

# **The paradox of sustainability in the extraction of ‘green minerals’ from highly volatile contexts: A case study of graphite mining in Cabo Delgado Province, Mozambique**

---

---

Master thesis International Development Studies 2020-2021

Name: Berj Khassab  
Stud. Nr.: 6983820  
Date: 06/08/2021  
Supervisor: drs. Emilinah Namaganda  
Second reader: prof. dr. Annelies Zoomers  
Word count: 23466



**Universiteit Utrecht**

*Faculty of Geosciences*

## Abstract

The extractive industry is experiencing a revival due to the global sustainability ambitions. As the global society begins to recognise the importance and urgency of the transition to sustainability, companies are becoming increasingly aware of the opportunities that jumping on the sustainability bandwagon offers for their organisation, the society and the environment. Exemplary is the manufacturing industry that is going overboard to develop new, cleaner forms of energy sources to reap the economic benefits of this sustainability transition, as witnessed by the development and use of new technologies such as electric cars. Undeniably driven by the global sustainability ambition and the economic prospect, this development results in the opening of new frontiers of extraction aimed at supplying raw materials for these industries, also known as “green minerals”. Projects in the extractive industry are often accompanied by many negative socio-economic and environmental impacts. Regrettably, the same applies to extraction industries that are driven by the sustainability ambition. As the transition to sustainability is expected to accelerate in the coming years, it is important to understand why such projects, despite their efforts, do not succeed in materialising the intended sustainable development in the implementation of their activities. To this end, the socio-economic and environmental impacts of one of the world's largest green mineral extraction areas, that being the Syrah Resources graphite mine in Mozambique’s Cabo Delgado province, were analysed using a qualitative case study. For this study, sustainable development is approached by taking the moral, political and ecological theoretical concepts of the Sustainable Development Imperatives model as the starting point for the analysis, i.e. how the project relates to ensuring social equality, satisfying human needs and respecting environmental limits. The findings of this thesis indicate that the sustainability paradox in the new extraction frontier of Cabo Delgado can largely be understood by factors including disparity in the interpretations of what adequate public participation entails, lack of government experience, weak enforcement of outdated legislation due to the lack of government means, wrong government priorities, discouraging government incentives, misunderstood community perceptions, misaligned and diverse local development needs among locals, market dependent cycles and deteriorating contextual phenomena.

## Acknowledgements

For many it is no longer a remarkable thing, yet studying in a pandemic has brought many challenges that I have been able to overcome with the help of many people. And while it may sound contradictory, it is surprising how much I have been able to learn in the past academic year within the four quarantine walls of my student room in Utrecht. I recognise that this would not have been possible without the dedicated support and assistance of many people dear to me. I would like to thank them in this way.

First of all, I would like to express my appreciation to Emilinah Namaganda, my supervisor. You have played an important role in fostering my keen interest in this research topic and helped me to comprehend an area of research with which I was previously unfamiliar. Throughout the thesis period, you were always there to answer my questions and steer me in the right direction to complete this work. I am very grateful to you for that and wish you lots of success with your own PhD research!

I am also extremely grateful to Carlos Viriato, who is an extremely ambitious field researcher at Lúrio University, for his contribution to and important role in this research. Carlos conducted a substantial part of the community interviews and additional key informant interviews. Despite the great challenges in Mozambique, he managed to accomplish this to everyone's satisfaction. I am also grateful to him for sharing his contextual insights, which I have often called upon.

Emily, it is thanks to you that I was able to spend long hours on this work, that I could be productive, that I didn't forget to eat, that I got through difficult moments and that I recovered well from Covid-19. I will never forget your support, thank you for your love and encouragement.

This work is dedicated to my dear parents who made my studies possible last year. You made difficult choices so that I could study, I will always be grateful for that.

