EUTR), and Australia's Illegal Logging Prohibition Act ban any imports of illegally harvested timber. In December 2019, in the first revision to its Forest Law in more than twenty years, China banned the purchase, process or transport of illegal timber. These revisions will come into effect in July 2020.^{207 208} This landmark development in

China's regulation of timber could represent a critical step in reducing the import of illicitly logged of tree species. China should:

- Ensure robust implementation and enforcement of these new prohibitions in the Forest Law.
- Demand transparency and accountability from timber importers, requiring importers to disclose due diligence efforts to prevent wood purchases from contributing to illegal logging and environmental degradation.
- Exercise sufficient oversight of importers to identify violations where they occur.
- Levy effective penalties to disincentive further import of protected species of wood.



Recommendations for the Private Sector

Verité field research detected evidence that a commercial company with a concession elsewhere in Mozambique had required employees via deceptive means to engage in illicit logging of *Nkula* wood in Tete Province. This company was known to export to markets in Europe, Asia, South Africa, and the United States.

Environmental-focused international organizations such as Forest Trends have made recommendations to increase supply chain transparency and industry accountability among private sector actors in forestry supply chains.²⁰⁹ The implementation of the following recommendations will also help legally operating private sector forestry actors in Mozambique to ensure TIP vulnerability is not present in their operations or supply chains:

- Continue to bolster systems to track wood as it moves along each step in the supply chain, ensuring the origins of timber supply, that it has been certified through credible

programs where possible, and that it can be legally verified at every step of the supply chain.

- Explore the potential to integrate collection of indicators of TIP and other labor abuse as part of tracing efforts.
- Require suppliers of wood or wood products to provide evidence that they do not engage in trafficking in persons or in recruitment or management practices that create risk of trafficking in persons, in their own operations or those of their subcontractors.

Recommendations for Certifiers

Mozambican companies certified through forest certification schemes are currently few in number²¹⁰; and demand for certified wood in China, the primary market for illicitly harvested *Nkula*, is low.²¹¹ Some experts have advised that certifiers should consider reducing or subsidizing the cost of certification in developing countries where uptake of certification initiatives is still early.²¹²



Verité's field research found evidence of labor vulnerability and abuse in illicit logging activity and that some timber workers participating in illicit logging of *Nkula* wood were deceived or coerced into the work by a legal concession elsewhere in Mozambique, as well as potential evidence that illicitly harvested logs were intersecting with more formal supply chains in Mozambique. Based on these findings, the following recommendations are offered for certifiers operating in Mozambique:

- Ensure that the ILO's fundamental labor standards are successfully integrated into chain of custody requirements.²¹³
- As part of log tracing efforts, ensure that workers at facilities being evaluated for certification have not been deceived or

forced to participate in the illicit logging, transport, or processing of protected species of wood.



Recommendations for Local and International Civil Society Organizations

Civil society organizations working on root cause issues of deforestation or vulnerability to trafficking in persons and other forms of labor exploitation can consider:

- Supporting capacity building efforts for local law enforcement to promote protection for and prevent criminalization of local workers

engaged in illicit Nkula harvesting.

- Encouraging and supporting the development and operation of a national or regional trafficking-in-person hotline.
- Collaborating with peer organizations working on separate but related issues to encourage a more intersectional approach. For example, international organizations supporting anti-corruption efforts can draw linkages between corruption, deforestation, and trafficking-in-persons vulnerability in order to strengthen root cause identification and the development of integrated interventions and programming.



Case Study: Road Construction in Niassa Province

The remote Niassa province in Mozambique is an area rich with natural resources – including the Niassa National Reserve, one of the largest protected wildlife areas in Africa – with large swaths of miombo forests²¹⁴ alongside gold²¹⁵ and mineral mining opportunities.²¹⁶

At the same time, the relatively small local population – Niassa is the least populated province in the country²¹⁷ – has struggled with a poverty rate that increased from 33 percent to 60.6 percent between 2009 and 2016.²¹⁸

Factors underpinning the poverty experienced by residents include limited economic opportunities outside of agriculture²¹⁹ and a lack of services and infrastructure.²²⁰ Climate change and other environmental disasters such as cyclones and flooding²²¹ – and the attendant loss of livelihoods²²² and food security²²³ – have also contributed to the vulnerability of local people.²²⁴ With few economic options, reliance on small-scale agriculture is widespread, with intercropping of corn, cassava, peanut, and beans common.²²⁵

Niassa’s compelling wealth of natural resources and relative underdevelopment has made it a prime target for regional and foreign investment²²⁶ and infrastructure development to increase connectivity to nearby transport hubs.²²⁷ However, while development of infrastructure projects like this may help facilitate economic growth opportunities, they can also contribute to negative social and environmental impacts for surrounding communities.²²⁸ International donors, such as the World Bank, provide a suite of “donor safeguards” or policies for due diligence that are intended to “identify, avoid, and minimize harms to people and the environment” in the course of infrastructure project development and construction.²²⁹

This case study examined the impact of these dynamics – with particular attention to the intersection of labor vulnerability and environmental degradation – in the construction of the Cuamba-Mandimba-Lichinga section of the N13 in Niassa, part of the Nacala Road Development Corridor.²³⁰ The Nacala Road Development Corridor encompasses a set of development projects to improve transportation infrastructure primarily funded by the African Development Bank (AfDB), the Japan International Cooperation Agency (JICA), and the Government of Mozambique, with foreign private sector contractors primarily overseeing the implementation, including provision of labor.²³¹

Methodology

Verité conducted rapid appraisal-style field research to assess labor conditions in large-scale road construction in select locations in the Niassa Province, as well as environmental degradation and associated impacts on surrounding communities. Field research consisted of semi-structured qualitative interviews with workers, community members, and other local and international experts. Respondents were selected using purposive snowball sampling. A review of relevant literature was also conducted to ground and validate findings. Of the 45 individuals interviewed, 15 were former or existing road workers, some of whom originated from other provinces such as Nampula and Sofala; 21 were Project Affected Persons (PAPS), six were from the civil society sector, and three were from local government.

Field data collection for this case study was conducted primarily between March - April 2019. Interviews were conducted in areas of Cuamba, Lichinga, and Mandimba. Researchers utilized a semi-

structured interview tool to conduct qualitative research. Individuals were selected for interviews using snowball sampling. Interviews were conducted one on one and in focus group discussions. Ongoing issues related to labor complaints, poor road quality in certain road sections, and security considerations warranted rapid entries and departures to interview sites.

During the Field Research phase, researchers had to contend with challenging access issues as well as potential security threats from actors threatened by research activities. Researchers and workers were vulnerable to possible surveillance and retribution. In order to avoid attracting the attention of authorities, researchers generally avoided spending more than a few days at a time in any single research locale. Instead, the researchers cycled through different villages and districts quickly. Worker interviews were conducted in places with sufficient privacy where workers could speak freely, away from oversight of employers or others.

Due to the small number of worker interviews and the lack of a scientific sampling strategy, this sample cannot be taken to be representative at a national or sector level. This rapid appraisal research was not intended to determine prevalence of labor violations, but rather to uncover risks that should be further explored by more in-depth research.

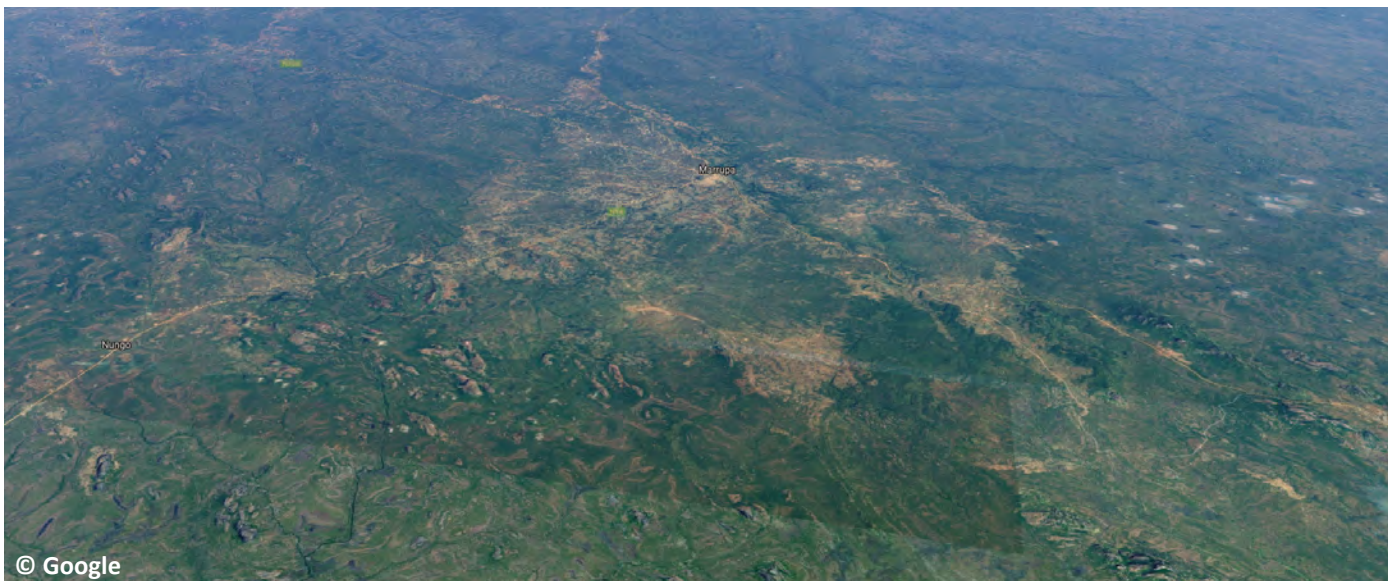
Niassa Province Contextual Background

Niassa province is in the north of Mozambique, and the province borders Tanzania and Malawi. It is the largest province in Mozambique by area but the third least populated, as of the 2017 census.²³²

Governance, Economic Development, and Social Conflict

Poverty rates in Niassa are high, with over half of the population living below the poverty line in 2016.²³³ The province is highly dependent on small-scale, rain-fed agriculture.²³⁴ Farms are typically

AERIAL VIEW NIASSA PROVINCE IN MOZAMBIQUE



under two hectares, and farmers grow crops including corn, cassava, and beans.²³⁵ The natural disasters that have plagued Mozambique as nation have had severe impacts on the residents of Niassa. Cyclones in recent years have caused road destruction, property loss,²³⁶ food insecurity,²³⁷ road destruction, and disruptions to power and transportation in the region.²³⁸

These conditions have further entrenched dynamics in which residents of northern regions of Mozambique – Muslim populations in particular – have experienced political exclusion and social marginalization. Over the past three years, a variety of grievances in the north of the country, centered in Cabo Delgado province, have multiplied.²³⁹ Armed group conflict, driven in part by the rise of religious extremism, has increased in the region since 2017, although acts of violence have been primarily limited to Cabo Delgado thus far.²⁴⁰

Growth corridor development is a significant driver of infrastructure development in Mozambique, especially in the northern provinces, including Niassa.²⁴¹ The Nacala Road Development Corridor, for example – which is the context for this case study – was intended to improve transportation and trade in the region.²⁴² China has also been playing an increasingly important role in the infrastructure sector in Mozambique through its Belt and Road Initiative (BRI).²⁴³

Role of Forests and Natural Resources

Niassa is home to the Niassa National Reserve, one of Africa's largest protected areas, located in the north of the province and extending across the border with Tanzania. It contains a large swath of miombo woodland.²⁴⁴ Wildlife species in the reserve include high value species like elephants and lions. The presence of diverse wildlife has also attracted poaching, with elephant species in the reserve declining by more than 70 percent between 2009 and 2015.²⁴⁵

The flow of the ivory trade in the area has reportedly helped strengthen criminal networks and contribute to the growth of profitable sectors that contribute to environmental degradation such as small-scale mining and bushmeat poaching.²⁴⁶ Mozambican ivory has historically been smuggled across the border into Tanzania until recent tighter monitoring in Tanzanian ports encouraged smugglers to seek alternate routes. This has resulted in a fortification of the smuggling routes through Cabo Delgado to the ports of Pemba and Beira.²⁴⁷ Some observers have noted that profit from smuggling opportunities may have helped fund the rise of extremism in Cabo Delgado.²⁴⁸

Productive Forest Functions

While data is not available at the provincial level, countrywide estimates show that income from Mozambique's miombo forests, the type of forest located in Niassa, contribute about 20 percent of household cash income in Mozambique and 40 percent of the household subsistence (non-cash income).²⁴⁹ Non-timber forest products (NTFPs) are a significant livelihood source for the rural poor, and NTFP trade occurs primarily in the informal sector.²⁵⁰ NTFPs can be collected from the forest or made from forest material, and can include honey, medicines, fuelwood, and handicrafts.²⁵¹ NTFPs collected from the forest can also meet nutritional needs and contribute to food security.²⁵²

Protective Functions of Forests in Niassa

The Niassa National Reserve is Mozambique's largest protected area at 42,300 km² and is one of Africa's preeminent wilderness areas. This National Reserve, together with a neighboring protected wilderness area in Tanzania, is one of the largest regions of protected miombo woodland in Africa. These lands provide important carbon storage and sequestration capability as well as habitat for many animal and plant species.²⁵³

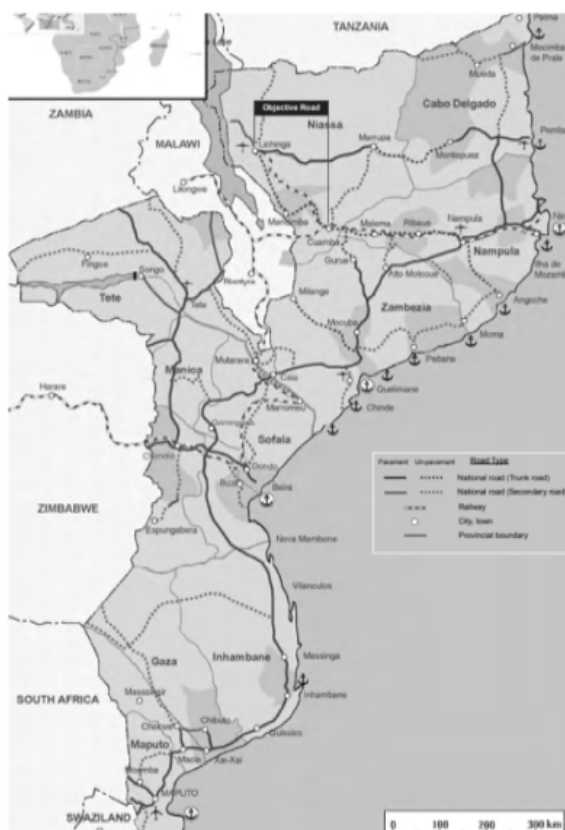
Residents of Niassa are largely dependent on rain-fed agriculture for survival.²⁵⁴ The productivity of rain-fed agriculture relies on the health of the area's hydrological system,²⁵⁵ and the health of an area's hydrology is greatly enhanced by the presence of forests. Trees help to retain soil moisture as well as stabilize rainfall patterns, which inhibits drought and flooding. Forests also perform water filtration, enhance soil quality, and inhibit runoff and erosion—all services critical to agricultural productivity.²⁵⁶ Like other provinces in Mozambique, Niassa has already experienced a change in its agricultural productivity as a result of its compromised hydrology, with Niassa farmers in 2015 reporting a 24.5 percent loss in production as a result of drought and a 24.9 percent loss in production as a result of flooding.²⁵⁷ As 99 percent of farmers produce on a subsistence basis,²⁵⁸ loss in their farm's productivity does not result in revenue loss but rather in a loss to their household's food security.²⁵⁹

Rehabilitation of the Cuamba–Mandimba–Lichinga Section of the N13

The Cuamba-Mandimba-Lichinga section of the N13 road is approximately 320 kilometers long. The rehabilitation of this section of the N13 road (hereinafter referred to as the N13 Project) was financed by the African Development Bank (AfDB), the Japanese International Cooperation Agency (JICA) and the Government of Mozambique.²⁶⁰

The impetus for the road project emerged in the Government of Mozambique's 2006-2009 Action Plan for the Reduction of Absolute Poverty (PARPA II: 2006 – 2009), which indicated that the limited access to roads and other socio-economic services was a cause of the country's poverty.²⁶¹ The plan gave priority to improving infrastructure in areas with high potential for agricultural production. The Government of Mozambique, acting through the National Roads Administration (ANE), subsequently made requests to international financial institutions including the African Development Bank and Japanese International Corporation Agency (JICA) to improve transport infrastructure and for strengthening the institutional capacity of the roads sector.

FIGURE 13. LOCATION OF CUAMBA-MANDIMBA-LICHINGA ROAD PROJECT IN MOZAMBIQUE²⁶²



The N13 Project has linked major cities in Niassa Province. Formerly a dirt road, it has now opened up transportation routes to over 500,000 local residents. Part of the broader Nacala Development Corridor, modernizing the road provides a key link to the border of Malawi as well as the ports of Nacala and Pemba.

Road development entailed tasks such as paving and sealing asphalt; installation of signs, posts, and guardrails; creating embankment slopes; and general obstacle clearing such as removal and reinstallation of crossing railway tracks, removal of pipes, etc.²⁶³

Role of International Donor Safeguards

Both of the international donors – AfDB and JICA – have “safeguard policies”²⁶⁴ that are intended to mitigate potential social and environmental harm linked to funded projects. These policies

mandate a comprehensive financial package for displaced people and plans for resettlement compensation, along with an obligation to bring in environmental and social impact specialists where host institutions lack capacity.²⁶⁵ While the AfDB maintains its own suite of safeguard policies, JICA as well as many other donors refer directly to the World Bank’s Safeguard Policies.²⁶⁶ The World Bank Safeguards are typically regarded as the most prominent example of this type of due diligence framework.

A wide range of social topics are covered by safeguard policies, with safeguards focused on both surrounding community wellbeing as well as working conditions for contracted workers directly implementing projects. Specific topics included in World Bank policies include impacts on local population migration; involuntary resettlement; local employment and livelihoods; land use; special assessment for particularly vulnerable groups such as indigenous populations, women, and children; and labor conditions for employed workers. Sub-topics concerning labor conditions include, inter alia, health and safety, wages, hours, harassment/abuse, non-discrimination, and freedom of association. Safeguards generally have specific prohibitions on child labor and forced labor.

Environmental topics covered by safeguard policies such as those utilized by JICA²⁶⁷ and AfDB include tracking greenhouse gas emissions, preservation of biological diversity, and maintenance of core ecological functions of areas.²⁶⁸

Donor safeguard policies are often not fully implemented in practice, leading to stakeholder criticism.²⁶⁹ Internal evaluations conducted by the World Bank support this impression, highlighting an urgent need to strengthen implementation, supervision, monitoring, and reporting to improve the effectiveness of the World Bank’s social and environmental policy framework.²⁷⁰

2018 World Bank Donor Safeguard Framework

In 2018 the World Bank published an updated Environmental and Social Framework (ESF) with the intention of stronger management of the World Bank and Borrowers around environmental and social risks of projects. The ESF offers broad and systematic coverage of environmental and social risks and makes important advances in areas such as transparency, non-discrimination, public participation, and accountability—including expanded roles for grievance mechanisms. Relating to labor, the ESF has mandates to: promote safety and health at work; promote the fair treatment, nondiscrimination, and equal opportunity of project workers; protect project workers, including vulnerable workers such as women, persons with disabilities, children (of working age, in accordance with this ESS), and migrant workers, contracted workers, community workers, and primary supply workers, as appropriate; prevent the use of all forms of forced labor and child labor; support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national law; and provide project workers with accessible means to raise workplace concerns.²⁷¹

Safeguard Implementation in the Niassa N13 Road Context

There are complex intersections of responsibility around implementation. In 2012 AfDB and JICA, through the Government of Mozambique National Roads Authority (ANE), published an Environmental and Social Impact Assessment (ESIA)^{272 273 274} and a Resettlement Action Plan (RAP) for Mandimba, Cuamba and Lichinga.²⁷⁵ These documents outline the project’s risk management strategy and integrate findings from risk assessments. Together, they outline a chain of responsibility for development, planning, implementation, and monitoring of social safeguards for each phase of the project. Lead actors assigned roles in the project are assigned roles related to safeguard implementation at different phases.²⁷⁶

Institutional oversight of safeguards related to the N13 Project are summarized below.

INSTITUTIONAL OVERSIGHT OF SAFEGUARDS RELATED TO THE N13 PROJECT

Project Phase	Actor/Institution	Safeguard Implementation Role
Planning and Design	National Road Administration (ANE); Ministry of Public Works and Housing (MOPWH)	Conduct assessment of alignment between relevant donor safeguards and national legislation. Select private contractor.
	Private contractor road designer	Conduct planning around environmental mitigation measures.

Project Phase	Actor/Institution	Safeguard Implementation Role
Active Construction	ANE	Oversee contractor relationships, including oversight of implementation of safeguards.
	Private contractor implementers	Responsible for compliance with all relevant policies including community/social protection, environmental protection, and upholding labor rights. (Note that this is the responsibility of the contractor at any point in the project if activities expand beyond construction phase).
	Donors	Conduct audits on contractor practices against safeguard policies.
Availability for Use	ANE	Responsible for leading efforts to mitigate impact on communities such as replanting trees, addressing draining issues, and facilitating and necessary resettlement of compensation of impacted people.
Post-project Evaluation	International Donors	Complete evaluation report on systems and outcomes of safeguard compliance. As stated in project documents, “provide close monitoring and evaluation of the project during implementation through regular follow up review and supervision missions.” ²⁷⁷
	All parties	Review findings and take appropriate steps to address gaps, weaknesses, and challenges in future projects.

On the side of the Mozambican government, the National Road Administration (ANE), which reports to the Ministry of Public Works and Housing (MOPWH), is the lead for overseeing the N13 Project. Under the terms of funding by JICA and the AfDB, the ANE is thereby responsible for a number of roles related to safeguard policy oversight, including the designation of a Project Implementation Team (PIT). The PIT is mandated to have a dedicated disbursement officer, procurement specialist, contracts administration officer, monitoring & evaluation officer, and environmental and social specialist. The ANE is responsible for the monitoring and evaluation of the project, including the labor and environmental safeguards, through the PIT. Once in place, the ANE procures the services of a specialized engineering firm for the supervision of the construction works. In the case of the N13 project, several foreign companies were involved in construction design and implementation.²⁷⁸

Findings on Labor and Other Vulnerabilities for Workers on the Cuamba–Mandimba–Lichinga N13 Project

Sampling and Worker Demographics

Field researchers interviewed workers involved in the construction of the Cuamba–Mandimba–Lichinga section of the N13 road (referred to herein as the N13 Project). A total of 15 workers were interviewed, most of whom were men between the ages of 30 and 43. Two workers were female.

The interviewees were largely long-time residents of villages adjacent to the N13 road, although researchers noted that this was due to homogeneity of seeds for snowball sampling and did not accurately reflect the makeup of the worker population overall.

In addition to local workers, researchers identified several populations of migrant workers present in the road construction. Internal migrants from Nampula, Zambezia, Cabo Delgado, and Tete provinces. Workers and community members reported that Chinese and Indian contractors were provide specific services such as laying cement²⁷⁹ and reportedly employed Chinese and Indian workers in supervisory or administrative positions. There was also anecdotal reporting that the road project drew migrant workers from Malawi, Tanzania, and Zimbabwe.

Interviewees could be classified as “general laborers” – that is, workers without a more specialized technical skillset – and workers with specific skill sets such as mechanics, locksmiths, cylinder operators, carpenters, plumbers, electricians, and cement workers. Security guards were present in some cases as well.

A number of interviewees were engaged specifically in constructing “road yards” – areas where building materials were stored and in which workers resided during active construction. These workers would therefore be at a certain location constructing the road yard in advance of larger numbers of workers and administrative staff arriving to that location.

Supervision and Management Structure

Work crews are typically supervised by a “crew chief.” The crew chief is overseen by a manager from the private sector company contracted to complete the road. Workers interviewed reported that they had experience with managers and crew chiefs of both Chinese and Mozambican nationalities.

FOREST CLEARED FOR HIGHWAY CONSTRUCTION. TETE PROVINCE, MOZAMBIQUE



© Estacio Valoi

Entry into Sector: Recruitment, Application, and Hiring Processes

For most interviewees, working in road construction was motivated by the absence of other employment or livelihood opportunities in communities of origin. One worker interviewed expressed the sentiment that he was aware that road jobs had “low pay and bad working conditions” but felt that he had no alternative. Another worker stated that he sought employment in road construction as a direct result of losing his land and crops due to displacement by the road project. He stated that he did not receive any compensation or resettlement assistance for the loss of land. He told interviewers that when displaced landowners complained, they were offered jobs as compensation. Workers from the Nampula region reported that they and others from Nampula had previously worked for contractors or subcontractors associated with construction in Niassa on other projects. They followed the construction company to the N13 corridor because there were no other opportunities available in their home region.

“There was no promotion of jobs. The community members just saw them [tractors] arriving and destroying fields. They never came to talk to the community - even still, there has been no compensation/ acknowledgement of the lands destroyed. The community leader is tricked, he is told the company wants so many people, but then none are hired. . . maybe the community leader even knew that, but who knows? In a community of about 3000 people only 2 are employed by the road company.”

– Job Applicant, Muita, Cabo Delgado Province (Male, Age 35)

Recruitment experiences varied among workers interviewed. Workers interviewed who were recruited in early stages of construction reported that the recruitment and management process was largely informal and ad hoc. Workers hired later into the construction reported more formalized recruitment and hiring processes. Mechanisms for learning about the work prior to hiring included: advertisements on the radio, word of mouth via social networks, and visually witnessing work and identifying employers. One worker interviewed noted that a leader in his village had played a role in helping the worker secure a position by acting as an informal “middleman” between the worker and employer.

Once potential workers heard of job opportunities, barriers to application could be onerous, particularly for rural individuals. Interviewees described a process in which the contractor or subcontractor would arrive in communities along the roadway, announce vacancies, and request that interested candidates submit applications and required documents. Required documentation for the application included the submission of bank account information, although 80 percent of the adult population in Mozambican does not have a bank account.²⁸⁰ Many workers also lack the Mozambique

Single Tax Payer Identification Number (NUIT) – the application for which, in turn, requires obtaining a birth certificate, a passport, a voter identification card and a driver’s license. While acquiring this paperwork is officially “free,” workers reported that it is not uncommon for civil servants to request petty bribes to facilitate the process. The requirements for formal documentation acted to discourage the hiring of rural local workers, who were less likely to have access to the full suite of documentation required.

“They ask for a lot of documents, which can cause difficulties for potential workers. This can cause debt. ... There are many in the community that would like to work, but they get a job because of they can’t get the documents they request (ID, NUIT, and bank account). The ID they managed, but when they want the NUIT they go to the bank and they say ‘come tomorrow, come tomorrow.’ I’ve been doing this for 5 months now, travelling and paying to get a NUI.”

–Farmer and Job Applicant, Mandimba (Male, Age 26)

“If I had money I could be working already long ago. Because this is so close from home, if I had a job I would be feeling well with my family. But it’s very hard to get in because they are charging us money we don’t have to pay for that job. So, we can’t get food for ourselves and also money for that...”

–Job Applicant, Cuamba (Male, Age 32)

For workers without prior relationships to the employer, the wait between application and hiring could be lengthy, even for successful applicants. Roughly 25 percent of workers interviewed reported paying bribes of between 1,500-3,000 MZN (22.73-45.45 USD) to contacts who already had positions to facilitate and speed up the hiring process. These currently employed local Mozambicans seem to act as informal “gatekeepers” for access to jobs. As one worker interviewed reported, “Only people with friends on the inside get in. They call their friends, [their friends] ask them to pay 2-3,000 MZN and then they get in.” That expense is prohibitive for many potential workers. One third of interviewees stated that they had had to take informal loans from their own networks to finance costs associated with their application. While these fees and costs were not reported to have been imposed by the employer and are therefore not indicative of forced labor, they act to increase the financial burden on already vulnerable workers.

Deceptive Recruitment

Workers interviewed were typically provided only verbal information about working conditions. Some workers interviewed reported that they had been verbally promised benefits that did not materialize upon beginning work. For example, workers from Nampula who had previously worked for active contractors reported that they were promised subsidies for accommodation. These subsidies were not ultimately provided, which cost workers an estimated additional 20 MZN (0.30 USD) per day for which they had not originally budgeted. This created a great financial strain for these workers, who were responsible not only for their own upkeep but also to send money home to their families.

“We do have a contract, but it is a very uncertain one because we have no rights. It is normal to be expelled without being paid, even for those with a contract.”

– Carpentry Operator in Mandimba (Male, Age 31, from Nampula)

Workers interviewed reported that they did not receive comprehensive information about wages and salaries prior to beginning work. They reported that they were not given full information about the tasks and activities to which they would be assigned. For example, one driver stated that in addition to driving, he was expected to participate in arduous manual tasks such as loading cement. Workers also reported not having been provided with transparent information about the distances between worksites, road yards and their homes and the time it would take to walk between these locations. One worker had been promised transportation during recruitment that was not forthcoming upon arrival at the job.

Contracts and Work Agreements

Workers interviewed typically did not receive contracts until well after beginning their jobs. Some workers had still not received contracts at the time of the interview with Verité researchers. For example, workers interviewed near Cuamba had never received or even been promised a written contract. Other workers reported having been promised a contract at a later date. When these contracts were received, they typically did not contain concrete relevant details such as salary information.

Workers with a previous relationship to their employer more frequently described having some form of written contract. Even in these cases, the contracts provided did not contain basic information such as salary. These written contracts were often described as “temporary”. When workers were questioned by interviewers as to their understanding of the role of these “temporary contracts,” workers speculated that they were a means for the employer to delay any commitment to the worker.

Workers were frequently denied access to copies of their contracts and potentially faced retribution for simply requesting access. One worker reported that his salary was reduced by his employer by 20 MZN (0.30 USD) per day upon moving from Nampula to the Niassa area; he interpreted this as a punitive action in response to his persistent requests for a copy of his contract.

SUMMARY OF FORCED LABOR INDICATORS PRESENT:
ENTRY INTO THE SECTOR, RECRUITMENT, AND WORK AGREEMENTS

Forced Labor Indicator	Type of Worker Impacted
Situations in which the worker must perform a job of different nature from that specified during recruitment without a person’s consent	General and skilled laborers

Wages and Earnings

Wage arrangements for workers interviewed varied. The monthly minimum wage for the building industry is 6,135 MZN (92.95 USD).²⁸¹ At the higher-wage end of the spectrum were more technically skilled workers such as machine operators, who reported earning a base salary of approximately 7,000 MZN (106 USD) per month plus overtime pay. Carpenters, mechanics, plumbers, and electricians interviewed reported wages in the range of 2,000-4,000 MZN (30.30-60.60 USD) per month.²⁸² Flag holders, tradespeople, and mechanics cited wages of between 4000- 6000 MZN. It was not uncommon for cement workers to earn only two-thirds if the minimum wage, with average earnings at 4000 MZN. Workers commonly asserted that their wages were insufficient for either their skill level or effort. It is important also to note that many workers were working on sections of



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the road away from their homes and were needing to support themselves and send money home to their families.

No workers interviewed knew how their wage was calculated, and workers often lacked clear and objective wage benchmarks; a few workers noted that wages were determined by the “strength” of the employee as opposed to his skill level or time with the company. One worker saw a decrease in his salary after having been transferred from Nampula and reported that he was not told why his salary decreased nor was he given advance warning before his transfer.

“There is a clear disrespect of human rights here. We had anonymous complaints of workers in Mandimba. At first, I was so happy to see youngsters having an opportunity to work. They were moving around a lot. They went to Massangulo and then to Cuamba. They talked to me about their work pressures—too much work, disrespect and little time to eat. But they have no notion that they have rights as workers. They need to earn money — not matter what the cost.”

—Community Member, Mandimba District (Male, age unknown)

The majority of workers interviewed had been promised raises at the time of hiring that had not materialized as of the time of field interviews. For a number of workers, the lack of the promised raise contributed to personal financial situations in which they resorted to borrowing from friends or other members of their network. Although these loans were informal, they could reportedly incur interest at rates up to 40 percent, leaving some workers in situations of debt. Workers on the lower end of the wage spectrum also reported that wages were not sufficient to support their families. At the same time, the time required pulled workers away from their subsistence agricultural crops, so some workers interviewed reported concerns about their family’s food security.

Wage Deductions and Financial Penalties

Twenty-five percent of interviewees described some type of deduction from their pay. Several workers interviewed reported wage deductions for disciplinary infractions such as “not working well,” “talking too much,” “voicing complaints,” “unhappiness,” and “upsetting [a] superior.” These types of infractions typically came with a deduction of 10-20 MZN (0.15 – 0.30 USD) per day. One worker reported that workers who are one minute late for a shift can have one hour deducted from their daily wage. Lost or damaged equipment/supplies were also sometimes deducted from worker pay. For example, one employee was deducted 5,000 MZN (75.75 USD) when a window of a gravel truck broke. Another worker reported being penalized 10,000 MZN (151.50 USD) for dropping a metal piece onto a car battery. A missing gasoline can warranted a deduction of 100 MZN (nearly a day’s work for some workers) for an entire crew. Some workers also reported deductions for equipment and uniforms such as jackets, helmets, and boots.

SUMMARY OF FORCED LABOR INDICATORS: WAGES AND EARNINGS

Forced Labor Indicator	Type of Worker Impacted
Work with very low or no wages	General laborers

Hours

Some workers reported longer hours than expected stating that when they finished their assigned task, they would simply be moved along to another task. Workers noted the potential that they would be terminated if they did not accept whatever task is assigned and see it through to completion regardless of the time or hours worked.

Specific hours worked reported by interviewees varied. Some reported a schedule in which they worked from 6:30am – 11:30pm, followed by a two-hour break in the middle of the day, and a 1:30-5:00pm shift, equaling a total of 8.5 hours per workday. Others reported shifts beginning as early as 5:30am and ending as late as 6:30pm.

In practice, many interviewed workers reported that they did not receive any additional pay for overtime work. As one worker said, “They don’t pay extra-time, although they register them [overtime premiums] on our paper.”

Workers interviewed also stated that they felt they did not receive adequate breaks. Workers expressed pressure to “work at all times.” One worker described his daily experience as being under “constant surveillance.” One worker who wished to rest on a Saturday and Sunday due to illness was threatened that he would be marked as absent for the rest of the week should he take two rest days. Workers consistently reported being unable to take rests or breaks. Some had to travel to work in other areas relatively removed from where their initial assignment was without transportation back to their homes or original worksite. Workers complied with these demands out of fear of losing their jobs or having their pay reduced.

“There is no time for rest. You can only rest at lunchtime. If you finish the work assigned to you, you have to help out with other jobs. We will sleep anywhere. If the machine stops working in a certain place, that’s where we will sleep.”

—Male, Age 19, Mandimba District

Some workers were expected to work Saturdays as a standard workday and most reported they were expected to work Sundays. Work on Sundays could hypothetically qualify workers to receive overtime

rates (at up to double their normal daily wage), but failure to accept Sunday work could reportedly result in termination. Due to regular requirements for Saturday and Sunday work, many workers worked multiple seven-day weeks per month.

Only one worker reported having observed a visit from a labor inspector. That worker had been employed in construction of the N13 Project for over two years, during which time he reported a visit once from a labor inspector. During the inspector's visit, the inspector reportedly informed workers that they did not need to work on Saturdays and that "if they want to go home, they should go".

Health and Safety

Road construction workers faced a range of hazards including the risk of falling objects; handling of hazardous materials such as mercury,²⁸³ tar, and cement; and exposure to MC-30 (a chemical used in asphalt application that exposes workers to hazardous vapors and skin damage). At least one interviewee had knowledge of multiple cases of injuries involving lost fingers or limbs. Workers interviewed largely lacked access to potable water while working on remote sections of road, which contributed to dehydration in extreme cases.

Provision of personal protective equipment was inconsistent, with some workers receiving some equipment and others not receiving any. Researchers were unable to discern a theme in provision of equipment; in some cases, workers exposed to some of the most hazardous tasks were the workers with the least amount of protective equipment.

Workers interviewed also expressed concern that they would not be compensated for health care costs in the case of work-related illness or injury. Individual employees were reportedly responsible for all costs associated with transport and care in a medical facility. Further, workers reported the fear that their employment would be terminated if they missed more than two to three days of work. The burden of sickness or injury on the job in some cases caused indebtedness that was further compounded by deductions in pay for time spent in the hospital or out of work.

In addition to inadequacy of wages, most of the workers interviewed cited lack of food, water, and lack of transportation and rest as creating the most discomfort in their jobs. More than 30 percent of conversations mentioned hunger and lack of access to water as significant issues during the day.

Living Conditions

All workers are responsible for providing their own food and water while on the job. Since they are reliant on boreholes to obtain water, this could be problematic if working some distance from work sites. Drivers were the exception to this, receiving food and water within the road yards. A deduction of 600 MZN per month was taken from drivers for this.

Inadequate access to food and water were compounded by lack of transportation provided by employers. Because of the long days and long distances many workers had to travel to get to work sites, carrying sufficient food for the day was especially challenging. The distances that workers had to travel from home to work were significant, with the closest distance being 3 kilometers and the longest distance being 25 kilometers. The average distance ranged between 5 to 7 kilometers, with workers reporting that it generally took between 1 to 2 hours to walk each way. It is important to note that these distances were only to get to the work yard and did not include distances to the respective work sites. While transport was then provided to workers from the road yard to the work site in the morning, it was not provided on the return when shifts concluded nor was it provided for lunch breaks. Round-trip walking distances to access food and water could add another 3-5 kilometers, leaving only 20 minutes for rest and eating at the mid-day break. It was estimated that, on average, a single worker might walk a total of between 25 to 30 kilometers in the course of a day, in addition to work responsibilities. To cut down on the amount of walking, some workers hitched precarious rides on front loaders or “tipper” trucks.

Workers expressed pressure to return home at the end of the day regardless of when they finished up work and a fear of having to sleep in villages where they may not be known and could be seen as “suspicious.” A few workers described simply lying down to sleep at work site at the conclusion of a shift. When one worker approached a supervisor with a few colleagues to ask about why they were not provided with transportation as promised during recruitment, they were told “Whoever doesn’t want to work can leave, we don’t want to hear nothing about transport.”



Some workers reported that only Chinese supervisors were allowed to sleep on-site in the road yard compound. Some workers also reported that workers were not allowed to use the bathroom facilities at the road yard located inside the compound where supervisors lived, and were not provided with any alternative sanitation facilities, which they found degrading.

Abuse, Harassment, and Threat of Dismissal

Workers interviewed stated that, due to the language barrier between Mozambican workers and Chinese supervisors, misunderstandings often arose. Supervisors reportedly frequently used verbal insults against workers.

Over half of interviewees had witnessed or experienced physical violence perpetrated by Mozambican and Chinese supervisors. Workers stated that physical violence could be a reaction to a number of worker behaviors including resting, asking for rest, not following instructions, or not understanding instructions because of a language barrier. Workers reported fear that in addition to verbal or physical abuse, they could be terminated for these basic issues, or as retaliation for expressing grievances to supervisors or law enforcement.

“Life in the community is very hard. We are really struggling, suffering- no money or jobs...”
— Job Applicant, Mandimba District (Male, Age 26)

When local police were called to question, workers were either unwilling to express complaints to the police for fear of losing their jobs or noted their skepticism that police would intervene to protect workers. In the few cases where police did pursue cases, workers interviewed stated that supervisors were dismissive of their involvement. One worker observed his Chinese supervisor “laughing” when police arrived and telling them to “call the ambassador.

Forced Labor Indicator	Type of Worker Impacted
Abuse of workers’ vulnerability through the denial of rights or privileges, threats of dismissal or deportation	General and skilled laborers

Gendered Dimensions of Work

Although the majority of road workers were men, women were also present. According to workers interviewed, most women employed on the road project served as either flag holders or domestic workers as cooks and cleaners within the yards where Chinese supervisors and employees lived. Several workers interviewed reported that they believed some female workers present may have misrepresented their age in the hiring process and may be 16-18 years old. (Workers reported scenarios in which young women between the ages of 16 and 18 would state their ages as over 20 in order to secure jobs.) These claims could not be verified, however. One interviewee reported being aware of a case of sexual harassment.

HIV/AIDS Testing

Mandatory HIV testing as a condition of hiring was reported by workers interviewed. This is prohibited under Mozambican law, as is discrimination on the basis of HIV status.²⁸⁴ A civil society representative interviewed by Verité researchers also reported that a woman working on the N13 Project had been fired when she tested positive for HIV. This woman reportedly took her case through the court system and was reinstated into the position she was hired for.

Labor Inspections

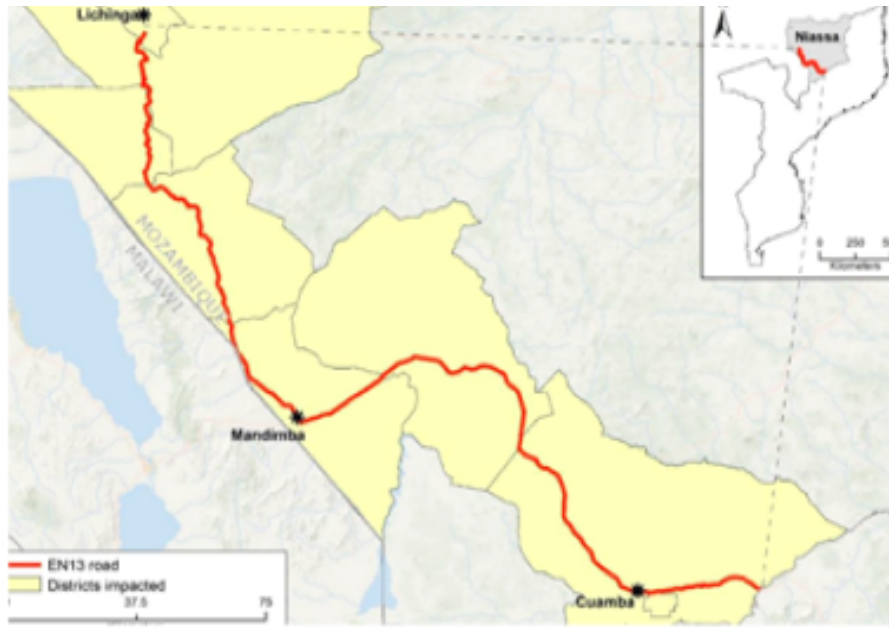
Many workers and community members expressed concern about the ability of government to protect workers from exploitation. Twenty percent of interviewees made comments concerning lack of visits from inspectors or other weak inspections or follow ups. Some also reported impressions that inspectors may have received payments during visits. One worker reported, “the Inspector came, took an envelope and left.” Another observed, “Not sure what the regulations are, but it seemed suspicious that the Labor Department had only visited the camp once when the yards were set up.” Another commented that “the Labor Inspectors are paid off by the Chinese, so they do not help the workers who come to them to complain.” The impact for workers was the sense that mechanisms established to protect them were circumvented by their own institutions. In some cases, police and community leaders were also seen as neglecting to protect workers and residents or as colluding outright with private sector interests. Complaints against the company were reported to have disappeared at various stages of grievance processes. One worker observed he could not be sure of their community leaders acting on his behalf: “It is possible that the community leader knows that there will be no local jobs, even though he promises there will be.”

Social and Environmental Consequences of the N13 Project in Niassa

Deforestation and Environmental Degradation Associated with Road Development

The N13 road passes through settled communities, and its construction has affected structures and other community areas such as houses, chicken coops, maize storage buildings, agricultural fields, and planted trees.

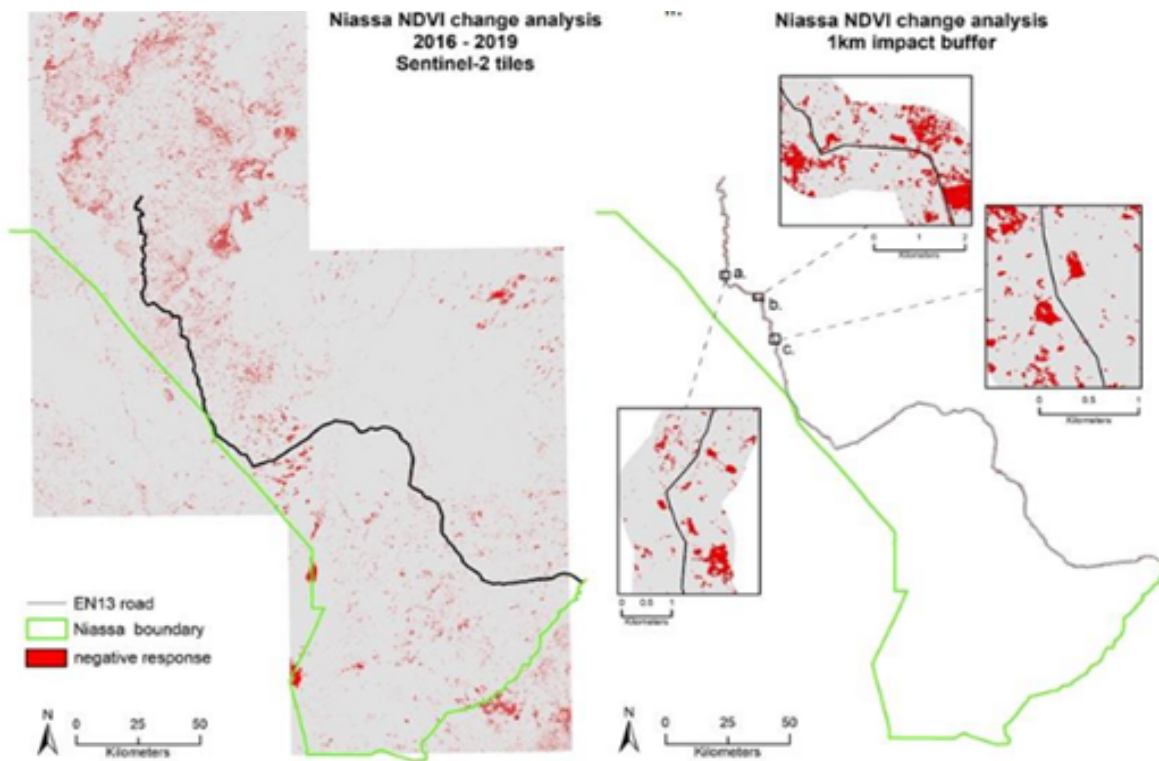
FIGURE 14. AFFECTED COMMUNITIES OF THE CUAMBA–MANDIMBA–LICHINGA N13 ROAD PROJECT



Source: University of Nottingham, Rights Lab²⁸⁵

In terms of effects of road construction on forest cover, an analysis of geospatial data found significant negative response in ‘greenness’ for areas connecting Lichinga to Mandimba in all of the buffer zone distances adjacent to the road; that is, the loss of tree cover was apparent.

FIGURE 15. NORMALIZED DIFFERENCE VEGETATION INDEX (NDVI) CHANGE ANALYSIS ALONG SELECT N13 ROAD SEGMENTS 2016-2019



Source: University of Nottingham, Rights Lab²⁸⁶

This was corroborated by community informants in areas along the road, who reported that when acacia trees were cut to make space for the road, areas became “like deserts,” and surrounding areas experienced increased winds – leading some households to lose their roofs – and soil erosion. There was also a perception expressed that the loss of pine trees had contributed to warming temperatures on a local level. A civil society informant noted that local community members did not have access to the project’s Environmental Impact Statement. A preparatory report by JICA appears to imply that an assessment of the area determined that it was not forested and that “the use of ‘deforestation’ as a word to refer to vegetation clearance as part of the project impact is considered misleading.”²⁸⁷ Community members had not witnessed adequate attempts to plant seedlings to reforest the area.