# Table of Contents

<b>Abstract</b> .....	<b>2</b>
<b>Acknowledgements</b> .....	<b>3</b>
<b>List of tables and figures</b> .....	<b>7</b>
<b>List of abbreviations</b> .....	<b>8</b>
<b>Chapter 1. Introduction</b> .....	<b>9</b>
<i>1.1 Background</i> .....	9
<i>1.2 Scientific and development relevance</i> .....	11
<i>1.3 Outline of thesis</i> .....	11
<b>Chapter 2. Theoretical Framework</b> .....	<b>12</b>
<i>2.1 Theories related to the research topic</i> .....	12
Frontier theory .....	12
Sustainable development imperatives model .....	13
<i>2.2 Literature review</i> .....	15
The emergence of global sustainable development ambitions .....	15
Critique on the concept of sustainable development .....	16
Minerals for the green transition .....	17
Socio-economic and environmental impacts of mining green minerals .....	17
<i>2.3 Knowledge gap</i> .....	18
Research aim and objective .....	19
Research questions .....	19
<i>2.4 Conceptual framework</i> .....	20
<b>Chapter 3. Methodology</b> .....	<b>22</b>
<i>3.1 Research design</i> .....	22
Qualitative research .....	22
Case study .....	22
<i>3.2 Operationalisation</i> .....	23
<i>3.3 Research methods</i> .....	24
Methods of data collection .....	24
Data analysis .....	28
<i>3.4 Reflection on the positionality as researcher</i> .....	29

3.5 <i>Limitations and risks of the research</i> .....	29
<b>Chapter 4. National, regional and local thematic framework</b> .....	<b>31</b>
4.1 <i>Relevant national context</i> .....	31
Brief history Mozambique .....	31
Mozambique's economic transition .....	31
Mining industry in Mozambique .....	32
Extraction legislation Mozambique .....	32
4.2 <i>Relevant regional context</i> .....	33
Poverty .....	33
Armed conflict .....	33
Cyclone .....	33
4.3 <i>Relevant local context</i> .....	34
Locating Project-Affected Communities (PACs) .....	34
Economic displacement of Machambas .....	35
Daily occupation .....	36
Education .....	36
Health .....	37
Commitment to local sustainable practices .....	37
<b>OUTLINE OF RESULTS CHAPTER</b> .....	<b>39</b>
<b>Chapter 5. Sustainability paradox in the green mineral mining project of Syrah Resources</b> .....	<b>40</b>
5.1 <i>Ensuring Social equity</i> .....	41
Ensuring adequate public participation .....	41
Socio-economic implications of economic displacement .....	44
Livelihood restoration .....	47
Grievance mechanism .....	53
5.2 <i>Satisfying human needs</i> .....	55
Local livelihood enhancement .....	55
Local employment .....	57
Socio-economic development as a result of employment .....	57
Consequences of redundancy waves .....	58
5.3 <i>Respecting environmental limits</i> .....	60
Consequences of deforestation and dust .....	60
Floods .....	61
Water pollution .....	61
<b>Chapter 6. Discussion</b> .....	<b>63</b>

<i>Academic implications</i> .....	63
<i>Social implications</i> .....	63
<i>Research limitations</i> .....	64
<b>Chapter 7. Conclusion</b> .....	<b>66</b>
<i>Policy recommendations and further research</i> .....	69
<b>References</b> .....	<b>71</b>
<b>Appendix 1: Interview guide local communities</b> .....	<b>76</b>

## List of tables and figures

### **List of tables**

Table 1. Operationalisation of variables

Table 2. Overview of community interviews

Table 3. Overview of collected documents

Table 4. Educational status village members (Syrah Resources, 2014c)

Table 5. Crop rates as set by the government of Mozambique for 2013 [column A] and 2014 [column B] (Syrah Resources, 2014b, p. 72)

### **List of figures**

Figure 1. Processes and trends underlying the thesis (1) and conceptual framework (2)

Figure 2. Locations of surrounding communities in relation to the project (Syrah Resources, 2016)

Figure 3. Allocated Machambas for economic resettlement (Syrah Resources, 2014b, p. 9)

## List of abbreviations

AoI	Area of Influence
CSO	Civil Society Organisation
CSR	Corporate Social Responsibility
CTV	Centro Terra Viva
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GNI	Gross National Income
IFC	International Finance Corporation
ODA	Official Development Aid
PAC	Projected-affected Community
RAP	Resettlement Action Plan
SD	Sustainable Development
SDG	Sustainable Development Goals
SDI	Sustainable Development Imperatives
SEBS	Socioeconomic Baseline Study
SIA	Social Impact Assessment
TWG	Technical Working Group
UN	United Nations