During field research, several interviewees noted that the growth of the road might further facilitate the expansion of natural resource extraction such as logging, illegal mining, and wildlife poaching in surrounding areas. Geospatial analysis did indicate rapid development in the evaluated areas of Niassa along the N13 road construction corridor, including mining activity and informal settlements, suggesting a potential change in the livelihood resources and patterns of local populations.

As discussed in the University of Nottingham Rights Lab report (see Annex 3), follow-on research using satellite intelligence could more directly link the nexus between deforestation and labor and livelihood outcomes in project affected communities by:

- Increasing land cover and land cover change assessment to focus specifically on tree loss.
- Investing in very high spatial resolution imagery (sub-meter) to explore the development of small-scale settlements and roadside activity.
- Exploring image textural analysis methods for identifying man-made objects and land cover change (i.e., impervious surfaces such as roads and bridges) in the ‘natural’ landscape.
- Investigating spectral indices relating to geological features to identify and track the development of mining, forest plantations, and other resource related activities.
- Determining biomass and forest loss, and other environmental indicators linked to climate change impacts.

It is unclear to what extent these levels of environmental degradation will push communities and individuals further into vulnerabilities to increased poverty. For example, a next phase of research should inquire as to whether crops were harvested before construction work began, determine loss of assets and livelihoods, especially those reliant on ecosystem services that provide adequate water and soil quality, and to what extent de jure and de facto land tenure and property rights were affected by road construction.

Community Displacement Associated with Road Project

The ANE prepared a Resettlement Action Plan (RAP) intended to minimize impact on these households. However, interviews with community members revealed that many citizens had not been previously aware that road development might necessitate resettlement. At the same

time, project appraisal documents including the RAP demonstrate a record of some community consultations, possibly pointing to an ineffective or inadequate consultative process.

A guiding principle of the RAP is fair compensation for land acquisition, relocation, and impact on livelihood for the 552 affected persons identified.

Researchers were able to ascertain that some households affected by the project did secure some level of compensation, while others were not compensated at all. A key issue is a gap in Mozambican law specifying what would qualify as “just” compensation for parties impacted by public works projects such as road development.

The loss of property, livelihood, and food security created by this project can contribute to worker vulnerability to labor abuses. As noted in the “Entry into Sector” section, one worker displaced by the project was explicitly offered employment on road crews as compensation for the detriment to his livelihood, and many others discussed the pressure to seek employment in road construction due to loss of alternative livelihood.

In spite of these negative impacts, some community members interviewed perceived the road development as an overall positive factor for the area, noting improved transportation and economic development opportunities such as improved access to market for agricultural products.

Contravention of Donor Safeguard Policies

Both of the international donors – AfDB and JICA – have safeguard policies²⁸⁸ that are intended to mitigate potential social and environmental harm linked to funded projects. These policies mandate a comprehensive financial package for displaced people and plans for resettlement compensation, along with an obligation to bring in environmental and social impact specialists where host institutions lack capacity.²⁸⁹

Many donor safeguard policies relating to labor and social protection were contravened in the course of the N13 Project. Examples of safeguard procedures not observed, as identified by case study field research, include provisions around contracts, working conditions, grievance mechanisms, compensation for affected community members, participatory community consultation procedures, and monitoring protocols.

Examples of safeguard procedures not implemented as reported by community members and workers interviewed by Verité researchers include:

- Provision of contracts that include accurate information on conditions of work (such as hours, wages, rest periods, and leave entitlements) to employees of contractor;
- Working conditions for all workers engaged that comply with, at a minimum, all relevant national laws including minimum wage laws and health and safety legislation;

- A transparent and robust grievance mechanism available to all workers;
- Provision of a working environment that does not pose risks to physical health and safety;
- Participatory consultation to gather feedback from impacted communities and adjustment of project plans based on that impact;
- Easy access to resettlement action plans for affected communities;
- Sufficient compensation and support for any community member who is relocated or experiences a loss of property/livelihood due to project activities; and
- Monitoring by donors for unforeseen negative impacts on local communities, and remediation interventions as necessary.

Underpinning the contravention of donor safeguards were gaps in the systems for contractor screening and monitoring and enforcement of labor laws, often due to a lack of capacity. Beyond inadequate monitoring and enforcement, workers interviewed reported that they perceived some local law enforcement to be corrupt and therefore unable or unwilling to assist workers. This left workers without any recourse when they experienced poor or coercive working conditions.

Contravention of safeguard standards related to the compensation and resettlement of affected populations appeared to be tied, in part, to gaps in land management frameworks in Mozambique. Experts have judged Mozambique to have a strong *de jure* legal framework around land usage, with laws that aim to protect the rights of local communities while still encouraging commercial investment to bolster the overall economy. (The 1997 Land Law is the primary legal instrument regulating land usage.²⁹⁰) In practice however, full implementation of these legal policies, particularly requirements for community engagement and protection, is judged to be low; reflecting “tensions between a government keen on promoting foreign investment and agro-industry and a rural population that is insufficiently aware of and not always able to exercise their legal rights.”²⁹¹ As a result, land acquisition in rural areas for investment purposes has displaced local populations, contributed to deforestation, and negatively impacted local livelihoods.

Typical donor safeguard processes for assessing and mitigating land use/property impacts rely at least in part on a review of land titles for the area, which may not accurately reflect actual patterns of community land ownership and usage. Even where registered land claims do exist, systems for recording property and ownership are weak. This was further complicated by the fact that much of land usage in Niassa Province and rural Mozambique is seasonal. Land that appears to be unused when plans and impact assessments are conducted may in fact be heavily used at other times of year or in other years (due to crop rotation). Without fully participatory community input sessions, these realities of land usage were likely to be obscured. Another compounding factor reported by community members and civil society to Verité researchers was that the findings from impact assessments were not made fully available or accessible. For a full discussion of the role of land tenure and property rights as they relate to this case study, see Annex 2.

Niassa Conclusions and Recommendations

Conclusions

The need for infrastructure in developing regions and its positive effect on poverty reduction has been widely accepted across development sectors. Roads enable access to public services and institutions, provide opportunities for connection, and simplifying transport. In the past, studies have focused on highlighting these positive effects of road access on poverty alleviation and livelihoods by reducing travel time and costs, as well as creating job opportunities and establishing better access to local markets. However, road construction and access can also increase vulnerability.

Verité's field research found evidence of a range of labor abuses and contraventions of social protection standards associated with construction of the Cuamba–Mandimba–Lichinga section of the N13 road. Environmental degradation due to road construction has increased economic insecurity and decreased avenues for livelihood in some local populations. This has acted in some cases as a “push” factor to accept exploitative working conditions in road construction. There was limited evidence of indicators of forced labor in N13 road construction, in the form of deception about the nature and conditions of work (primarily wage levels, hours and job tasks); work for very low wages; and abuse and harassment.

Recommendations

In light of the findings detailed in the Niassa case study, this section presents recommended actions for the Government of Mozambique, private sector construction contractors, international finance institutions (IFIs), and civil society. Recommendations are linked to risk issues and vulnerabilities identified through the field research.

Recommendations for the Government of Mozambique



Verité recognizes the commitment that the Government of Mozambique has made to building the capacity of labor inspectors and law enforcement to recognize and identify TIP. Verité field research indicates that further resources are required in order to fully deter and detect serious labor abuses. Sanctions for labor violations in road construction were reportedly infrequent. Corruption may be significantly affecting the functioning of the labor inspectorate in some cases, according to workers and community members interviewed.²⁹² Therefore, Verité recommends further measures to improve the capacity of the labor inspectorate, including:

- Providing additional capacity building to labor inspectors on how to understand and identify key elements of trafficking in persons risk and other serious labor abuse

and how they may manifest in key sectors and settings;

- Ensuring that labor inspectors receive adequate compensation;
- Paying for labor inspectors' travel expenses;
- Providing incentives to carry out inspections in remote locations;
- Hiring additional inspectors to ensure that the number of active labor inspectorate staff engaged in inspections is adequate for the number of inhabitants;
- Including female labor inspectors in labor inspections to ensure that female employees are more comfortable in reporting issues of sexual harassment and abuse;
- Issuing sanctions against employers who fail to grant inspectors full, unimpeded access to all areas of worksites.

In addition, the Government of Mozambique should:

- Ensure processes that enable affected communities to directly participate in project planning, including impact mitigation planning. Notes from public meetings as well as project planning documents should be made available in Portuguese and local languages and disseminated through accessible communications and media.
- Increase the capacity of the ANE to conduct due diligence in the selection of road construction contractors that includes clear and measurable criteria for observance of the ILO's fundamental labor standards and Mozambican labor law; to conduct regular monitoring of contractor adherence to Mozambican law and donor safeguards; and to develop and enforce remediation corrective action plans where misconduct is detected.

- Where there is evidence that local law enforcement is impacted by corruption, work to ensure that workers have alternative avenues for recourse. This may include additional monitoring from labor inspectors from outside the region or the engagement of third-party monitors. It could also include the development of an independent grievance mechanism.
- Continue to support issuance of DUATs (*Direito do Uso e Aproveitamento de Terra* – the long-term right to use and benefit from a piece of land) and other forms of recognition of communal land rights²⁹³ – and uphold their protection for local populations – as a means to reduce displacement of communities. Work to develop an approach for a more transparent and centralized listing of land claims.

Recommendations for International Finance Institutions



Weaknesses in labor and environment-related safeguards associated with lending by international financial institutions have long been a subject of scrutiny and concern among civil society and affected communities.²⁹⁴ In order to better protect against harm to humans and environment associated with international financial institution lending, calls from civil society organizations should be heeded to bolster the depth of IFI social safeguard frameworks, as well as associated accountability mechanisms. IFIs should:

- Build out current labor safeguards to encompass benchmarks that specifically address the ILO's forced labor indicators and other known risk factors for forced labor.²⁹⁵
- Develop and make transparent a system for screening and tracking the past social

performance of contractors and project implementers. IFIs can withhold funding when a proposed contractor has a past history of violating labor rights or other social safeguard elements.

- Ensure robust consultations with affected communities and civil society prior to project implementation and ensure that relevant planning and review documents are easily publicly accessible, in local languages.²⁹⁶
- Commit to supporting independent grievance mechanisms as required by social safeguard frameworks and explore developing these mechanisms in collaboration with host governments.
- Require third-party monitoring to ensure compliance with lending safeguards.



Recommendations for Contractors

Contractors should put in place an effective and transparent system for preventing the risk of trafficking in persons in their operations and those of their contractors, based on robust management practices and including:

A process to identify, evaluate and prioritize trafficking in persons risk in its operations and to understand and implement applicable legal and customer requirements for the prevention of trafficking in persons to its operations and those of its supply chain.

- Incorporation of operational controls into business processes to minimize the

identified risks of trafficking in persons and to comply with legal and customer requirements.

- Clear and transparency communication about organization's antihuman trafficking policies, practices, expectations and performance, and legal requirements to workers, subcontractors, clients, and external stakeholders.
- Regular due-diligence monitoring of the risk of trafficking in persons among the workforce and workforce of any subcontractors.
- A confidential grievance mechanism made available for workers in their native language(s) that ensures workers can raise grievances anonymously, without intimidation or retaliation.
- Procedures to address worker grievances in a timely manner and report the resolution back to the workers.
- Regular self-assessment to evaluate conformance with internal policies and procedures and customer requirements and to verify compliance with legal requirements.

Guidance and implementation criteria for these and other management practices to ensure against the risk of trafficking in persons are available in Verité's [Responsible Sourcing Tool](#) and Verité's [Fair Hiring Toolkit](#).

Annexes

Annex 1: Legal Framework and Enforcement Mechanisms

Ratification of International Conventions and Protocols

Instrument	Status
Protocol to Prevent, Suppress and Punish Trafficking in Persons, Especially Women and Children, supplementing the United Nations Convention against Transnational Organized Crime (Palermo Protocol)	Signatory ²⁹⁷
United Nations Convention on the Rights of the Child (CRC)	Signatory ²⁹⁸

ILO Core Conventions	Ratification Status ²⁹⁹
Convention 87 - Freedom of Association and Right to Organize	Ratified
Convention 29 – Forced Labor	Ratified
Convention 182 – Worst Forms of Child Labor	Ratified
Convention 138 – Minimum Age	Ratified
Convention 98 - Right to Organize and Collective Bargaining	Ratified
Convention 100 - Equal Remuneration	Ratified
Convention 105 - Abolition of Forced Labor	Ratified
Convention 111 - Discrimination (Employment and Occupation)	Ratified

For the case studies in Tete and Niassa, the most relevant to protection of workers in the forest sector relates to protections against trafficking in persons , including trafficking for the purposes of forced labor, child labor, discrimination, health and safety, and freedom of association. The key legislative instrument on labor rights is the Mozambican Labor Law (Law No. 23/2007) concerns the rights and duties of workers, as well as matters related to hygiene, health, and safety at work (including requirements of ILO conventions).

National Law

Topic	Key Legal Standards
Child Labor	The minimum age for employment in Mozambique is 15. Eighteen is the minimum age for hazardous work or work performed at night. Children ages 12-15 can work with authorization of a child's guardian/legal representative. ³⁰⁰
Discrimination	Discrimination is legally prohibited and according to the U.S. Department of State, this is largely enforced. However, the U.S. Department of State notes some harassment of foreign workers by government labor inspectors who reported being required to pay bribes or risk denunciation to authorities. In 2017, a Constitutional Council ruled that foreign workers could not be deported without judicial review. ³⁰¹
Forced Labor and Trafficking in Persons	According to the U.S. Department of State, all forms of forced labor are banned under national law. The sanction for trafficking convictions is imprisonment for 16-20 years. ³⁰²
Freedom of Association	In Mozambique, the Labor Code (Articles 137-163 of the Labor Law of 2007 and Article 86 of the Mozambican Constitution) guarantee freedom of association and allow workers and employers to join and form trade unions. In general, forestry company workers in Mozambique may be registered with the National Union of Workers in the Construction Industry, Madeira, and Mines of Mozambique (SINTICIM). Registration of workers is voluntary.
Health and Safety	Health and safety standards are set by the government. These standards include the right to protective equipment, first aid, and compensation for injuries on the job. Health and safety standards do not apply to the estimated 95 percent of individuals in the informal economy. ³⁰³
Hours	<p>The Labor Law of Mozambique provides that normal working hours cannot exceed eight hours per day, 48 hours per week, with a limit of 6 days worked per week. The maximum number of hours that an employee may work per day may be increased to nine hours if the employer grants him or her an additional half day's rest per week.</p> <p>Overtime is defined as work performed beyond the normal daily working period and the employee qualifies for an extra 50 percent of their daily rate. However, a distinction is made between overtime rendered during a working day (extra hours) and overtime rendered during mandatory or complementary rest periods or during holidays (exceptional hours). The main difference is that while extra hours are limited to a certain number per week, trimester and year, and must be compensated by payment of an additional 50 percent per hour up to 8:00pm and an additional 100 percent after 8:00pm, exceptional hours must be compensated by payment of both an additional 100 percent per hour and a day's rest within the following three days.³⁰⁴</p> <p>Under the Labor Law, employees are entitled to a break of between 30 minutes and two hours per working day, assuming an eight-hour day.³⁰⁵</p>
Wages	Minimum wage is industry specific in Mozambique with differing minimum wage rates for sectors including, agriculture and forestry, mining, manufacturing, and construction. ³⁰⁶ The monthly minimum wage for agriculture, livestock, and forestry in 2019 was 4,390 MZN (66.51 USD); and for the building industry, 6,135 MZN (92.95 USD). ³⁰⁷

Annex 2: Land Tenure and Property Rights Analysis of the Niassa N13 Project

Mozambique has made significant progress in the past twenty years to improve access to land and security of land rights for all citizens. Particular focus has been made to strengthen its land policy, legal frameworks, and land administration and management systems. In fact, the country is widely regarded as having one of the most progressive land policy and legislative frame works for sustainable and equitable land governance in Africa. Much of the focus in Mozambique has been on large -scale land acquisition in rural areas by foreign investors related to agriculture. In these cases, local livelihoods have been impacted due to displacement and inability to access land and natural resources. Rising tensions between communities and the Government and investors have created conflicts. Security of land rights and tenure are viewed as the best way to mitigate these conflicts.³⁰⁸

Despite statutory recognition of individuals to use and benefit from land they occupy through DUATs³⁰⁹ (*Direitos do Uso e Aproveitamento de Terra*), which are the closest to what is known elsewhere as land titles,³¹⁰ realization of these rights often fails to manifest due to lack of awareness of rights, lack of local and community capacity to enforce their rights, and weaknesses in land administration.³¹¹

The Niassa case study hints that even well-intentioned efforts to improve access to communities and community land rights may be affected by large-scale development or infrastructure projects. For example, the Resettlement Action Plan (RAP) for upgrading the N13 Road recognized that road improvements would necessitate demolition of houses, kitchens, tobacco barns, maize stores, water wells, small shops, and crop losses of beans, tobacco, millet and peas with 334 households requiring resettlement.³¹² The RAP recommended minimizing the impacts of land-takings and relocation to include:

- Relocating or repositioning of removed structures and people within the existing surrounding areas, to minimize resettlement in new, remote, and distant areas;
- Adequately compensating all the affected persons, to ensure that their means of livelihoods are maintained or improved;
- Paying compensation in time and before the affected persons' property is removed, to minimize transitional loss of income, loss of access to services and livelihood by the affected persons;
- Ensuring that the affected persons' grievances are accommodated and fully addressed as quickly as possible;
- Providing adequate security, to avoid looting of property.
- Providing employment to Project Affected Persons (PAP's) as an alternative source of income, during project implementation.³¹³

Field research did not yield primary data on the extent to which these recommendations were employed, but a few findings are notable. First, individuals who either chose not to, or were

unaware of resettlement and reimbursement programs, simply had their property destroyed without compensation. Second, a few interviewees implied that compensation programs neglected businesses affected by the rehabilitation. Another described outright corruption as one shop owner described being expelled from his land after being shown DUATs with another's name on it. Follow up interviews revealed that DUATs were issued in the same three names repeatedly as "landowners," implying corruption in the issuing of DUAT compensation.

Regarding grievance mechanisms, Mozambican law³¹⁴ is "silent" on issues such as eligibility for compensation; amount of compensation; creation of a grievance mechanism related to any issues of resettlement or compensation, and security of tenure.^{315 316 317} Grievance mechanisms are recommended in the RAP and in JICA and AfDB safeguards, but Verité's research indicated that community leaders served as the de facto grievance mechanism as opposed to a formalized grievance system. Finally, the RAP called for local employment provision as an alternative source of income for those affected by the N13 upgrade. The case study indicates hiring practices disadvantaged local job seekers. A 2017 study on the impacts of the N13 project supports and augments this finding. According to respondents in that study, employment was one of the most contentious issues along the entirety of the road system and a common topic of complaint lodged with local officials. Further, there was a strong perception, described within the majority of focus groups in that study, that construction contractors preferred to hire workers from neighboring countries or other parts of Mozambique.³¹⁸

In general, Verité's field research found inconsistency in approaches to land rights and resettlement associated with N13. The processes ranged from full to zero compensation for property damage to livelihood resources including market stall, fields, corrals, and fruit trees; to homes demolished outright without compensation. Assets such as these represent significant investments in labor and resources within these communities and provide a vital source of cash and livelihood. Although these may be rebuilt, the spatial re-alignment of the new connections, as well as new restrictions against building too close to the road will have a negative effect on affected small business owners and small holder farmers. Verité recommends further study to determine how many individuals directly affected by resettlement either acquired, or sought to acquire, jobs on the N13 project and their specific labor conditions and livelihood outcomes. This would draw an even more precise connection between incidence of and vulnerability to labor exploitation and trafficking in persons vulnerability related to degradation of livelihoods.

Research from the World Bank into resettlement globally has found that people who are resettled fare worse than in their previous locations. Under their Impoverishment Risks and (livelihood) Reconstruction (IRR) model, the key risks of resettlement were identified as landlessness, joblessness, homelessness, marginalization, food insecurity, loss of access to common property resources, increased morbidity and mortality (i.e., declining health), and community fragmentation.³¹⁹

Based on the intersections between labor vulnerability and land tenure indicated by this research,

Verité believes the following global efforts to ensure land tenure security to communities affected by large scale infrastructure projects are important also for the protection against vulnerability to labor exploitation:

- The right to replacement land that is of better or at least equal quality as the land from which affected people are being displaced.
- The right to compensation for all lost assets through cash or replacement assets. Compensation, when appropriate, is based on the principle of replacement cost. Preference should be given to land-based resettlement strategies for displaced persons whose livelihoods are land-based.
- The right of affected populations to re-establish or improve their standard of living after resettlement. Government authorities should be tasked not only with land registration matters, but also to assist with selection of appropriate agricultural land to verify that it is suitable for crop production. At minimum, the new land should be the same quality as affected population's previous land and they should be able to realize their rights to food and water, including the ability to grow or buy food appropriate to their traditions.
- The rights and practices enshrined in *Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests*,³²⁰ a global protocol intended to contribute to achieving sustainable livelihoods, social stability, housing security, rural development, environmental protection, and sustainable social and economic development. The Guidelines serve as a reference and set out principles and internationally accepted standards for practices for the responsible governance of tenure.

Annex 3: Geospatial Analyses of Changing Land Cover at Locations of Interest in Mozambique



Geospatial Analyses of Changing Land Cover at Locations of Interest in Mozambique

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6. Discussion and Conclusion

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Appendix A.

Appendix B.

Appendix C.

1. Introduction

Satellites have been orbiting, and measuring, the Earth since the 1950's, creating an archive of data documenting the dynamic processes, both natural and human-made, which impact the Earth's surface. This rich history of archival data, combined with advances in satellite sensor technology has increasingly been recognised as a powerful tool to support work in the field of human rights (Foody et al, 2019; Boyd et al., 2018; McGoogan and Rashid, 2016). Satellite data can support human rights research by providing a new view into often inaccessible areas of world (reasons of security, politics or remoteness) where known acts of abuse or human rights violations have occurred (Drejer and Bales, 2018; Landman, 2018; Jackson et al., 2018; Drake and Ashcroft, 2013; Bales, 2007).

Recently, satellite data has been used to explore the nexus between modern slavery and environmental degradation (Bales et al., 2016; Brown et al., 2019). In the past, development in satellite-based processing and analysis has evolved around natural Earth science disciplines. As a result, there is a wealth of knowledge and skill in satellite-based analyses addressing environmental, and land cover, change. This research aims to transfer this experience to explore the relationship between modern slavery and environmental degradation.

The work presented here is part of a collaboration between Verité and the University of Nottingham's Rights Lab Data and Measurement Programme in exploring the links between modern slavery and environmental degradation associated with deforestation in Mozambique. The report supports Verité's qualitative research (including key informant interviews, focus group discussion, and analysis of written documents) into labour abuses associated with activities of environmental degradation with an additional layer of information derived from satellite-based geospatial analysis. The use of satellite data can position activities of deforestation and environmental degradation in space and time, creating datasets (maps) that can help us to further understand the relationship between modern slavery and environmental degradation, and predict future at-risk areas.

Following Verité's research design, this work focuses on two case studies, logging in Tete and infrastructure provision in Niassa (Figure 1). Verité's research revealed exploitative labour conditions and examples of abuse in the province of Tete related to the illegal cutting of Nakula wood, a high value rosewood species. Large areas of forest have been clear-cut using environmentally destructive methods, leaving a significant impact upon the landscape and the livelihoods of the local population. For the Niassa case study, the impact of road construction (EN13) has facilitated deforestation and environmental degradation as a result of an increasing population and the subsequent pressure to develop transport infrastructure. Additionally, improved access to remote areas that are rich in natural resources (forest, minerals, and productive land) is thought to encourage activities associated with regressive labour conditions. Loss of local livelihoods (for example from forest resources or small-scale agriculture) may push vulnerable people into exploitative employment.

Verité's research in Mozambique has revealed a story of environmental and forest degradation, as well as regressive labour conditions related to infrastructure and forest activities, this report's role is to support these findings with state-of-the-art satellite and geospatial data and modelling to map the impacts of timber extraction and road construction on the natural environments of Tete and Niassa. For both case studies, a general contextual analysis of forest cover (loss and gain) was conducted. Further analysis was tailored to each case study in view of demonstrating a variety of datasets, and opportunities to utilise satellite and geospatial based analysis within human rights research.

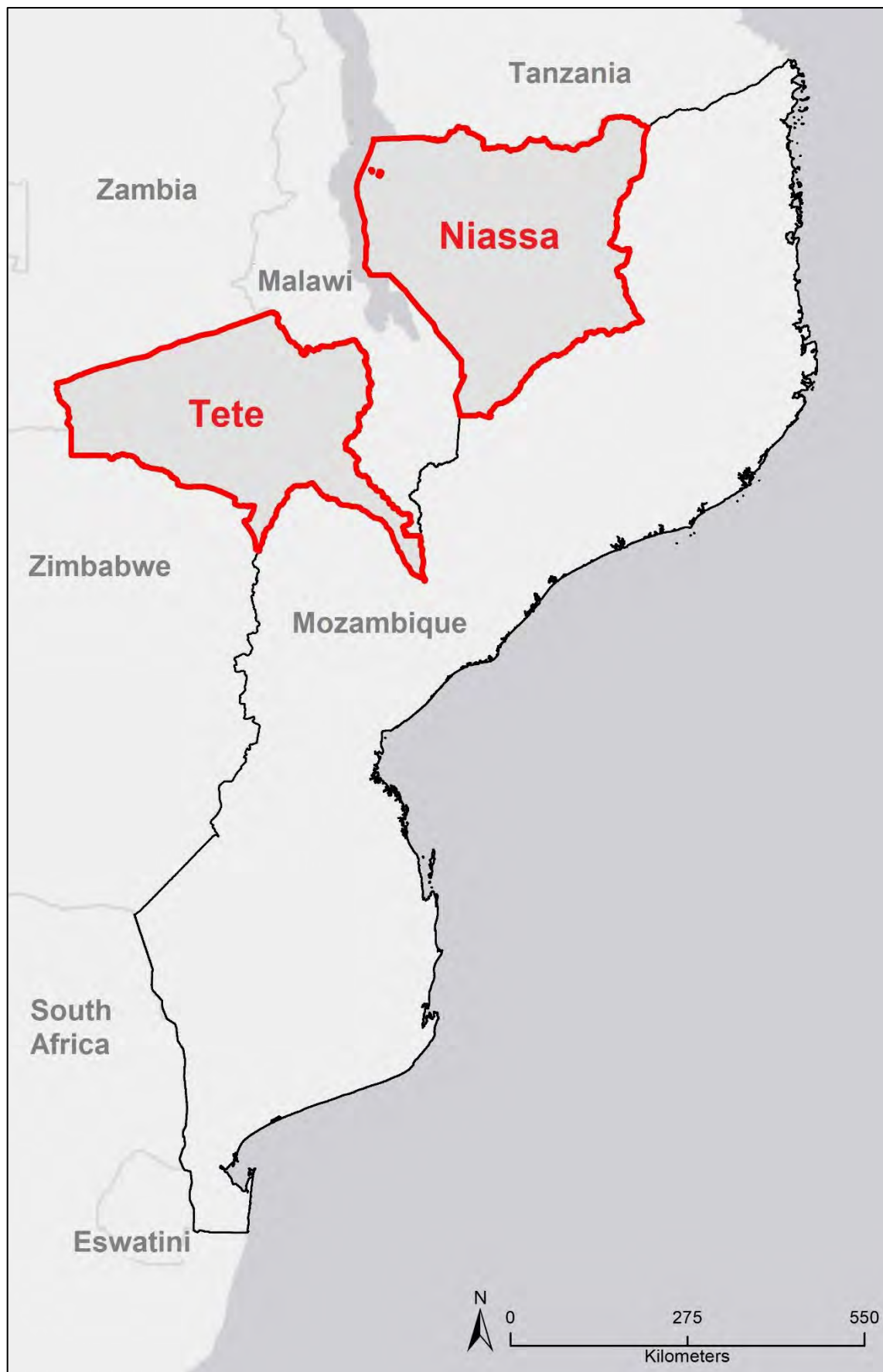


Figure 1. Location of case studies, Tete and Niassa provinces in Mozambique.

2. Satellite data characteristics

Satellites capture and record different kinds of image data based on the specification of the platform and the sensor on-board. This can impact the imagery produced, for example, the resolution (how clear the images are), the type of information recorded, and how frequently the data can be updated. Satellite data can be categorised under four different types of resolution: spatial, spectral, temporal and radiometric.

Spatial resolution:

Spatial resolution is simply a measure of the smallest object that can be resolved by the satellite sensor or as the linear dimension on the ground represented by each image pixel (i.e. pixel size). Extraction of details from satellite imagery is highly dependent on the spatial resolution. There are four categories of spatial resolution: low resolution (> 30 m), medium resolution ($5 - 20$ m), high resolution ($1 - 5$ m), and very high resolution (< 1 m).

Spectral resolution:

Spectral resolution describes the ability of the satellite sensor to record information on a particular spectral range. The spectral resolution of a sensor is determined by the number and width of spectral bands. For example, a satellite sensor can record data in a single panchromatic band (a wide band based in the visible spectrum), however most satellite sensors record in multiple spectral bands: the visible (blue, green, red), near-infrared and thermal portions of the spectrum. It is important to consider spectral resolution when selecting satellite data as different objects on the Earth's surface have different spectral signatures.

Temporal resolution:

Temporal resolution refers to the repeat cycle or frequency with which a satellite sensor revisits the same part of the Earth's surface. Temporal resolution can be categorised as: low resolution (> 16 days), medium resolution ($4 - 16$ days) and high resolution (< 24 hours – 3 days). Satellite images collected over a given interval are called multi-temporal datasets, this is a key advantage of satellite sensors with a high temporal resolution.

Radiometric resolution:

Radiometric resolution is the ability of the satellite sensor to record in different levels of energy, ultimately impacting image depth, contrast and brightness. A sensors' radiometric resolution is determined by the number of 'bits' into which the recorded radiation is divided. For example, in an 8-bit dataset the digital number can range from 0 – 255 for each image pixel ($8 = 256$ total possible numbers), more 'bits' result in higher radiometric accuracy.

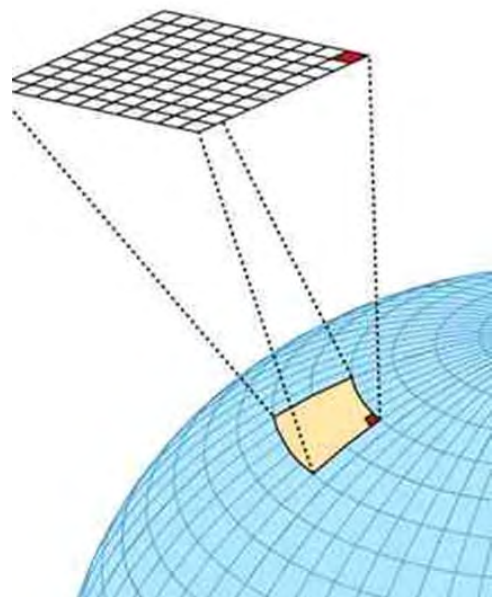


Figure 2. Visual representation of satellite data tile.

3. Data

A variety of geospatial data was processed or sourced for this research, including satellite data and models of forest cover trends. Additional data layers (for example land cover and biomass) are included in Appendix A. to provide context and further information to supplement the data analysis in this research.

3.1 Satellite data:

Satellite data was processed from multiple satellite sensors covering a wide variety of spatial and temporal resolutions for environmental degradation analysis. The research utilises freely available optical satellite data from the longstanding Landsat archive (OLI sensor records in 30 m visible and near-infrared bands) and the Sentinel-2 series (MSI sensor records in 10 m visible and near-infrared bands) to map at landscape scales, and commercial optical data from Planet Labs RapidEye (5 m) and PlanetScope (3 m) constellation to map at local scales (Figure 3, Table 1).

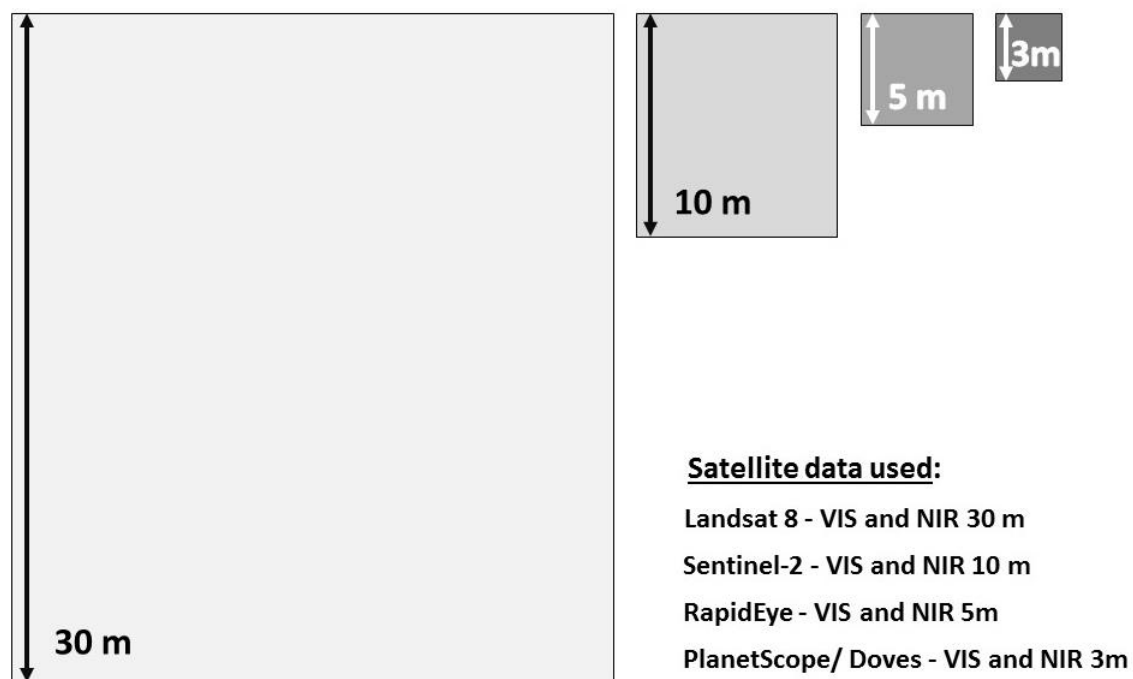


Figure 3. Pixel size (spatial resolution) of the different satellite sensors used in this research. VIS = visible bands, and NIR = near-infrared bands.

Table 1. Satellite sensor spatial and temporal resolution, band number information and data access. Pan = panchromatic band, multi = multispectral bands, thermal = thermal bands.

Sensor/ Platform	bands	Spatial resolution (pan)	Spatial resolution (multi)	Spatial resolution (thermal)	Temporal resolution	Available:
OLI and TIRS/ Landsat-8	11	15 m	30 m	100m	16 days	Earth Explorer- https://earthexplorer.usgs.gov/
MSI/ Sentinel- 2	12		10- 60 m		5 days	Copernicus Open Access Data Hub - https://scihub.copernicus.eu/
RapidEye (Planet)	5		5 m		5.5 days	Rights Lab license
PlanetScope/ Doves (Planet)	4		3 m		daily	Rights Lab license

Landsat-8 OLI

To examine environmental degradation at landscape scales, data was obtained from the longstanding Landsat program (managed by NASA). The Landsat program has acquired, archived, and distributed the longest continuous optical data series, capturing 44 years of global land conditions and dynamics. Since the launch of Landsat-1 in 1972, there have been seven missions in this historic fleet, providing long-term, well-calibrated global multispectral data. This research used Landsat-8 Operational Land Imager (OLI) multispectral data covering eight bands across the visible (blue, green, red), near-infrared, short wave infrared, and thermal infrared part of the spectrum at a spatial resolution of 30 m. Landsat-8 OLI Surface Reflectance (SR) data was downloaded at Level-2 product. In total 57 images were downloaded for this research.

Sentinel-2 MSI

Further examination of environmental degradation at landscape scales was achieved through the use of data captured by the Sentinel-2 constellation. Sentinel-2 is part of the European Space Agency's Copernicus programme; a series of satellites under the family name Sentinel with a policy of free and open-access space-borne data. The twin satellites carry on board the MultiSpectral Imager (MSI), a sensor that samples across thirteen spectral bands in the visible (blue, green, red), near-infrared, and shortwave infrared part of the spectrum at a spatial resolution ranging from 10 - 60 m. The MSI unique band combination importantly includes three vegetation-focussed bands positioned in the red-edge zone (across 705 - 865 nm, at a 20 m spatial resolution). Band coverage of the 'red edge' zone provides key information on the state of vegetation. Sentinel-2 MSI SR data was downloaded at Level-1C product. In total 62 images were downloaded for this research.

Planet Labs

To examine environmental degradation and track change at a high spatial and temporal resolution, data was obtained from RapidEye and the PlanetScope constellation of satellite sensors. The constellation consists of over 120 miniature CubeSats (Doves) operated by Planet Labs, a commercial satellite company. The Doves form the largest satellite constellation in the world, aiming to provide a complete image of Earth once per day at 3 – 5 m optical resolution (four spectral bands - blue, green, red, and near-infrared). The Planet SR product was used in this research, however, the data were

manually screened for haze or low cirrus clouds before being downloaded. In total 249 images were downloaded for this research.

3.2 Models of forest cover trends:

Global Forest Watch

This research adopted data extracted from the online Global Forest Watch (GFW) platform (www.globalforestwatch.org/map). GFW is an open-source online platform and data source which monitors global forest cover and trends in near real-time. Data for Mozambique was extracted at both a country and province level for Tete and Niassa, to assess past tree cover loss/gains (based on Hansen et al., (2013)). This data provided a total estimate for forest cover and forest loss over the time period 2000-2018 and showed a general pattern of forest degradation at both resolutions.

Hewson et al. (2019) predicted forest loss model

Additionally, this research referred to predicted tree cover data freely available to download from Conservation International (<http://futureclimates.conservation.org/index.html>). This 1 km resolution dataset maps and predicts future (2014 - 2029) risk of tree cover loss, based on a business-as-usual scenario, at a continental and global scale (Hewson et al., 2019). Levels of predicted future forest loss were compared with a satellite imagery derived indicator of environmental degradation to assess if the environmental degradation mapped in this research represents a business-as-usual outcome or provides evidence of unpredicted forest loss.

4. Methods

The following section outlines the geospatial processing and analysis methods used in this research (Figure 4.). A general description of the satellite-based approach is first presented, followed by a case study specific outline of the research workflow used to investigate the Tete and Niassa provinces.

4.1 Geospatial analysis approach:

Data Analyses

All satellite data processing and analyses were performed within R version 3.5 (<https://www.r-project.org/>). Standard satellite imagery pre-processing steps were carried out and vegetation indices calculated using the 'Raster' package (Hijmans, 2018) and 'sp' package (Pebesma and Bivand, 2005) in R. ArcGIS Software was used to as a Geographic Information System (GIS) environment for visualisation and mapping outputs.

NDVI – indicator of environmental degradation

This study employed a vegetation indices (applied to the satellite data) to monitor forest loss and environmental degradation. The normalised difference vegetation index (NDVI) is a measurement of the balance between energy received and energy emitted by objects on the Earth's surface. When applied to vegetation, this index establishes a value of 'greenness', representing the quantity of vegetation in an area and its state of health or vigour of growth. For this research

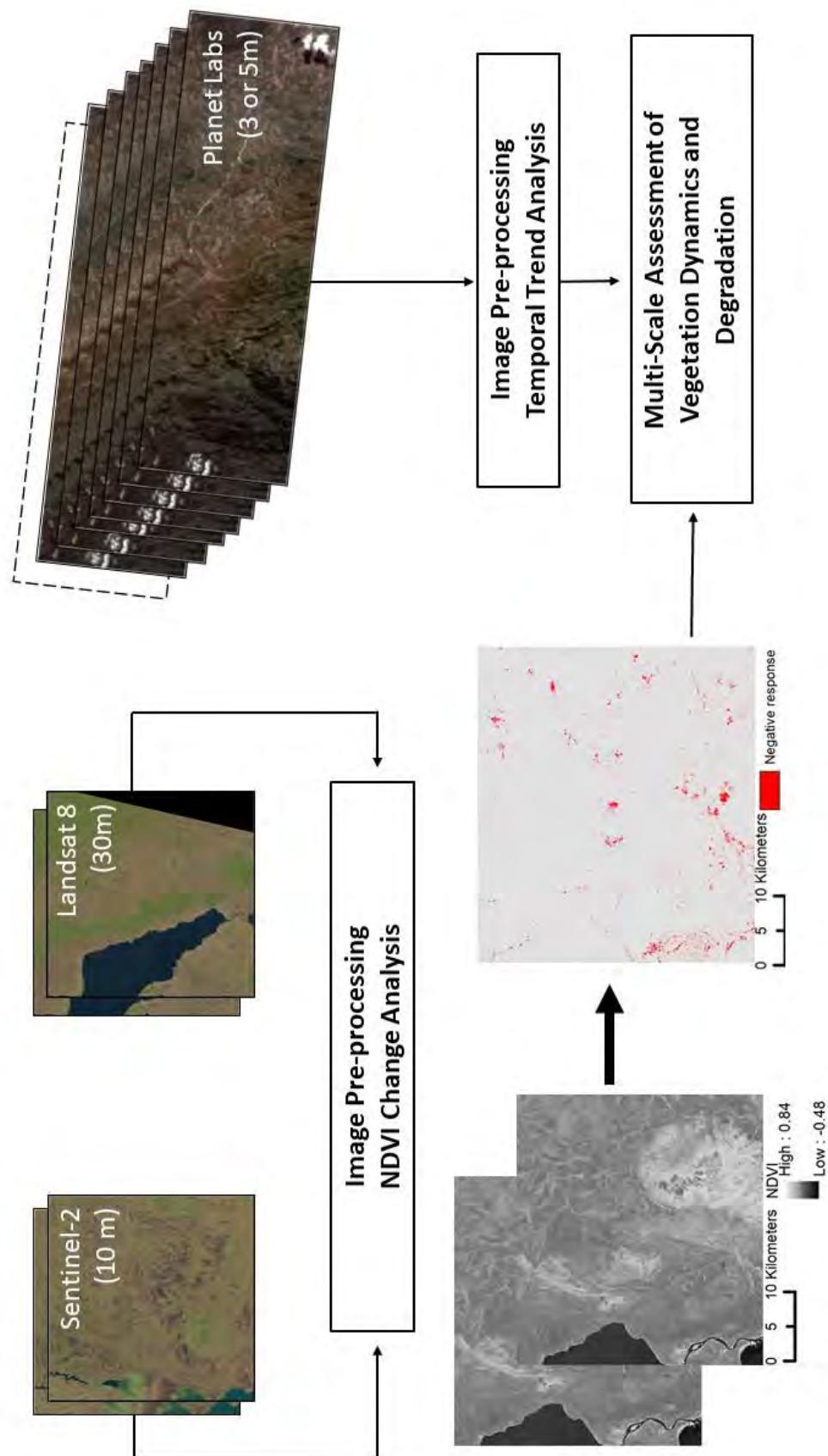


Figure 4. Visual of key satellite data and processing steps included in this study.

environmental degradation, or a decrease in ‘greenness’, is inferred by a decrease in NDVI values, where:

$$NDVI = (NIR - Red) / (NIR + Red)$$

NIR = near-infrared band

Red = red band

Band combination for: **Landsat-8 OLI** Red = band 4, NIR = band 5; **Sentinel-2 MSI** Red = band 4, NIR = band 8; **RapidEye** (Planet Labs) Red = band 3, NIR = band 5; and **PlanetScope** (Planet Labs) Red = band 3, NIR = band 4.

The calculation of NDVI results in a pixel number that ranges from -1 to +1, where zero indicates no vegetation. As values approach +1 (0.8 - 0.9), NDVI values indicate the highest possible density of green leaves (i.e dense forest cover).

NDVI change analysis

To investigate change in forest cover or environmental degradation over a defined time period, NDVI map outputs can be visually compared or a change analysis map calculated by subtracting the most recent NDVI map output from a previous time/year. The satellite data compared must be captured during the same month of the year or growing cycle to minimize the effect of vegetation seasonality and natural fluctuation in light quality. In this research, areas of significant negative change (the highest negative response values) are separated and highlighted in red to aid in the visual interpretation of NDVI change analysis map outputs.

4.2 Case study processing steps:

Tete -

1. Landsat-8 OLI imagery downloaded for 2016 and 2019 was used to generate NDVI maps, followed by an NDVI change analysis. Results were visually inspected in search of significant patterns of environmental degradation.
2. NDVI change analysis outputs were further viewed at key areas of interest identified through the Verité field data collection process (field interviews) (Figure 5). These areas of interest were selected based on interview location, reports of known illegal Nakula wood ‘rosewood’ timber extraction, or reports of illegal transportation of logs.
3. Planet Labs imagery downloaded for the time period of January 2016 – October 2019 was used to generate NDVI maps to track local-scale environmental degradation and assess the impacts of seasonal variability in NDVI values.
4. Areas highlighted as potential environmental degradation was compared with Hewson et al. (2019) forest loss prediction model (high, medium, low risk) to assess if the NDVI change pattern produced from the Landsat-8 OLI imagery was business-as-usual or if it marks a significant increase in environmental degradation/loss of ‘greenness’ which could be a result of the slash and burn methods used in illegal timber extraction of ‘rosewood’ species.

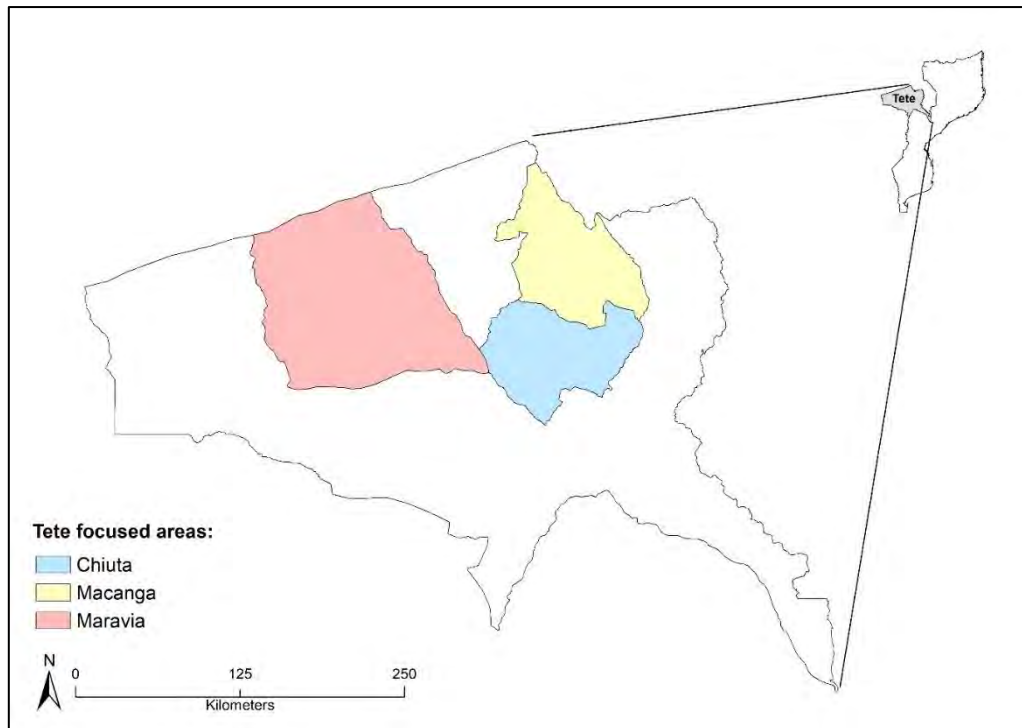


Figure 5. Tete areas of interest for NDVI change analysis informed by Verité field interviews.