# Chapter 1. Introduction

## 1.1 Background

Industry has a major impact on climate change; now more than ever. It is their responsible task to look for sustainable solutions. The global sustainability ambition helps to create urgency in taking this responsibility. The business world, too, has come to realise that sustainable business offers great opportunities, for the organisation, for society and for the environment. They feel empowered by the current global push for sustainability, which increasingly supports the development of new technologies that should contribute to a low-carbon future. Many industries are therefore increasingly focusing on the development, use and application of renewable energy sources as an alternative to the use of polluting fossil fuels by taking steps to invest in innovative technologies, tap into new sustainable markets and develop new sustainable products. In this way, the business community is helping to bring the world one step closer to the sustainability transition.

The transition in the automotive industry is a good example in this case. Some countries decide to take far-reaching steps to contain their contribution to climate change as part of the sustainability ambitions. In the automotive industry, Western countries in particular are leading in making new regulations to ban the sale of diesel and petrol cars by the timeframe of 2025-2040 (Wappelhorst, 2020). With the growing interest for low-emission transport options, and in particular electric vehicles, new and more sustainable energy sources for engines are being discovered. A popular low-emission innovation in line with the current global sustainability ambition is engines powered by lithium-ion batteries. Lithium-ion batteries, which are known to power portable electronics such as cell phones and laptops, are also increasingly used in electric cars. Such drastic changes, of which the automotive industry is a good example, create new incentives for the manufacturing industry to continue with the mass production of more sustainable innovations. This trend will only further stimulate the demand for 'green minerals' (Church & Crawford, 2018, p. 5), such as graphite which is a major component of lithium-ion batteries.

However, clean energy technologies are known to be more mineral intensive than current fossil fuel technologies (World Bank, 2020). With global ambitions to shift to low-carbon energy sources through innovations in solar power, wind power and energy storage to move closer to a carbon-free future, a dramatic change in global demand for 'green minerals' will become

visible in the mining industry market (Buchholz, 2018). The role of the mining industry is indispensable in this matter. It is clear that this industry will play a vital role in the current transition to a more sustainable future (Church & Crawford, 2018).

The way green minerals will be sourced will determine to what extent this global pursuit of sustainability will actually lead to sustainable development. In spite of the global sustainability goals, mining these resources presents contradictions in the producing countries. As is known from other natural resource extraction impact reports and case studies (e.g., Al Rawashdeh, Campbell, & Titi, 2016; Kitula, 2006; United Nations Environment Programme, 2000), the mining sector may cause considerable negative socio-economic and environmental impacts. With these studies showing that it is precisely the lack of a coherent commitment of the mining industry to these three dimensions of sustainable development, we can ask ourselves to what extent the global sustainability ambitions that are fuelling the current green minerals trend in the mining industry will not conflict with their own objectives. From other studies it is known that such tensions in sustainable development ambitions on the one hand and unsustainable practices on the other have resulted in sustainability paradoxes before (Hahn, Figge, & Pinkse, 2018).

The global sustainability sector has been pushing the boundaries of mining in search for green minerals, this is particularly visible in the case of graphite mining in the northern province of Cabo Delgado in Mozambique, where the largest graphite mine is located in the Balama district. Apart from being one of the largest graphite reserves in the world, the area is also very unstable and highly volatile due to armed conflicts, devastating natural disasters, widespread poverty and as the rest of the world is currently affected by a pandemic. Considering that such new mining frontiers have not been studied before in terms of how they play out in highly unstable areas that are subject to the intersection of other socio-economic and climate-related events, makes this case a highly relevant one to be studied from a sustainable development perspective. Therefore, this study aims to examine the socio-economic and environmental impacts of an extraction project driven by the global sustainability ambitions, that being the Syrah Resources graphite mine in Mozambique's Cabo Delgado province, with the objective of examining the factors that facilitate the contradictions between what the global sustainability ambition entails and what the project achieves in practice. This leads to the following main research question: *How does the new extraction frontier of graphite mining in the Mozambican province of Cabo Delgado relate to the three imperatives of sustainable development?*

## 1.2 Scientific and development relevance

This thesis is imperative because academically it will make an academic contribution to the debate on the opening of new extraction frontiers driven by sustainability ambitions and the apparent contradictions they. And in practice it will contribute to policy debates regarding the safeguarding of the contributions of such projects to sustainable development nationally and locally.