Niassa -

1. The EN13 road (connecting Lichinga to Cuamba in the Niassa province) was digitised from very high-resolution satellite imagery accessed from Google Earth TM viewer (open-source), creating a geo-referenced polyline shapefile to base all further environmental degradation analysis around.
2. Multiple buffers were applied at specific distances surrounding the digitised EN13 road polyline. The buffers were used to establish areas (buffer zones) for spatial analysis (Table 2).
3. Sentinel-2 MSI imagery downloaded for 2016 and 2019 was used to generate NDVI maps, followed by the NDVI change analysis. Results were visually inspected in search of significant patterns of environmental degradation surrounding the EN13 road.
4. Areas for further analysis were extracted from the NDVI change output using the buffer zones (9 m, 15 m, 100 m, and 1 km). The percentage area of negative response (inferred environmental degradation) was calculated for each buffer zone for the entire stretch of the EN13 road (Lichinga to Cuamba).
5. Three small areas positioned along an area of identified significant negative response in 'greenness' (inferred environmental degradation) within the 1 km buffer zone were selected at random. The percentage area of negative response (inferred environmental degradation) was calculated for each area.
6. Planet Labs imagery downloaded for the narrow time period of January 2019 - October 2019 was used in a temporal trend analysis to investigate recent hotspots of environmental degradation that have emerged since the EN13 road was paved and opened. The three areas of interest were explored in greater detail, tracking any significant change in the Planet Labs imagery archive to provide an example of the possibilities of this unique databank. Visual inspection sought to track changes in infrastructure, forest removal, agriculture, small settlement development, and introduction of new industries (e.g. mining).

Table 2. Description of buffer zones.

Buffer zones (distance from polyline):	
9 m	The zone of impact of the land taking activates (corridor of impact) as identified in Madimba-Cuamba-Liching, Niassa Province, Mozambique-resettlement action plan (ANE, 2012)
15 m	Area of general site investigations as identified in Madimba-Cuamba-Liching, Niassa Province, Mozambique-resettlement action plan (ANE, 2012)
100 m	Proposed areas of immediate impact
1 km	Surrounding areas of impact, the possible emergence of settlements, forest conversion, or the introduction of new industry (e.g. mining)

5. Results

5.1 Global Forest Watch data overview

A general overview of forest cover and past forest gain/loss was obtained for Mozambique at a country level and for the two case studies Tete and Niassa from GFW. Hansen et al., (2013) derived data showed Mozambique as a whole has experienced increasing tree loss from 2000-2018 (Figure 6, Table 3).

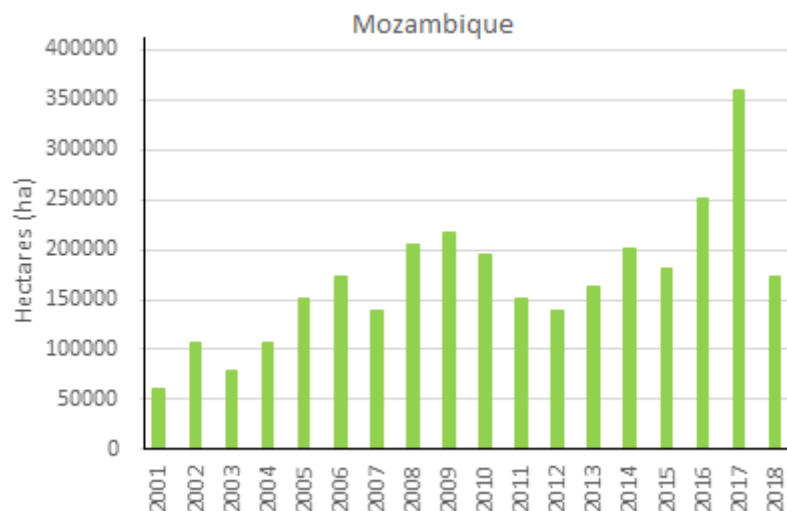


Figure 6. Mozambique tree cover loss for the time period 2001 - 2018, extracted from the Hansen et al. (2013) derived GFW dataset.

Table 3. Country and province-level tree cover gain and loss for the time period 2001-2018, extracted from the Hansen et al. (2013) derived GFW dataset.

Level		Total land area (Mha)	Tree gain 2001-2012 (kha)	Tree loss 2001-2018 (Mha)	Decrease in tree cover 2001-2018 (%)
Country	Mozambique	79.0	145	3.05	11
Province	Tete	10.1	1.3	123	6.9
	Niassa	13.0	0.91	303	5.3

At a province level, the two case studies Tete and Niassa both follow a similar increase in tree cover loss, in particular for the year 2016 - 2018 (Figures 7 and 8). This particular time period, extended to cover 2016 - 2019, is the focus for all further time-series analyses in this report. This recent period of forest loss and degradation is explored in view of the forms of environmental degradation investigated by Verité (field interviews), i.e. the expansion of timber trade in Nakula wood 'rosewood' and the impact of the EN13 road construction.

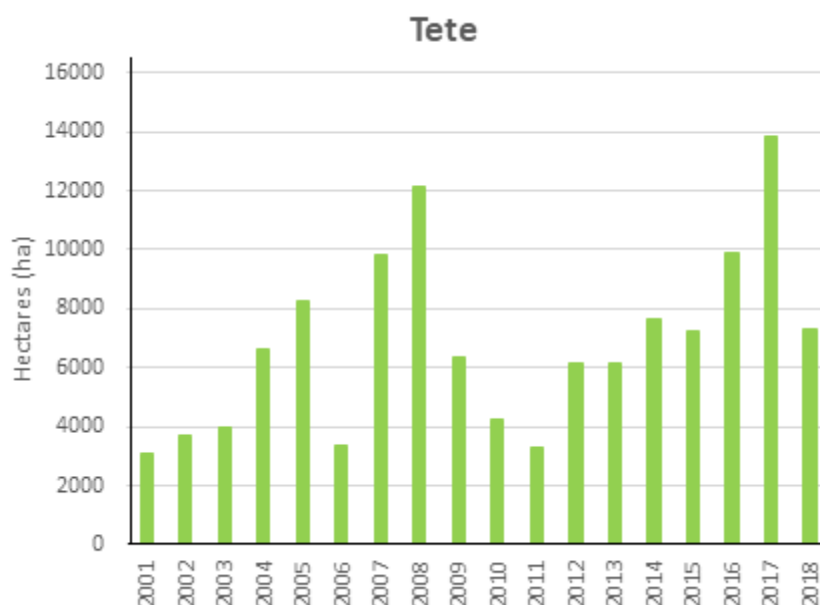


Figure 7. Tete tree cover loss for the time period 2001 - 2018, extracted from the Hansen et al. (2013) derived GFW dataset.

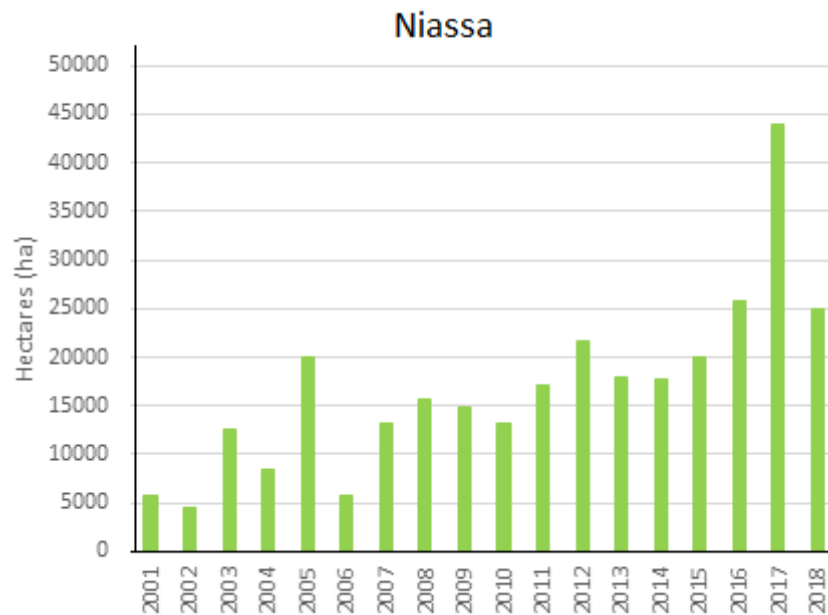


Figure 8. Niassa tree cover loss for the time period 2001 - 2018, extracted from the Hansen et al. (2013) derived GFW dataset.

5.2 Tete case study:

NDVI change analysis (landscape-scale assessment)

Recent trends in environmental degradation were explored via an NDVI change analysis approach using satellite imagery (Landsat-8 OLI 30 m pixel size) for the years 2016 and 2019 for the Tete province as a whole (Appendix B). This relatively short time period represents a significant increase in reported landscape-scale Nakula wood 'rosewood' timber extraction in Tete. Signals of negative response in NDVI change analysis (Figure 9) could be an indication of these activities. A visual inspection of Figure 9. showed a significant negative response (inferred environmental degradation) in areas where Mozambique borders Zambia and Malawi. The scale of forest clear-cutting in association with legal and illegal Nakula wood 'rosewood' timber removal is unknown. Datasets such as Figure 9. are important resources in building a clearer picture of the state of environmental degradation in Tete to further guide future investigations (both in remote sensing and field-based studies).

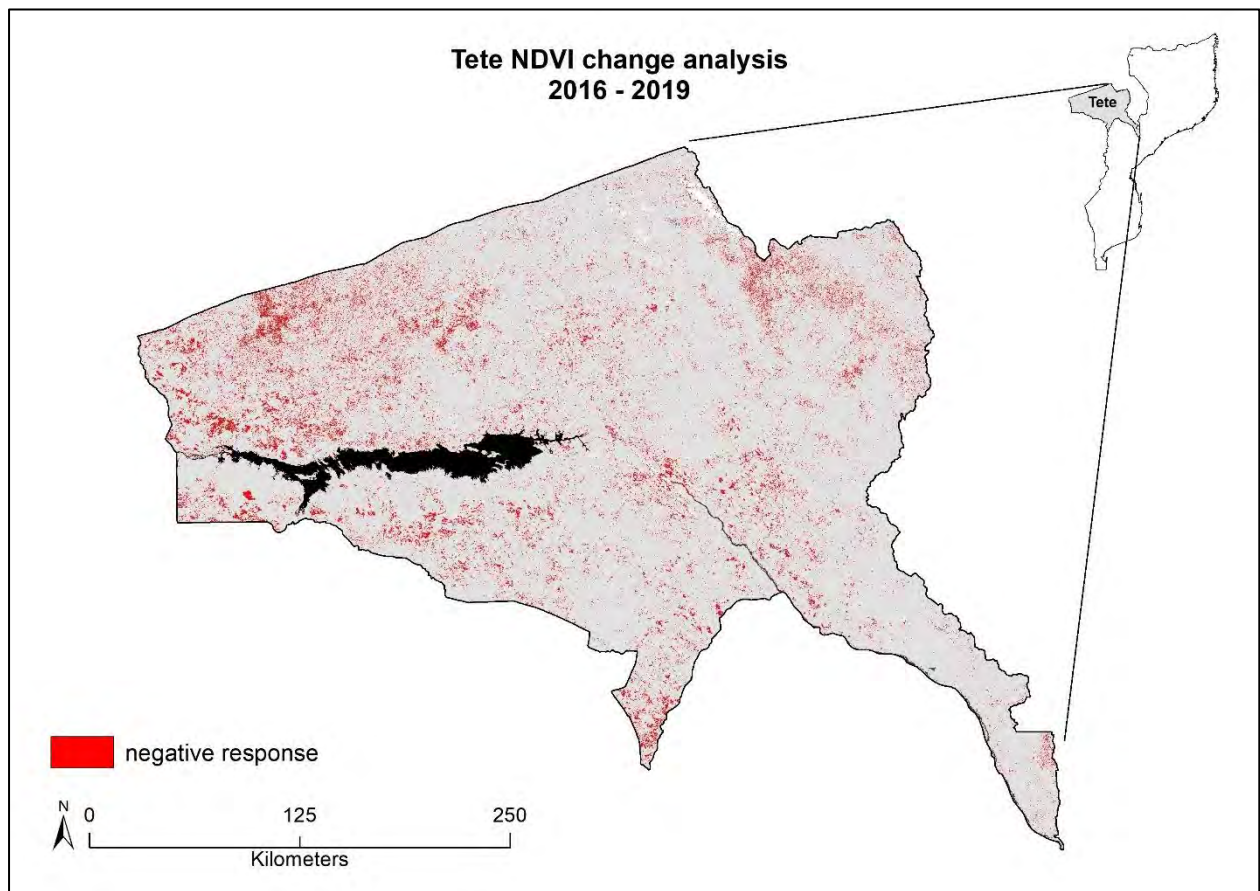


Figure 9. Tete NDVI change analysis 2016 – 2019.

Trends in NDVI were further explored for areas of interest identified by Verité (field interviews), these include: Chiuta, Macanga, Marvia. These areas of interest were selected based on interview location, reports of known illegal Nakula wood ‘rosewood’ timber extraction, or reports of illegal transportation of logs. Figures 10, 11, and 12. give a general view of ‘greenness’ (healthy green vegetation = high NDVI values) for the year 2016 and 2019, as well as a change analysis map for this time period. All three areas have experienced landscape-scale environmental degradation in the last 4 years, whether this is a result of forest clear-cutting is unknown without detail ground-truth data.

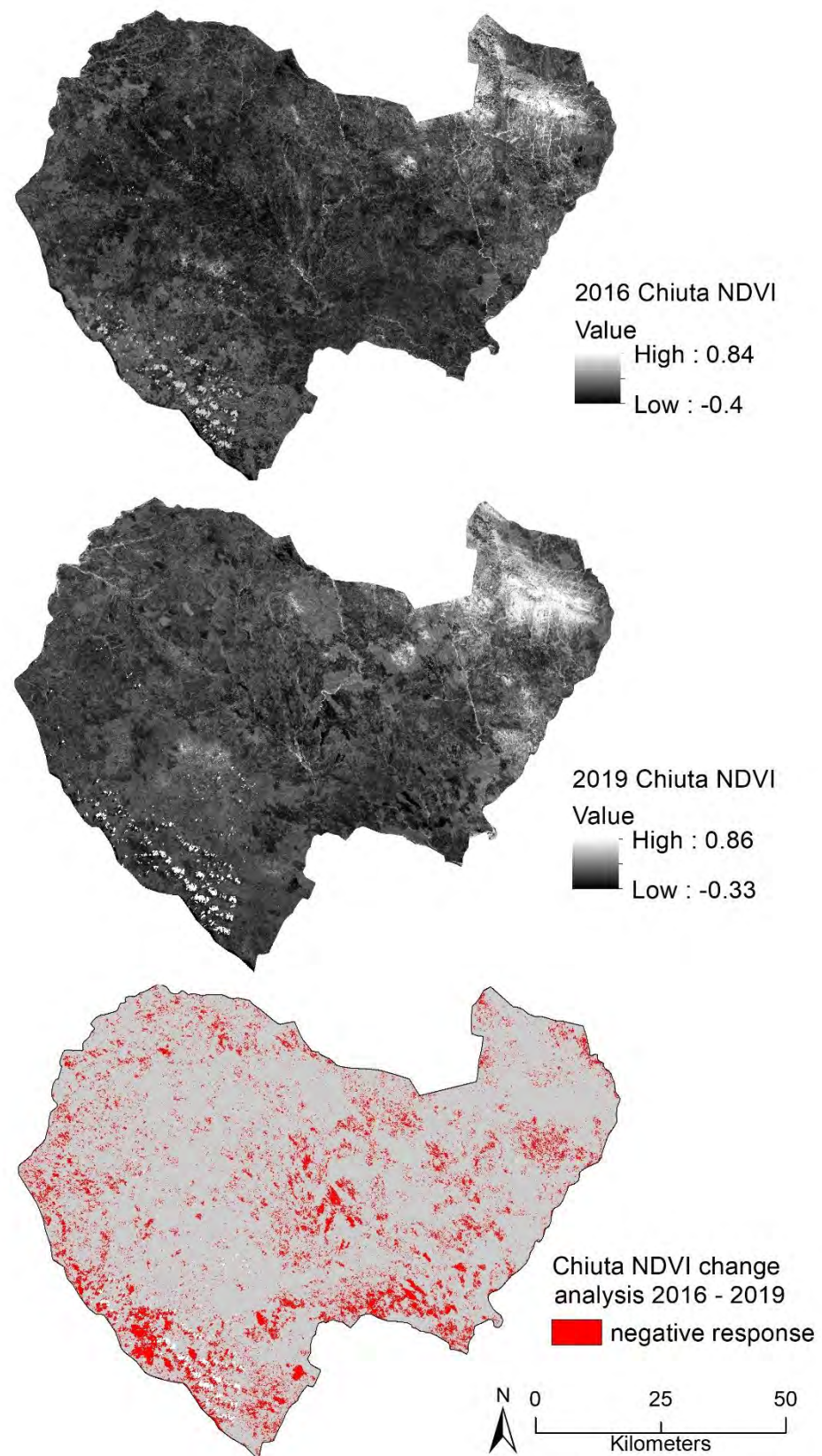


Figure 10. Chiuta 2016 NDVI map, 2019 NDVI map, and NDVI change analysis map.

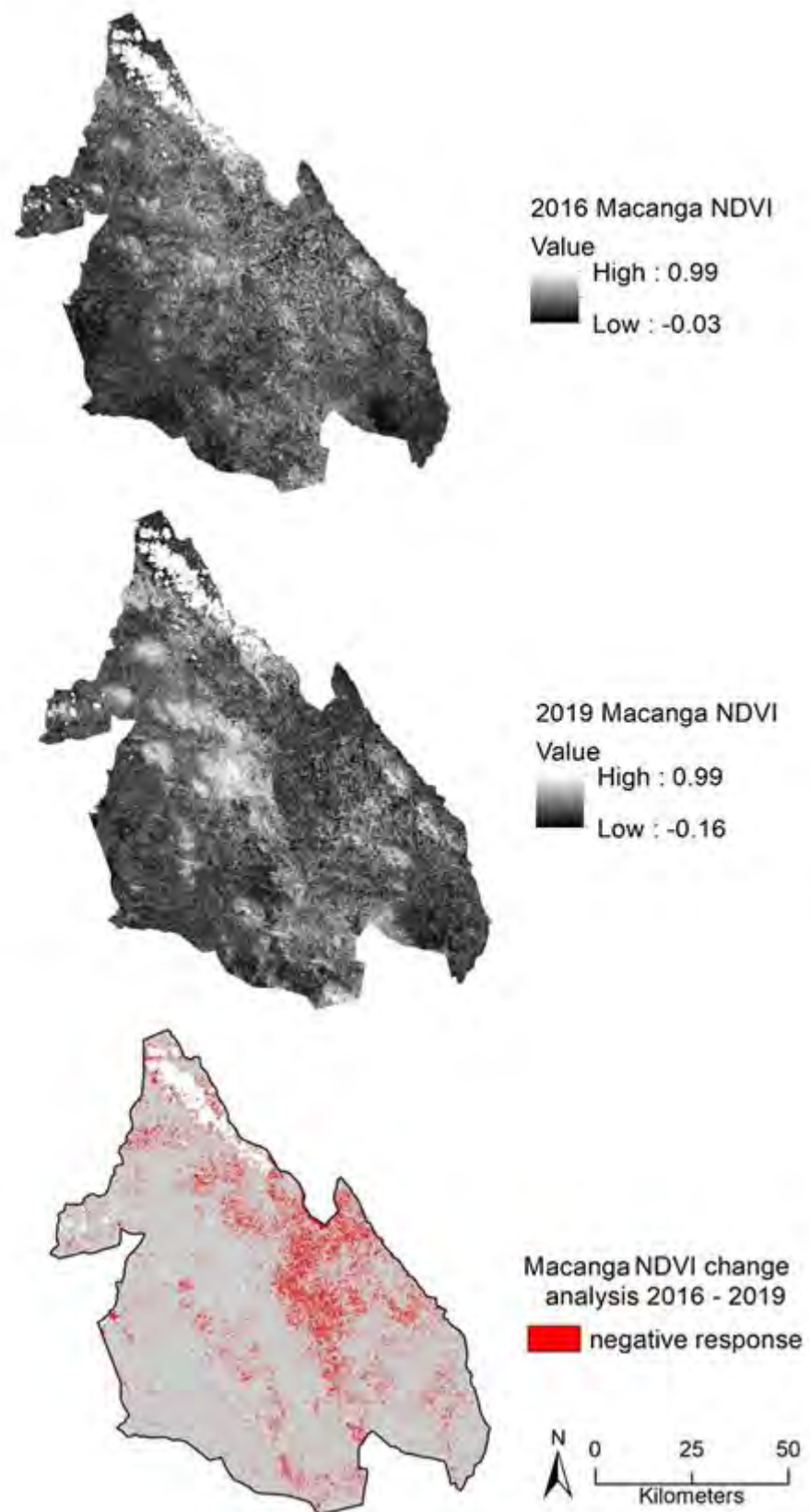


Figure 11. Macanga 2016 NDVI map, 2019 NDVI map, and NDVI change analysis map.

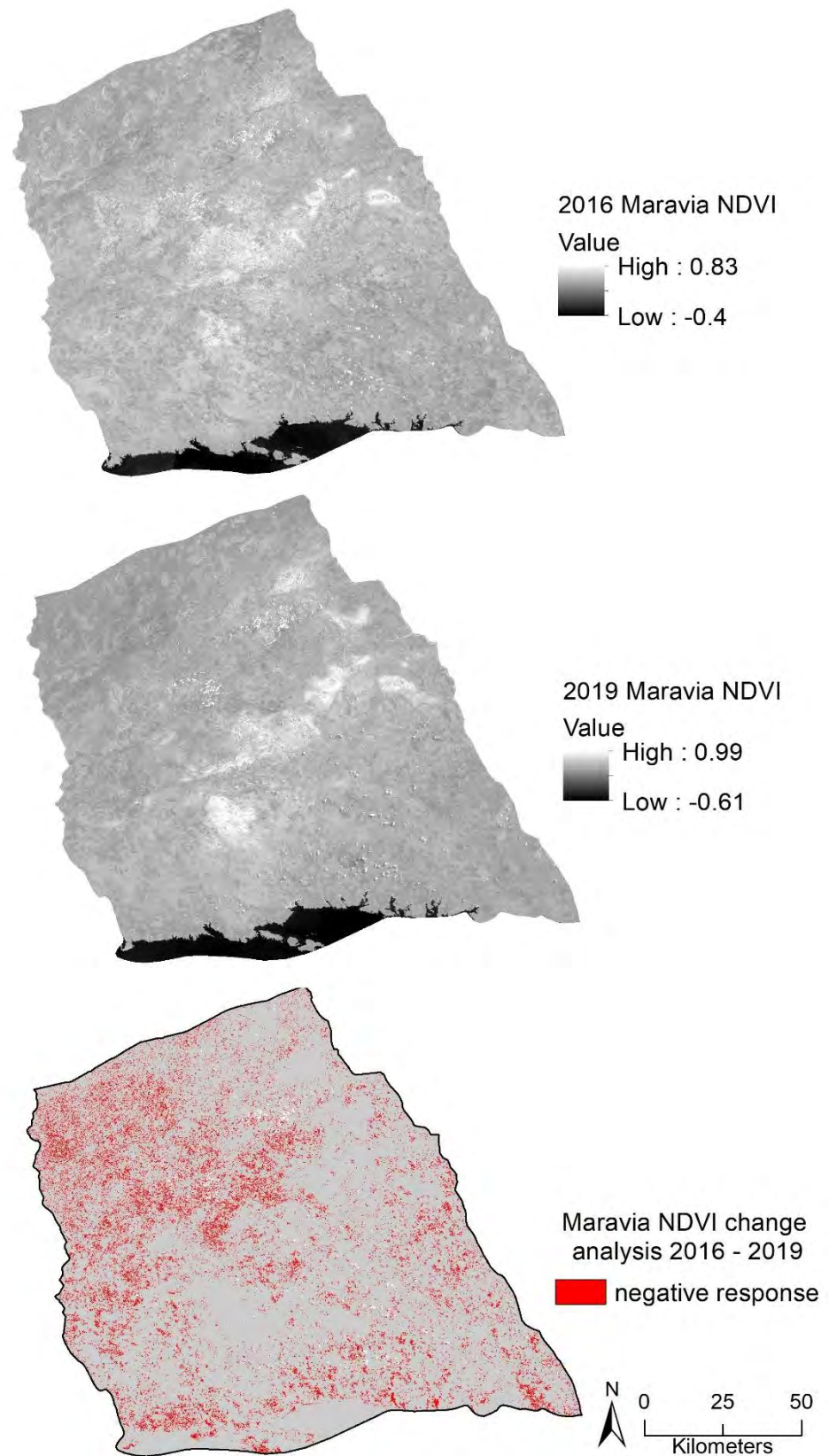


Figure 12. Maravia 2016 NDVI map, 2019 NDVI map, and NDVI change analysis map.

NDVI change analysis (local-scale assessment)

A more focused analysis of key areas of forest degradation was performed using Planet Labs imagery. The locations were informed from the results of the Tete (Chiuta, Macanga, Maravia) NDVI change analysis, i.e. areas that were identified as a negative response. Planet Labs scenes (PlanetScope and RapidEye) were downloaded for the time period of January 2016 – October 2019 and processed to produce NDVI maps. This NDVI time series demonstrates the natural seasonal growth cycle of green vegetation in Tete, a highly seasonal growth cycle (wet and dry season dependent), as well as a key time period of potential forest degradation in association with forest clear-cutting activities.

Figure 13. illustrates the NDVI response for five different land covers, where three of the land covers are examples of areas that remained stable over the 4 years (forest, grassland, and agriculture) and two classes are examples of active areas of change (forest to agriculture, and forest to grassland). The noise in the time-series data makes it challenging to infer forest degradation or change due to the high seasonality of vegetation in this landscape. Values were extracted and viewed for specific months that were regularly sampled to examine permanent forest change, Figure 14. provides an example for the month of May for the five land covers.

Table 4. provides an example of the range in NDVI values for stable areas (forest, grassland, and agriculture); this information is vital to inform and guide future satellite NDVI analysis across larger spatial and temporal scales.

Table 4. NDVI range and average values recorded for the stable land cover examples for the 4 years (2016 – 2019).

Land cover	Range (min/max)	Average
forest	-0.07/0.64	0.30
grassland	-0.09/0.37	0.06
agriculture	-0.07/0.30	0.07

Restrictions on the research reduced the time available to demonstrate the full capabilities of Planet Labs constellation of CubeSats to monitor vegetation dynamics at high spatial (~3 m) and temporal (~daily) resolution across the entire area of interest. The example presented in Figure 15. visually demonstrates the rich detail of PlanetScope data for capturing NDVI dynamics and track associated environmental impact.

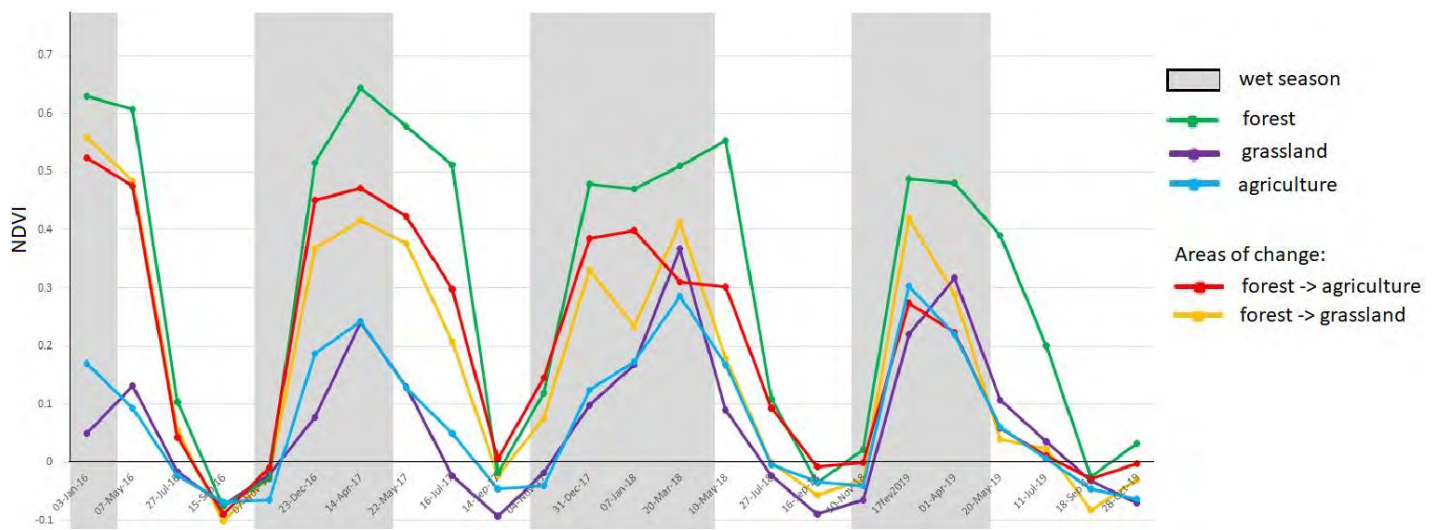


Figure 13. NDVI values for five different land surfaces derived from Planet Labs imagery. NDVI values are tracked for the time period of January 2016 – October 2019. Months situated in the wet season are highlighted in grey.

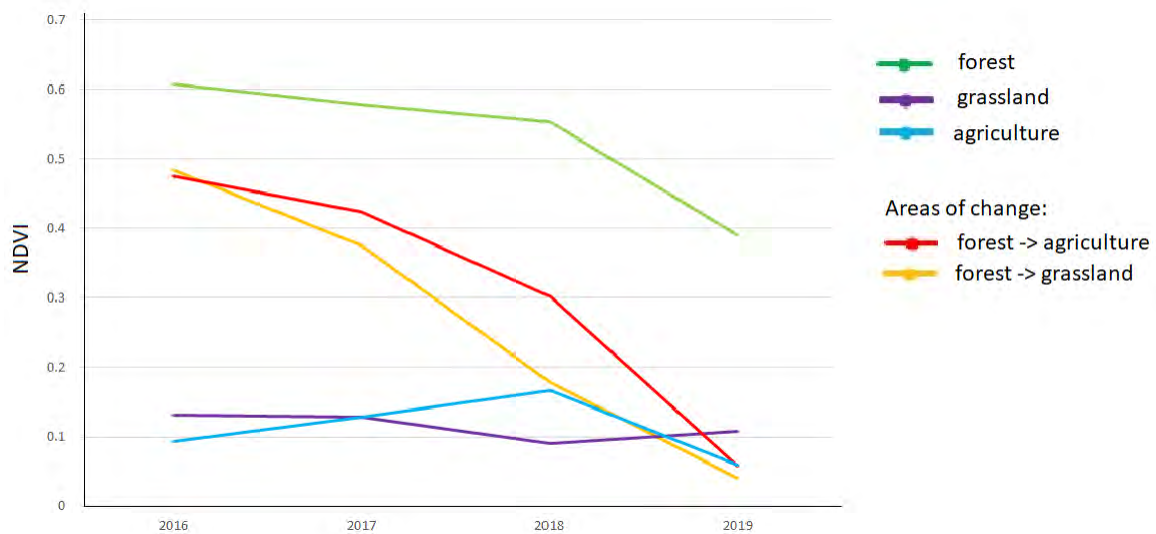


Figure 14. NDVI values for five different land surfaces for the month of May derived from Planet Labs imagery (2016 – 2019).

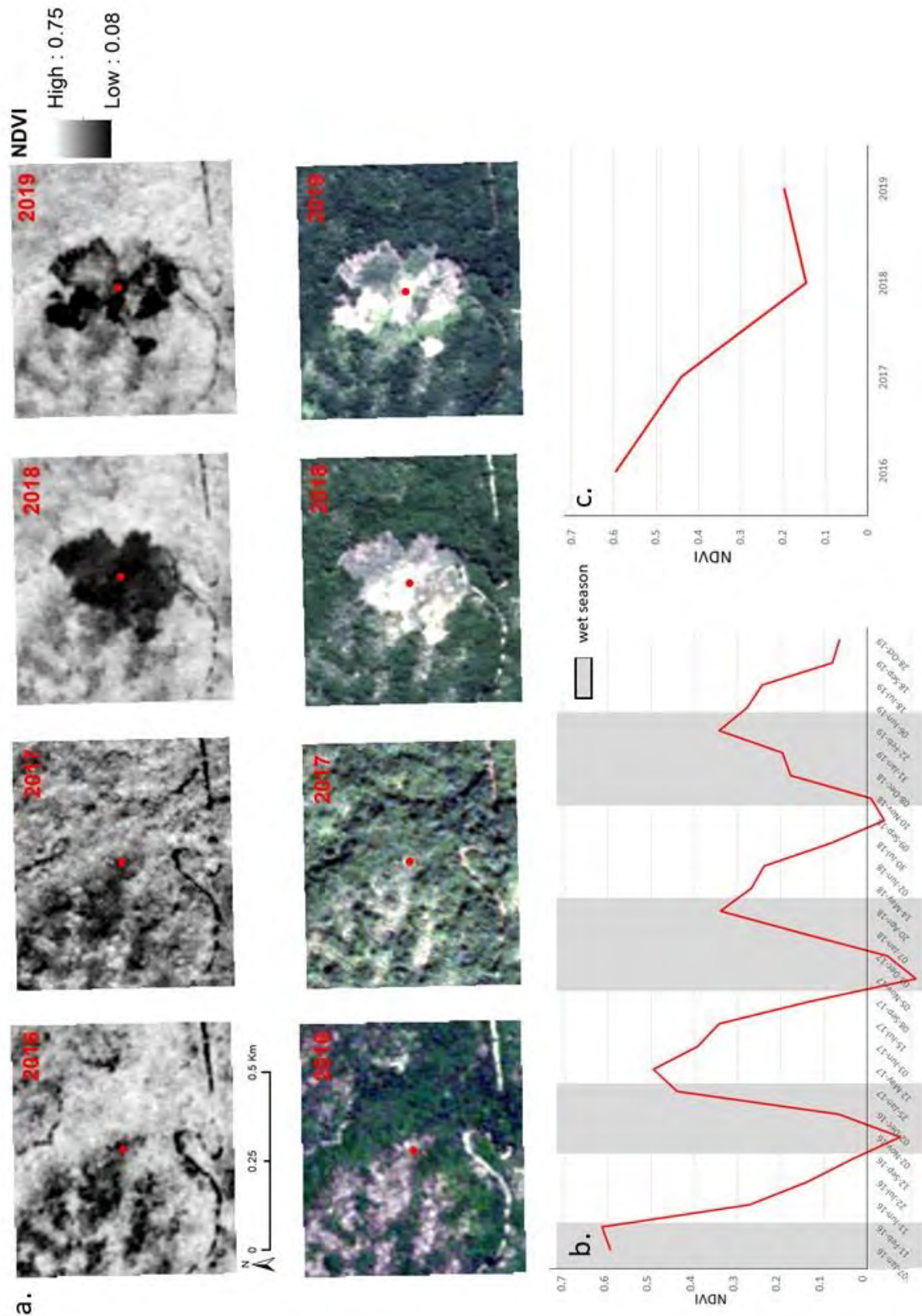


Figure 15. Example area of change in forest condition from 2016 to 2019; a. the red marker locates the sample point NDVI measurements are recorded from, the top row represent yearly NDVI for the month January derived from Planet Labs imagery, the bottom row represent yearly Planet Labs imagery (RGB) for the month January; b. full Planet Labs NDVI time series; c. NDVI values for the month of January derived from Planet Labs imagery (2016 – 2019).

Hewson et al., (2019) forest loss prediction and NDVI change analysis map comparison

The NDVI change analysis (2016 – 2019) map output was overlaid against and the Hewson et al., (2019) model for the area covering the province of Tete. The majority of areas in Tete corresponding to a negative response in vegetation ('greenness') change, and therefore a measure of potential degradation, were predicted at a mid-risk level from the Hewson et al., (2019) model (Table 5). 28.4% of the areas highlighted as a negative change in Tete were located in areas of low risk, suggesting that for these areas the most recent examples of environmental degradation are a result of not business-as-usual forest activities. This could include the clear-cutting methods of illegal timber extraction of Nakula wood.

Table 5. % area of NDVI negative change covering the Hewson et al., predicted forest loss model divided into high, mid, and low risk classes.

	% area of NDVI negative change covering Hewson et al. (2019) predicted forest loss		
	High risk	Mid risk	Low risk
Tete	20.5%	51.1%	28.4%
Chiuta	36.2%	50.7%	13.1%
Macanga	0.4%	79.6%	20.0%
Maravia	5.7%	66.6%	27.7%

5.3 Niassa case study:

Geospatial processing

The EN13 road was digitised from Google Earth TM imagery, creating a polyline to position all further analysis around (Figure 16). Buffers around the EN13 road polyline were generated at different distances – 9 m, 15 m, 100 m, 1 km. An example of an output segment showing the buffers around the road polyline is displayed in Figure 17.

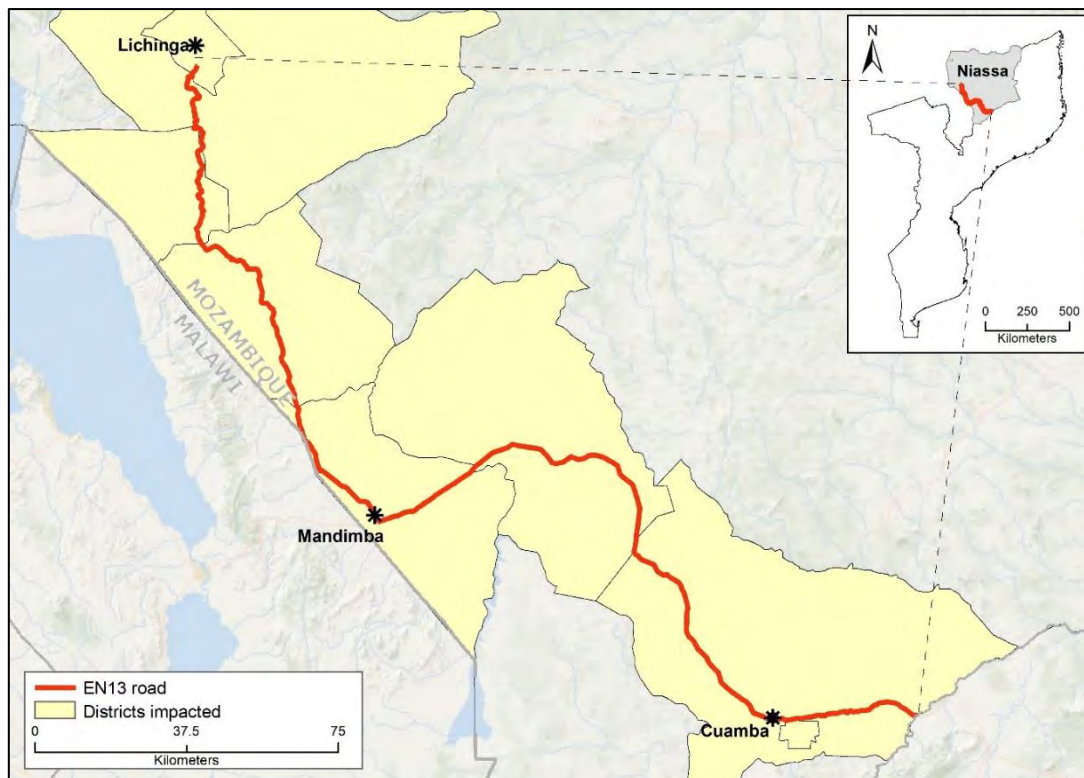


Figure 16. EN13 road section connecting Lichinga to Cuamba in Niassa province.

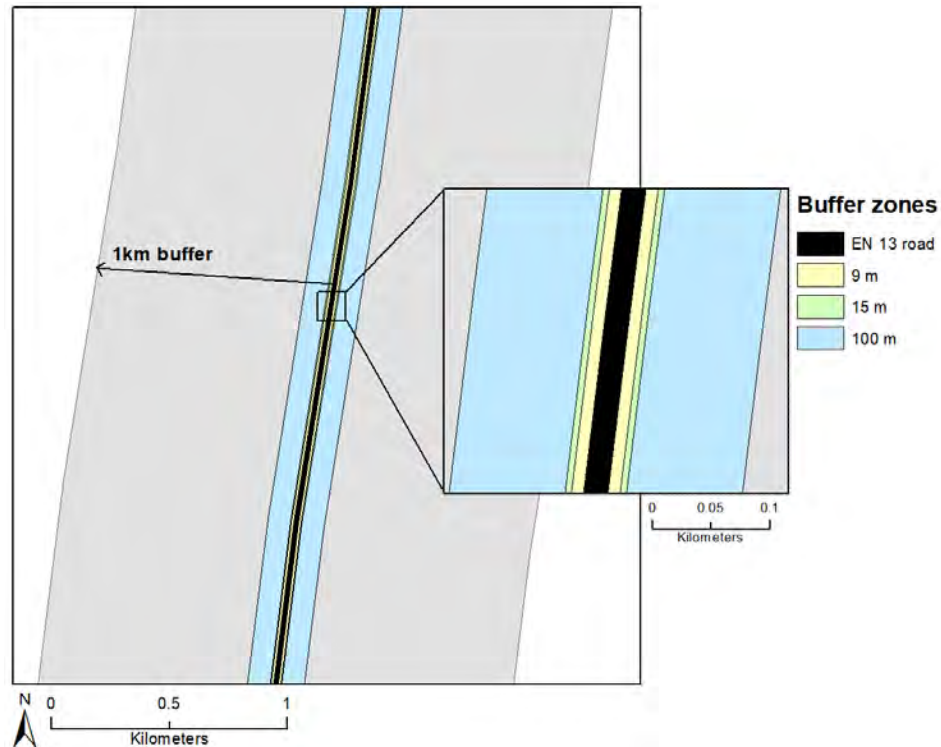


Figure 17. Buffers around the EN13 road polyline – 9m, 15m, 100m, 1km.

NDVI change analysis (landscape-scale assessment)

Recent trends in environmental degradation were explored via an NDVI change analysis approach using satellite imagery (Sentinel-2 MSI 10 m pixel size) for the years 2016 and 2019 for land surrounding the EN13 road in the Niassa province (Appendix B). Figure 18 i. shows the NDVI change analysis output at the satellite imagery extent, this provides a general view of the environmental degradations (areas highlighted in red) in the districts surrounding the EN13 over the last 4 years of road development planning, construction, and opening. A visual inspection of Figure 18 i. indicates a significant negative response in 'greenness' for areas connecting Lichinga to Mandimba.

The buffer zones (9 m, 15 m, 100 m, and 1 km) were applied to the NDVI change analysis output to focus on areas immediately impacted by the EN13 road (Figure 18 ii). Table 6. shows the percentage area of significant negative change (inferred environmental degradation) for the areas in the buffer zones for the entire stretch of the EN13 road (>300 km) between the years 2016 and 2019.

Table 6. Area of negative response from the NDVI change analysis 2016 -2019 for the four different buffer zones.

Buffer	Area of negative response (Km ²)	% negative response
9 m	0.6743	5.16
15 m	0.8496	5.20
100 m	3.3804	4.32
1 km	28.3733	4.4

It is important to note here that only two dates in time are compared, October 2016 and October 2019, thus any environmental degradation or environmental regeneration that could have taken place between this time period may not be fully represented. Additionally, at a 10 m pixel size, finer-scale environmental degradation (in particular for areas captured in the 9m and 15m buffer zone) may not be represented.

Due to time constraints on this research, the full EN13 road could not be analysed in detail. Instead, three small areas positioned along the EN13 connecting Lichinga to Mandimba (previously identified as an area of significant negative change) were selected at random (Table 7). Figure 18 ii. shows the positioning of the three areas (a, b, and c) and the NDVI change analysis area within the 1 km buffer.

Table 7. Area of negative response from the NDVI change analysis 2016 -2019 with the 1 km buffer zone for the three areas (a, b, and c).

	Total area (km ²)	Negative response area (km ²)	% negative response
a	8.44	0.64	7.62
b	9.86	1.87	18.98
c	3.93	0.40	10.09

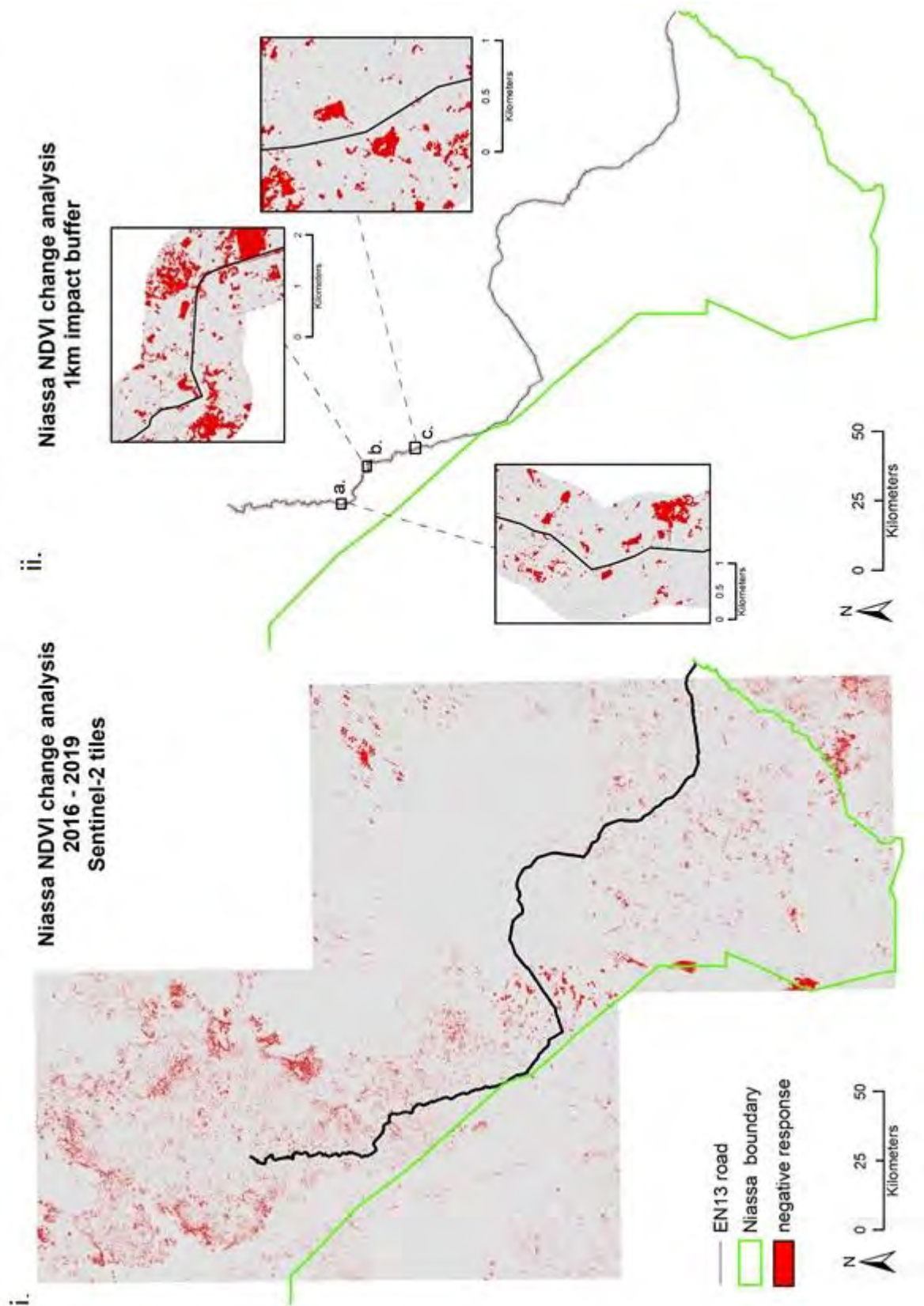


Figure 18 i. - Niassa NDVI change analysis 2016 – 2019 output at the satellite imagery extent; ii. - the positioning of the three areas (a, b, and c) and the NDVI change analysis area within the 1 km buffer.