## 1.3 Outline of thesis

In order to further clarify the research question, the research will first be embedded in the theories of the sustainable development imperatives model and the frontier theory in the following chapter. In the same chapter, the most important research concepts are discussed in the literature review to then logically arrive at the knowledge gap on which the research purpose is based. Chapter 3 explains and justifies the methodological choices of this study. Chapter 4 then provides a brief introduction to the relevant national, regional and local processes and context. Based on this understanding of the context, the findings - structured according to the concepts of sustainable development - are then presented in Chapter 5. Chapter 6 discusses the social and theoretical implications of the findings and the limitations of the study. Finally, the research is concluded in chapter 7 and the lessons learned from this research are shared in order to make some recommendations.

## Chapter 2. Theoretical Framework

In this chapter, the theories and concepts relevant to this study are introduced. The main theories used for this study are the frontier theory and the sustainable development imperatives model (section 2.1). In order to determine the position of this study in contemporary theoretical debates, a literature review is also conducted in this chapter, which addresses the main concepts of the research (section 2.2). This literature discussion enables us to arrive at a knowledge gap on which the research is subsequently based. From the knowledge gap, the aim and objective of the study follow, after which the research questions are presented (section 2.3). Finally, an elaboration of the conceptual framework explains how the main concepts and theories of this research will be used in this study (section 2.4).

### 2.1 Theories related to the research topic

#### *Frontier theory*

The concept of frontiers, other than territorial frontiers, has its origins in Frederick Jackson Turner's famous work on the "The Significance of the Frontier in American History" (Turner, 1893). His main thesis, the "frontier thesis", was that the colonization of European and English migrants of the free land of the North American Great West was the greatest determinant of the country's history and national development. This work eventually became one of the most important historical works of the United States with the concept of the frontier "the outer edge of the wave—the meeting point between savagery and civilization" (Turner, 1893) as the most important contribution to historical thought. Current scholarly views and works on the concept of the frontier can therefore not be seen in isolation from this specific historical context of the American West in the 19th century, as described by Turner (Geiger, 2009, p. 11). However, more contemporary schools of the frontier theory have moved away from this restrictive and exclusive historical context of the American condition, often referred to as American exceptionalism.

The main criticism of Turner's notion of frontiers is that it exaggerated American exceptionalism and made a broader comparison and analysis of the concept impossible. As such, Turner is blamed for squandering the potential explanatory power that the concept can have in relation to the comparative study of other frontiers in the world by taking this restrictive view of the concept (Geiger, 2009, p. 18). In order to counter this shortcoming of the concept, academics have opened up the concept of the frontier to a wider use, so that it also comprehends

an explanation of frontiers that appear in other regions of the world. In this regard frontiers, in its broadest sense, can be understood as “an area remote from political centers which holds strategic significance or economic potentials for human exploitation, and is contested by social formations of unequal power” (Geiger, 2009, p. 219). These rather remote areas are, despite the presence and attraction of natural resources and national interests in territorial control, characterised by their relatively low government presence and a considerable autonomous indigenous population (Geiger, 2009, p. 28).

The reconstruction of the concept by making it capable of explaining other than the American Great West context expanded its analytical perspective and implied the identification of other types of frontiers. The differences between the types of borders depend on the specific enticements that the specific borders offer to those who wish to conquer them (Geiger, 2009, p. 32). For example, Turner himself identified explanations as to why different classes of invaders left for the West based on what they intended to make of the frontier: “The exploitation of the beasts took hunter and trader to the west, the exploitation of the grasses took the rancher west, and the exploitation of the virgin soil of the river valleys and prairies attracted the farmer” (Turner, 1893). A frontier type that is relevant to areas where the context involves the exploitation of natural resource is the “frontier of extraction” (Friedmann, 1996). According to Friedmann, borders of extraction arise when the main reason for invading a sparsely populated territory is not to establish colonies of settlers, but to search for and extract natural resources.