Initial impact of EN13 road construction and opening (local-scale assessment)

To investigate the initial impact of the EN13 road opening, the Planet Labs imagery archive was explored in view of the three areas of interest (a, b, and c) for the time period of January 2019 – October 2019. This one-of-a-kind data source can monitor change on the ground daily at 3 m. With this spatial and temporal resolution we can detect and monitor new developments potentially as a result of either improved access to remote areas or the movement of people and livelihoods.

Temporal trend analysis of the Planet Labs imagery archive revealed the rapid development of the areas (Figure 19, 20, 21). This is particularly visible in the rise of mining activities and informal settlements. The rapid development in mining activities along the EN13 points to a potential change in the local population's livelihoods, potentially linked to labour abuses or forms of modern slavery. These examples highlight the power of satellite data in tracking change, equipping organisations such as Verité with the data necessary to make informed, and timely decisions on at-risk locations/activities and the geospatial information necessary to guide further ground-based collection.

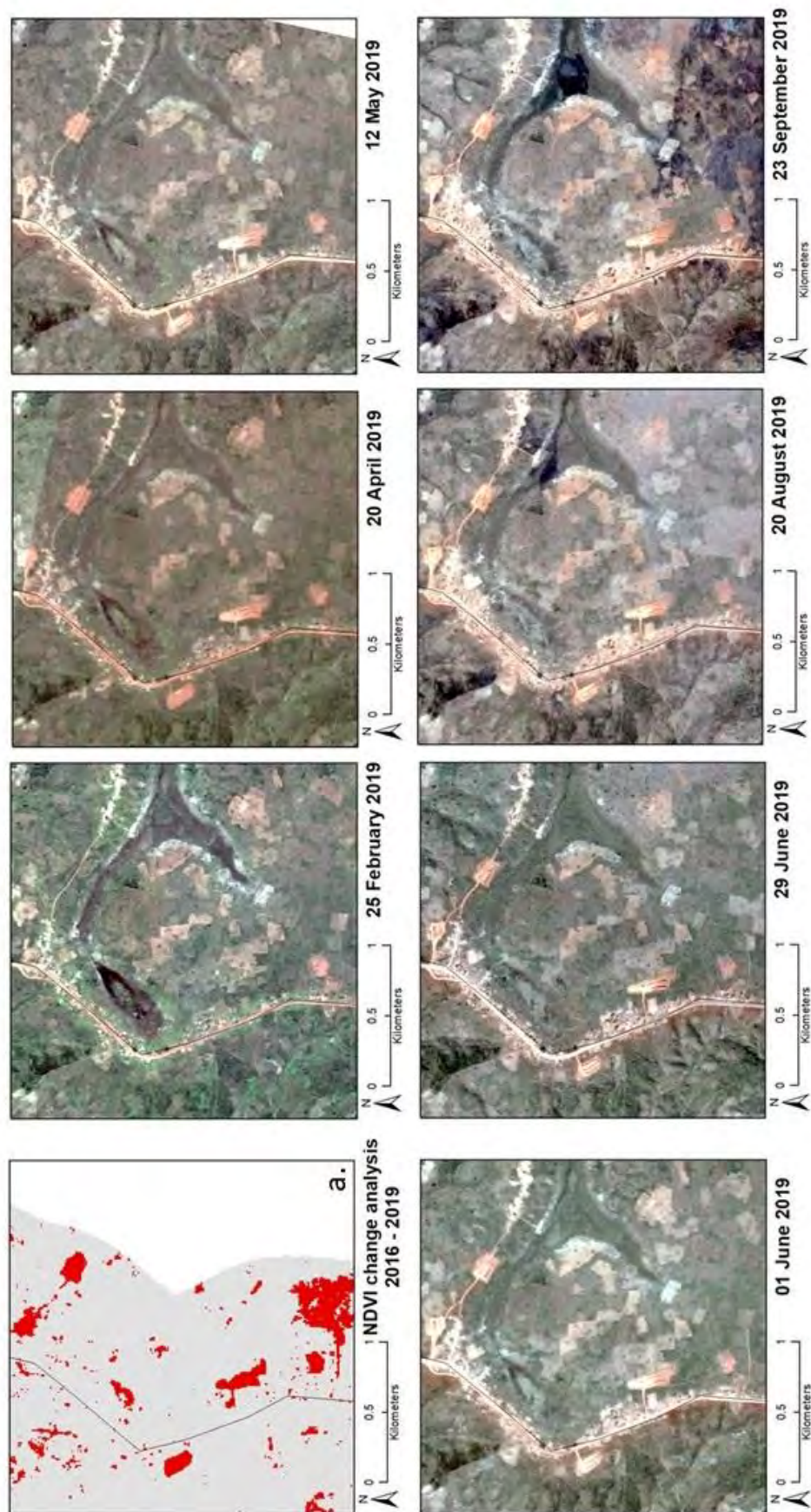


Figure 19. Planet Labs imagery (RGB) tracking change in area a.

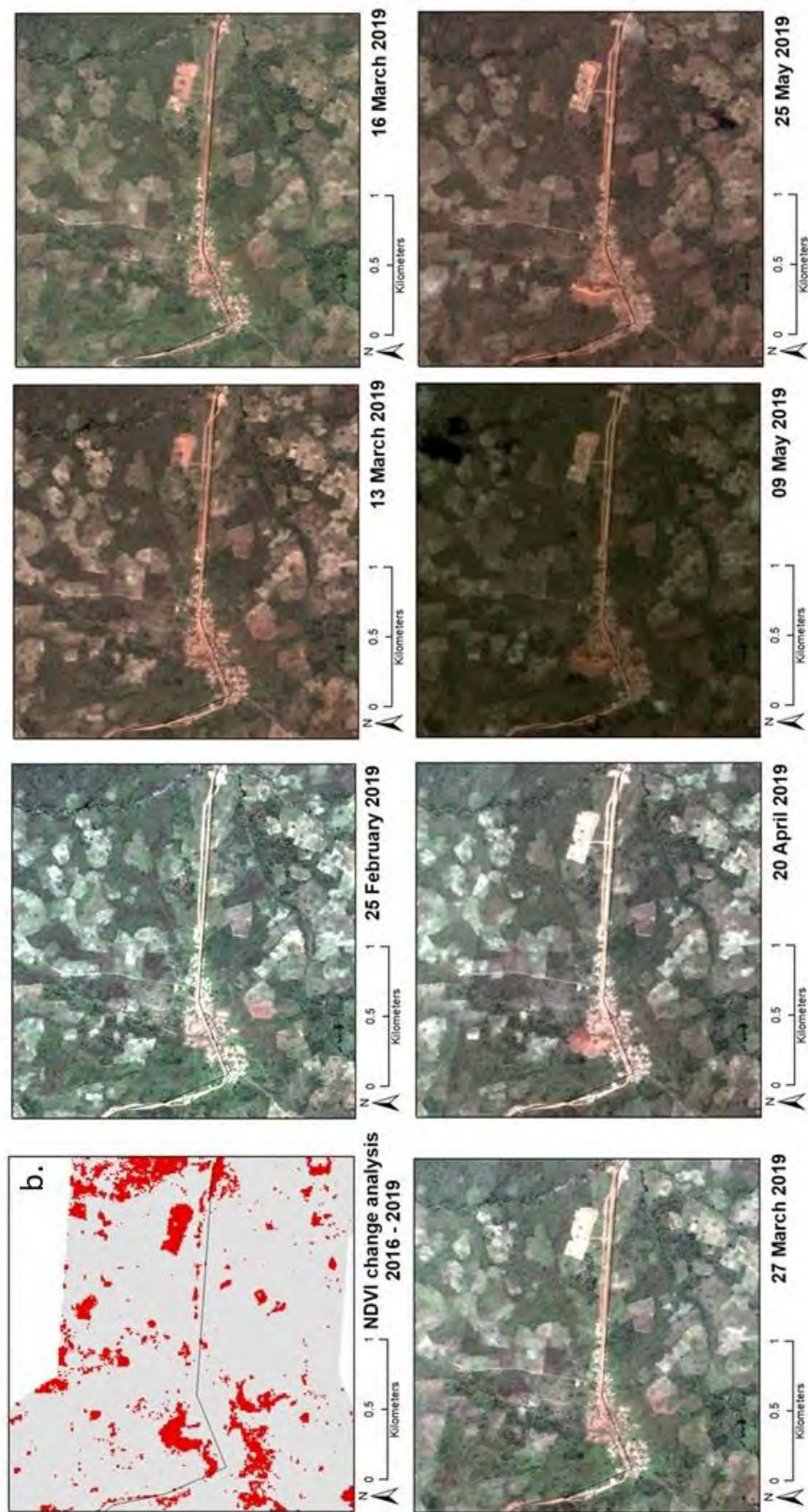


Figure 20. Planet Labs imagery (RGB) tracking change in area b.

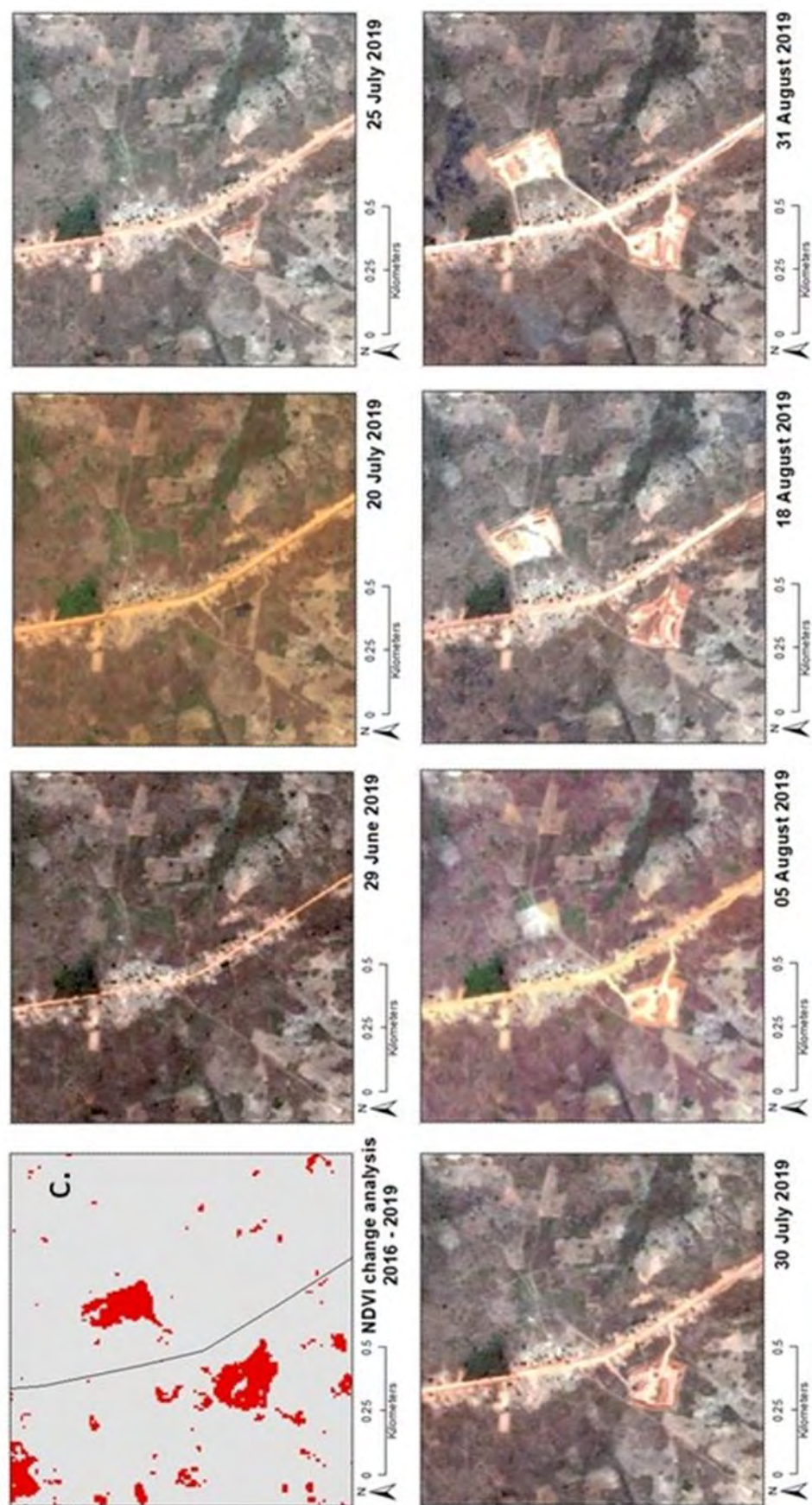


Figure 21. Planet Labs imagery (RGB) tracking change in area c.

6. Discussion and Conclusion

The aim of this study was to support Verité's qualitative field research into labour abuses associated with activities of environmental degradation in Mozambique with state-of-the-art satellite and geospatial data. It is hoped that the evidence of environmental degradation and land cover change built in this study will encourage further development into the use of satellite data in humanities research. In particular, to explore the nexus between modern slavery and environmental degradation.

Future work should build on:

- Spatial assessment of the impact of land cover change - for example resettlement, loss of natural resources (forest, minerals and metal, agriculture, etc.), and infrastructure development.
- Spatial assessment of the impact of environmental degradation - for example tracking the deforestation of rosewood species like Nakula wood.
- Environmental risk assessment and prediction of vulnerable populations. This is based upon the idea that degradation of natural resources will impact local livelihoods and push vulnerable people into potentially exploitative work.

Further work building on this initial scoping study (Appendix C.) is vital to support and develop our spatial understanding of both environmental and anti-slavery activities. Along with meeting natural resource management, policy and research data needs.

This research project was ultimately constrained by the lack of ground-truth data to inform and guide the mapping exercise. The lack of ground-truth data reduced our technical abilities to explore just general patterns of forest and vegetation degradation. The visual analysis of map outputs is also highly subjective without ground intelligence to base analyses on. A more coordinated research approach should be adopted in future work to ensure accurate results, and realise the full potential of remote sensing data and technology. Time was also a major limiting factor. The labour-intensive task of searching satellite data archives and downloading data limited the time available to carry out further fine-scaled assessments. Future work should account for this.

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Appendix A.

Supplementary data:

- Mozambique land cover – ESA Climate Change Initiative product

Land cover map produced by the European Space Agency Climate Change Initiative-Land Cover (ESA CCI-LC) project (available to download at: <http://2016africalandcover20m.esrin.esa.int/>). This product is a prototype for a high resolution (20 m) land cover map over Africa based on 1 year of Sentinel-2A scenes from December 2015 to December 2016.

Copyright notice: © ESA Climate Change Initiative - Land Cover project 2014 – 2017

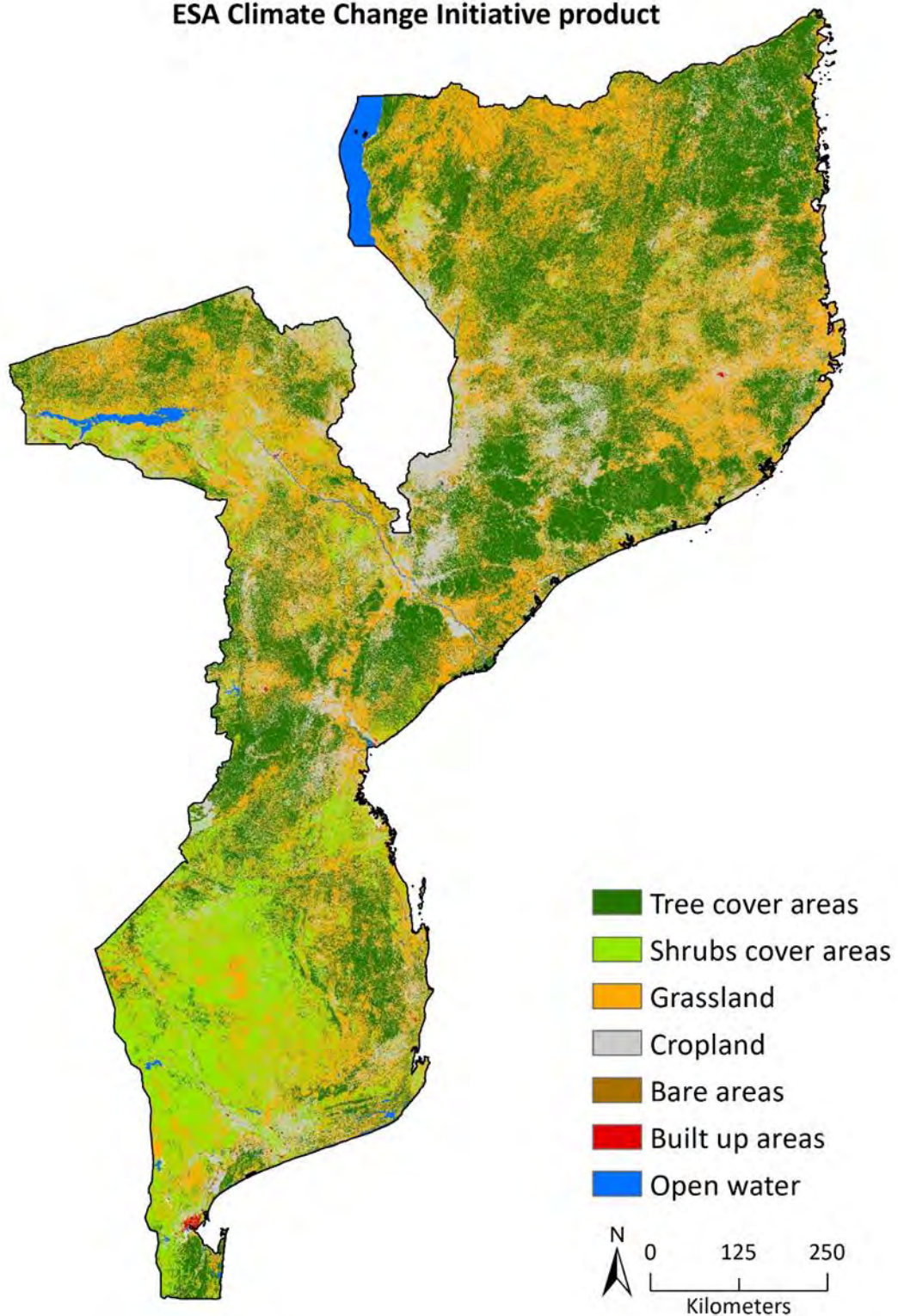
- Mozambique 2000's biomass map, Avitabile et al., (2016)

Biomass map produced by Avitabile et al., (2016) (available to download at: <http://lucid.wur.nl/datasets/high-carbon-ecosystems>). This product is an integrated pan-tropical map of biomass (in woody vegetation) created from multiple reference datasets (Baccini et al., 2012; Saatchi et al., 2011) representative of the first decade of the 2000s.

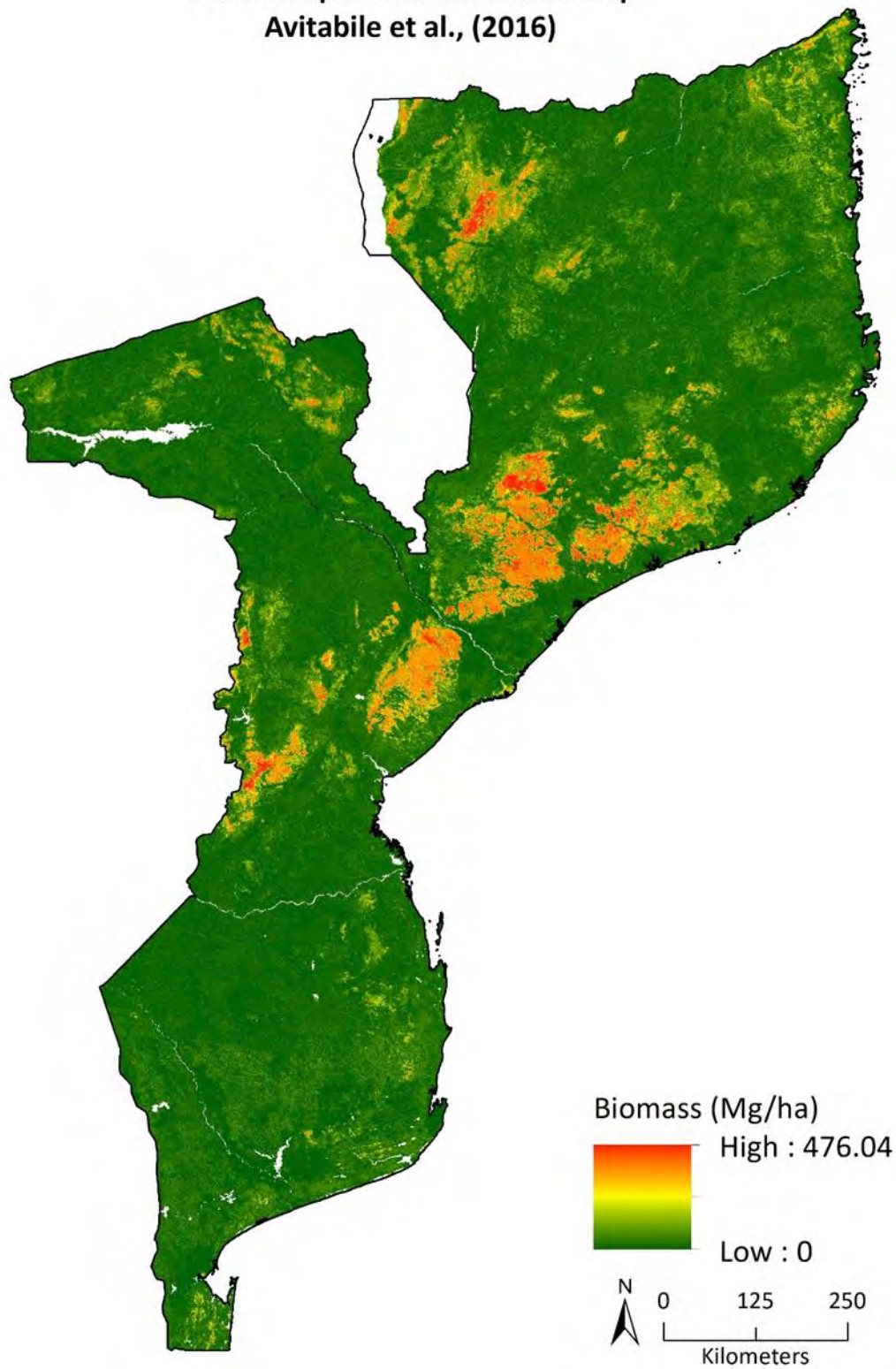
- Mozambique predicted tree cover loss, Global prediction model by Hewson et al., (2019)

Predicted tree cover data freely available to download from Conservation International (<http://futureclimates.conservation.org/index.html>). This 1 km resolution dataset maps and predicts future (2014 - 2029) risk of tree cover loss, based on a business-as-usual scenario, on a global scale (Hewson et al., 2019).

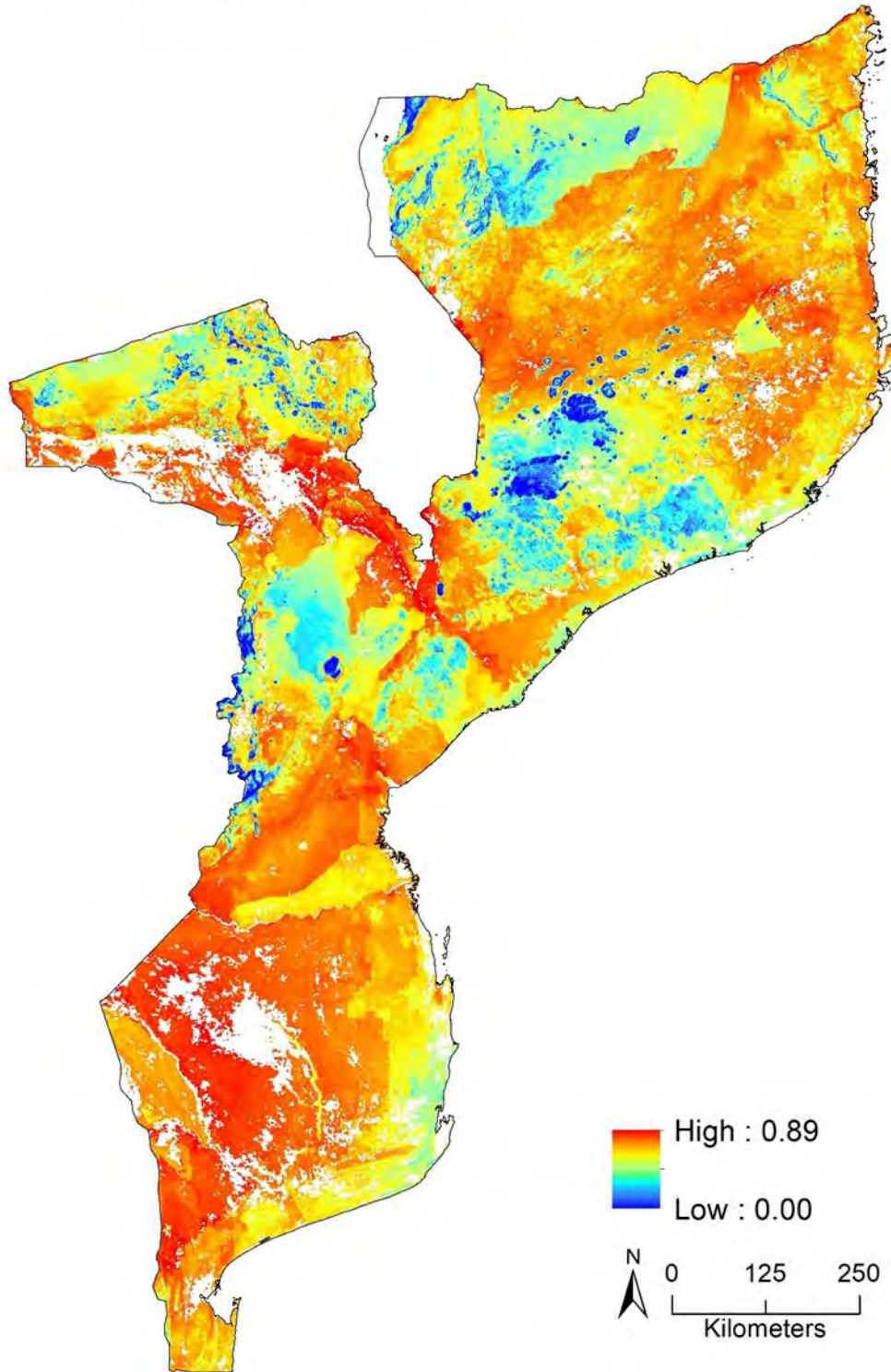
Mozambique land cover
ESA Climate Change Initiative product



Mozambique 2000's biomass map
Avitabile et al., (2016)



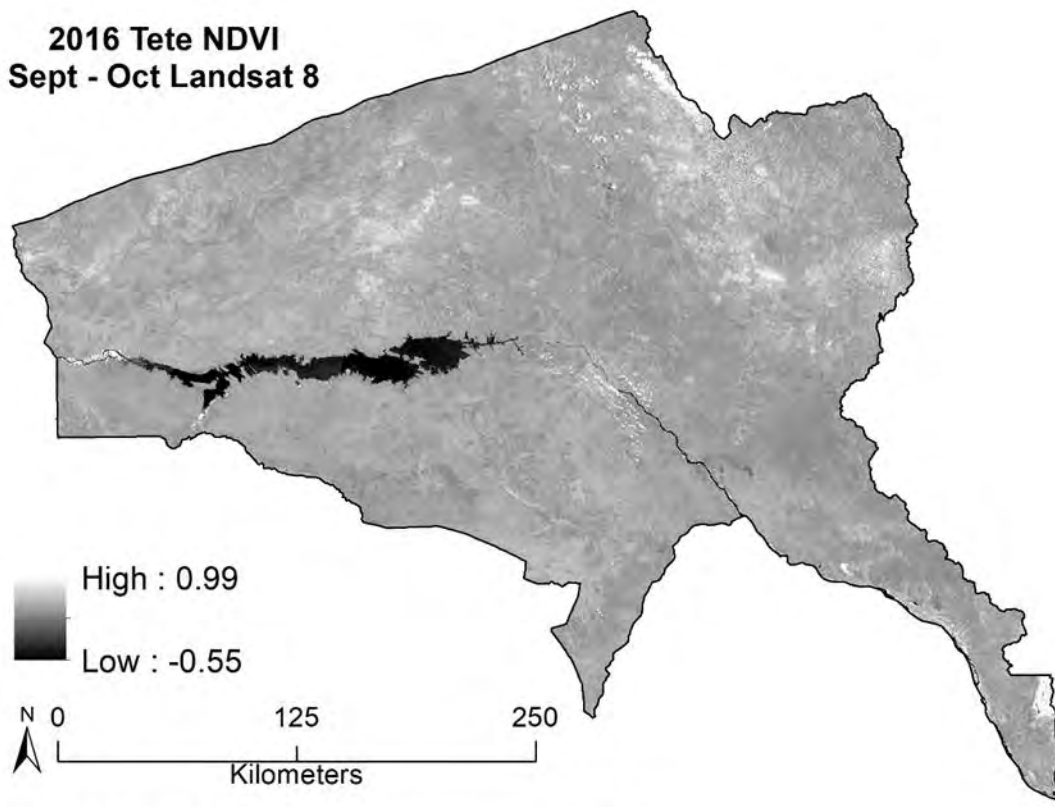
Mozambique predicted tree cover loss
Global prediction model by Hewson et al., (2019)



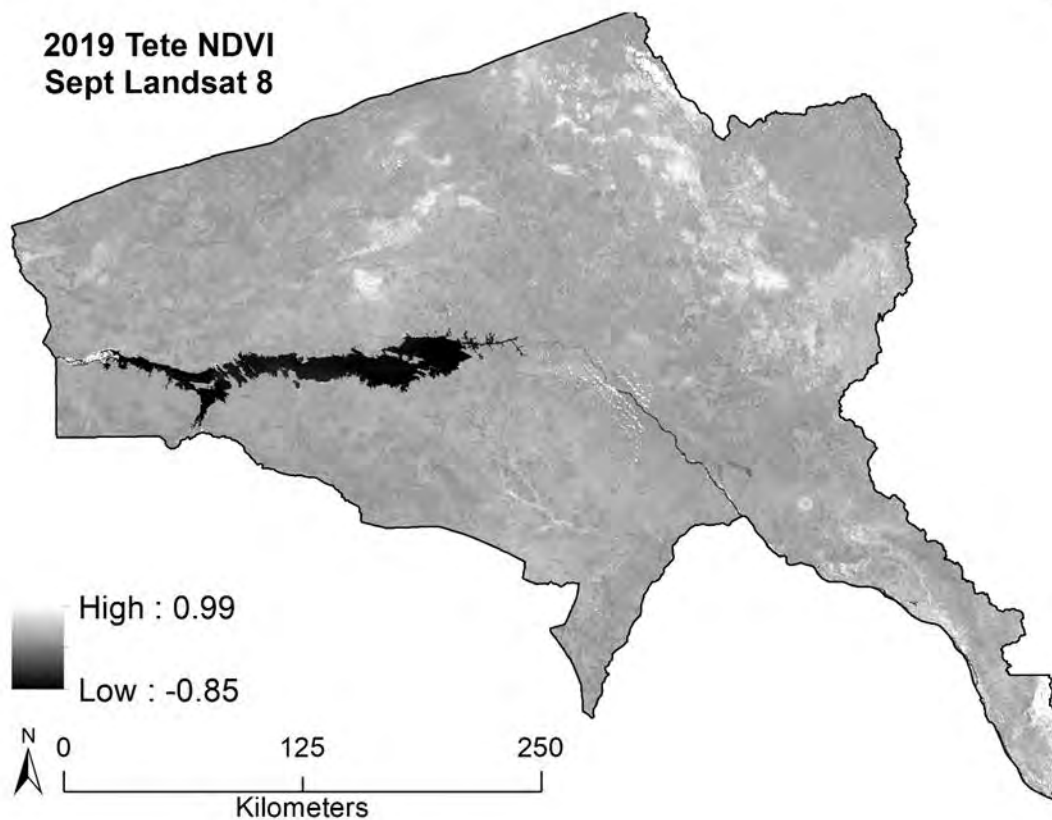
Appendix B.

- Tete 2016 and 2019 NDVI map outputs.
- Niassa 2016 and 2019 NDVI map outputs at the Sentinel-2 MSI satellite imagery extent.

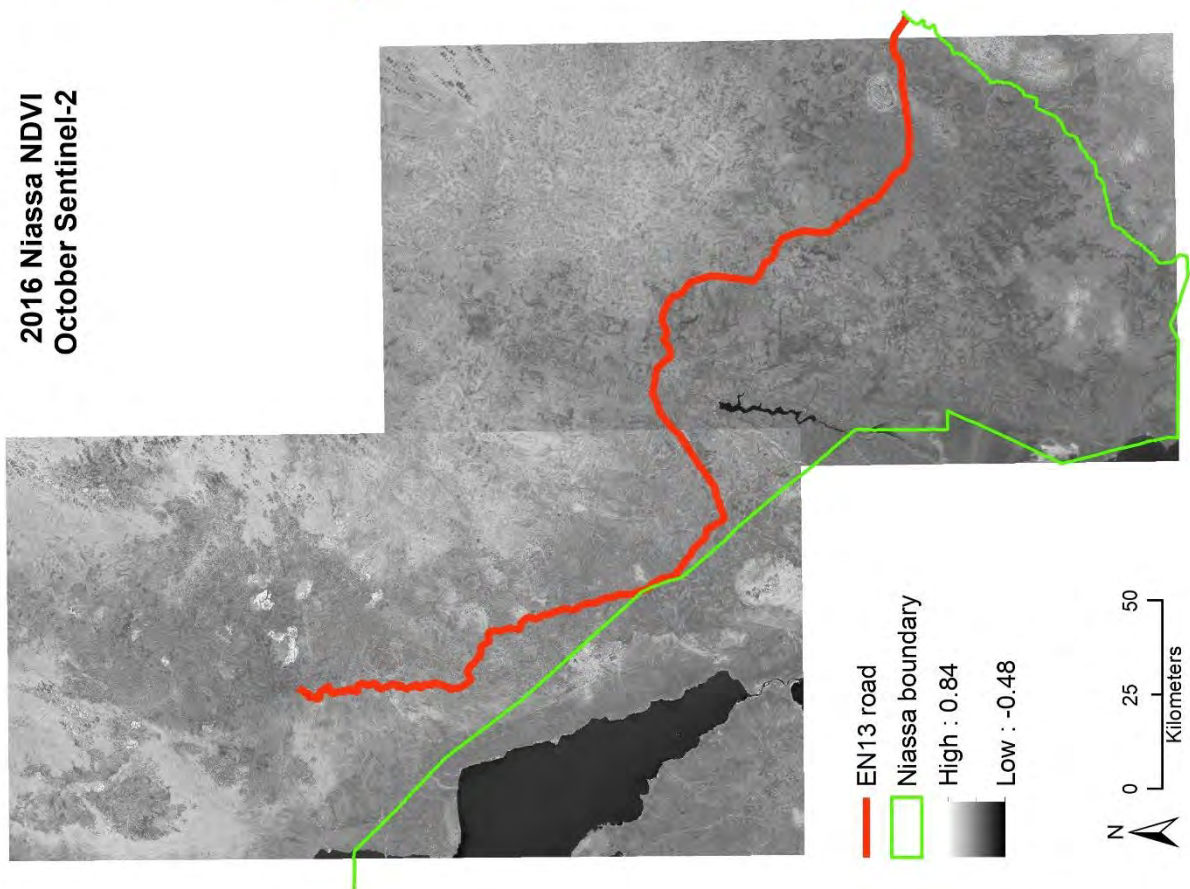
**2016 Tete NDVI
Sept - Oct Landsat 8**



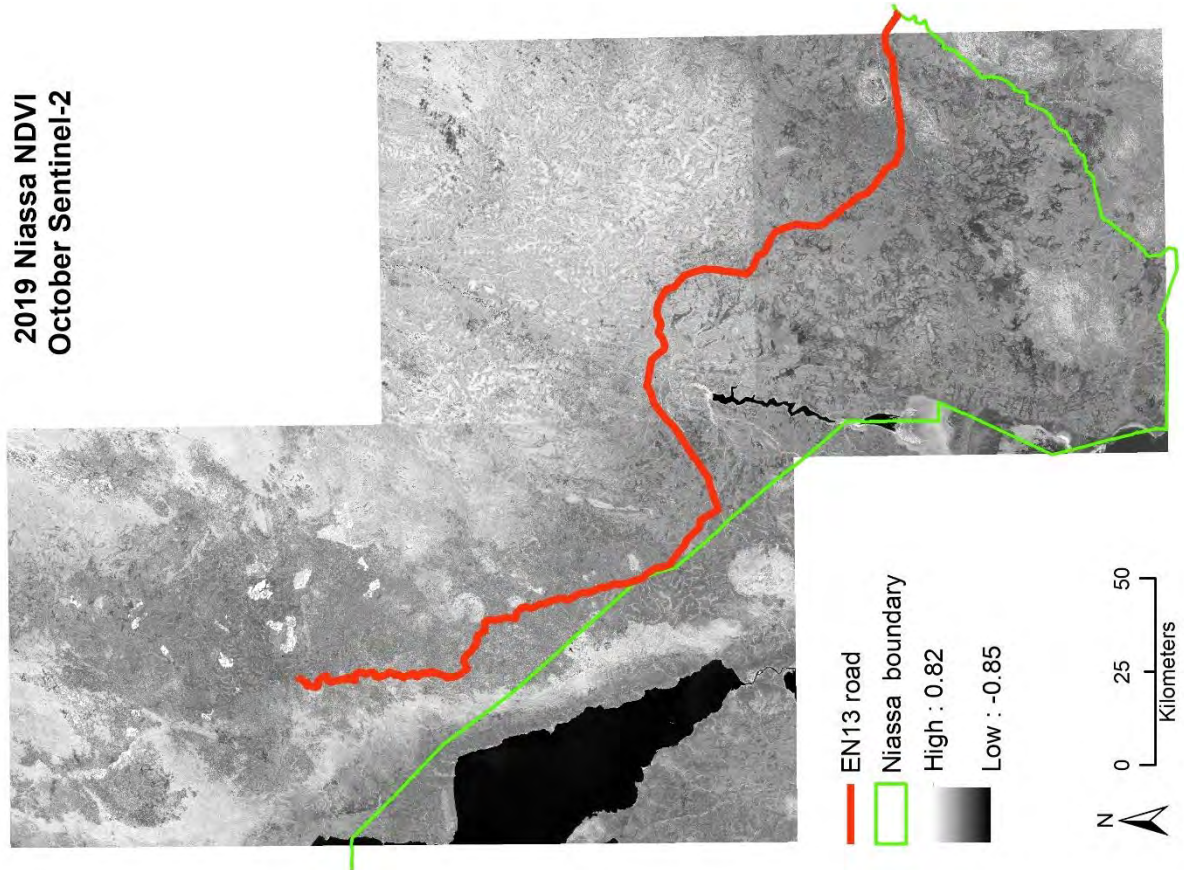
**2019 Tete NDVI
Sept Landsat 8**



2016 Niassa NDVI
October Sentinel-2



2019 Niassa NDVI
October Sentinel-2



Appendix c.

Future research

The ideas and thoughts on future research avenues listed below were generated during the data processing phase of this research. Further discussion is required on the feasibility of these ideas based on the scope and resources available to future projects.

Tete (forest degradation):

- Explore different vegetation indices as measures of forest degradation – e.g. Simple Ratio, Enhanced Vegetation Index, Soil-Adjusted Vegetation Index, Red-Edge-Position Determination, etc.
- Investigate proxy indicators of illegal timber harvesting – e.g. mapping logging roads, skid trails or evidence of logging camps. May provide an estimate of forest condition or point to the potential at-risk areas.
- Apply proximity metrics (i.e. distance buffers) to agriculture activity or infrastructure to identify environmental degradation or map at-risk locations. This is based on the idea that access to an area increases the risk of environmental degradation.
- Targeted hot-spot analysis to identify significant areas of forest degradation and evaluate the impact on the surrounding areas
- Historical investigation on past forest cover dynamics, using the Landsat archive (dates back to 1972).
- Measure site-specific above ground biomass and carbon stock held in the forest. Several modelling approaches are available – e.g. artificial neural network, classification and regression tree algorithms, etc.

Niassa (impact of infrastructure development):

- Increase areas of interest (i.e buffer zones) to assess the wider impact of infrastructure development (i.e. EN13).
- Advanced land cover and land cover change assessment. Potential approaches - image classification, sub-pixel classification, artificial neural network, support vector machine classification, classification and regression tree algorithms, etc.
- Investment in very high spatial resolution imagery (sub-meter) to explore the development of small-scale settlements and roadside activity.
- Explore image textural analysis methods for identifying man-made objects and land cover change (i.e. impervious surfaces) in the 'natural' landscape.
- Investigate spectral indices relating to geological features to identify and track the development of mining activities.

Endnotes

- [illegible]

13 See for example The Rise of Environmental Crime. UNEP and Interpol, 2016. http://unep.org/documents/itw/environmental_crimes.pdf; Mujica, Jaris. Precariedad y Trabajo Forzoso en la Extracción de Madera. ILO and Ministerio de Trabajo y Promoción del Empleo, 2015. http://www.ilo.org/wcmsp5/groups/public/---americas/---ro-lima/documents/publication/wcms_427032.pdf; The Intersection Between Environmental Degradation and Human Trafficking. U.S. Department of State, Jun 2014. <https://2009-2017.state.gov/documents/organization/228266.pdf>; and The Nexus of Illegal Gold Mining and Human Trafficking in Global Supply Chains. Verité, 2016. https://www.verite.org/wp-content/uploads/2016/11/Verite-Report-Illegal_Gold_Mining-2.pdf.

14 For further information on country- and sector- based approaches to understanding trafficking in persons risk, see www.responsiblesourcingtool.org/understandrisk.

15 “Mozambique Country Forest Note.” The World Bank, October 2018. <http://documents.worldbank.org/curated/en/147761541432074205/pdf/131837-WP-P160033-PUBLIC-Country-Forest-Note-Final.pdf>. Accessed 22 May 2020. Note that while the rate of deforestation is high, it has been declining from even higher rates. In the period from 1990 to 2005, average deforestation in Mozambique was over 200,000 hectares per year. See Wertz-Kanounnikoff et al. How is REDD+ Unfolding in Southern Africa’s Dry Forests? A Snapshot from Mozambique. CIFOR, 2011. https://www.cifor.org/publications/pdf_files/infobrief/3402-infobrief.pdf. Accessed 22 May 2020.

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20 Guidelines Concerning Measurement of Forced Labour. 20th International Conference of Labour Statisticians, Department of Statistics, International Labour Organization, Oct 2018. https://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/meetingdocument/wcms_648619.pdf

21 Hard to See, Harder to Count: Survey Guidelines to Estimate Forced Labour of Adults and Children. ILO, 2012. http://ilo.org/global/topics/forced-labour/publications/WCMS_182096/lang--en/index.htm.

22 “CO29- Forced Labour Convention, 1930 (No. 29).” NORMLEX, ILO. https://www.ilo.org/dyn/normlex/en/f?p=NO RMLEXPUB:12100:0::NO::P12100_ILO_CODE:CO29. Accessed 27 Feb 2020.

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24 These indicator lists are not intended to be exhaustive or inflexible. The Guidelines Concerning Measurement of Forced Labour notes that the individually listed indicators are provided inter alia. That is, the indicator list should not be considered exhaustive and leaves open the possibility that additional indicators might create involuntary work or menace of penalty in different contexts. The ILO has also described, in previous guidance documents on conducting forced labor research such as Hard to See, Harder to Count (2012), the importance of creating local definitions for indicators.

25 These indicator lists are not intended to be exhaustive or inflexible. The Guidelines Concerning the measurement of forced labour notes that the individually listed indicators are provided inter alia. That is, the indicator list should not be considered exhaustive and leaves open the possibility that additional indicators might create involuntary work or menace of penalty in different contexts. The International Labour Organization (ILO) has also described, in previous guidance documents on conducting forced labor research such as Hard to see, harder to count

(2012), the importance of creating local definitions for indicators.

26 Hard to See, Harder to Count: Survey Guidelines to Estimate Forced Labour of Adults and Children. ILO, 2012. http://ilo.org/global/topics/forced-labour/publications/WCMS_182096/lang--en/index.htm.

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Disputes can also arise when community land is held collectively rather than by individuals. In these cases, the local community – via local officials – retains land management oversight that would otherwise fall to the national government. In these cases, the potential arises for individual community members to disagree on key matters of land allocation. The 1997 Land Law requires investors seeking to secure land rights to determine via direct community consultation whether land is truly unoccupied or whether a party holds DUAT rights. This prescribed consultation process was intended to facilitate community-level input into land decisions. However, civil society organizations have noted that, in reality, these processes tend to be cursory with little meaningful community participation. See Mozambique.” Land Links. <https://www.land-links.org/country-profile/mozambique/#land>. Accessed 11 Feb 2020.; Republic of Mozambique Country strategic opportunities programme 2018-2022. IFAD, 2018. https://www.ifad.org/documents/38711624/40234873/mozambique_cosop2018-2022.pdf/054028a1-22c7-47cb-b24b-b867856c747a. Accessed 11 Feb 2020 and “Mozambique.” Land Links. <https://www.land-links.org/country-profile/mozambique/#land>. Accessed 11 Feb 2020.

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314 For relevant legislation please see: 1.Conselho de Ministros. 2012. Regulamento sobre o Processo de Reassentamento Resultante de Actividades Económicas Aprovado pelo Decreto No 31/2012 de 8 de agosto, da Assembleia da República. Publicado no Boletim da República No 32, 1.ª Série, Suplemento. Maputo: Imprensa Nacional de Moçambique. 2.Constitution of the Republic of Mozambique, 1990, arts. 11, 40, 59, 68, 82, 84, 86-91,. 3.Land Law, No. 19/97 of 1 October, arts. 3, 9, 10. 4. Constitution of the Republic of Mozambique, 1990, art. 82(2). 5. Land Law, No. 19/97 of 1 October. Article 18(1)(b) on the Termination of the right of land use and benefits states, “1. The right of land use and benefit shall be extinguished.... b) By revocation of the right of land use and benefit for reasons of public interest, preceded by payment of fair indemnification and/or compensation.”

315 This is based on the author’s analysis of land legislation in 2010 when the Resettlement Plan was first created.

316 On August 8 2012 Mozambique’s Council of Ministers announced that it had adopted the Regulation for Resettlement Resulting from Economic Activities. Regulamento sobre o Processo de Reassentamento Resultante de Actividades Económicas]. This decree aims to fill an important gap by providing safeguards for people displaced and resettled by economic activities and development projects. While the decree includes important protections, many significant gaps remain. Key stakeholders were not given an adequate opportunity to participate in its drafting, the decree provides detailed requirements on some elements such as housing, but overlooks vital protections related to land and livelihoods.

317 The Land Law additionally stipulates that the compensation be fair, cover losses and lost profits, and that such payments should precede revocation of land use. It does not specify amount of compensation or what is meant by “fair” compensation.

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