### *Sustainable development imperatives model*

Earlier it has been indicated that literature on sustainability generally suggest that three elements, the social, the economic and the environmental are at the core of the concept of sustainable development. These dimensions are also reflected in the resolution "Transforming our world: the 2030 Agenda for Sustainable Development" that led to the SDGs and was adopted by the General Assembly of the United Nations. This agenda states that the three dimensions must be in balance with each other to come to sustainable development. Most theoretical models that aim to achieve sustainable development, such as the popular three-pillar model are based on this idea (Holden, Linnerud, & Banister, 2017). Erling Holden, Kristin Linnerud and David Banister, which are the authors of the sustainable development imperatives (SDI) model, build on the existing three-dimensional models of the concept of sustainable development but take a completely different approach. In their article, the authors describe their

threefold critique on existing ideas regarding the concept of sustainable development by arguing that the Sustainable Development Goals and related models 1) have ultimately become vague, weak and meaningless due to the lack of prioritisation of goals, 2) suffer from a lack of moral constraints 3) lack the necessary theoretical foundation.

The first problem they point out is that the lack of prioritisation of the primary goals of sustainable development means that the world is settling for achieving secondary goals while at the same time failing to achieve the primary goals of sustainable development. The second problem the authors have with the mainstream sustainable development concept is its assumption that the three dimensions must be balanced instead of recognising that there are also environmental limits to development that call for moral constraints on human behaviour such as unrestrained economic activity. Finally, the authors' third criticism concerns the fact that knowledge about the sustainable development goals has a poor theoretical foundation. Instead, the authors propose an alternative model of sustainable development based on three imperatives founded in moral, political and ecological theoretical works.

The model includes the following three moral imperatives:

1. Satisfying human needs (based on the capability approach by A. Sen)
2. Ensuring social equity (based on the two principles of justice by John Rawls)
3. Respecting environmental limits (based on the planetary boundary approach by Steffen et al.)

The authors argue that sustainable development is not achieved by balancing the three pillars, but by socially desirable policies or practices that do not conflict with the three imperatives of sustainable development. Most importantly, they argue, that the constraints of policies and practices are non-negotiable, as they are all of equal importance. This model avoids "the possibility of trespassing one constraint because of overperformance in another" (Holden et al., 2017 p. 216). An example of violating sustainability constraints is unbridled economic growth that leads to an increase in greenhouse gas emissions and worsens social equality by contributing to income and wealth inequality.

The first imperative, satisfying human needs, goes beyond "seeing people's needs only in terms of intermediate needs" (Holden et al., 2017 p. 217) and has its theoretical foundation in Amartya Sen's (2009) capability approach. The main idea of the capability approach is to guide policies

and practices so that they aim to ensure that people have the capacity to live the kind of life they have reason to value, and if necessary to remove obstacles that hinder people's ability to fulfil that aspiration. The second imperative, ensuring social equity, is based on the philosophical work of John Rawls 'a theory of justice' (1971). In his work, Rawls identified a thought experiment to arrive at a social contract in which justice is guaranteed. In short, the thought experiment would lead to two principles, the liberty principle and the difference principle. On the one hand, the liberty principle ensures that people enjoy basic freedoms to the extent that it does not interfere with the freedom of others. Holden et al. elaborates that the freedom principle refers to political freedom, which in terms of social justice and sustainable development refers to participation and giving a platform to the "low voices" (p. 219). On the other hand, the principle of differentiation guarantees that every person has an equal chance of prosperity. In this case, the translation of this principle refers to a call for a fair distribution of income and wealth (p. 219). The third imperative, respecting environmental limits, draws on the efforts of Rockström et al. (2009) and Steffen et al. (2015) about the "planetary boundary approach". In their work, the researchers identified nine planetary boundaries and quantified for 7 of the 9 processes a boundary level that must be circumvented to prevent irreversible global environmental change. The nine planetary boundaries are climate change (planetary boundary exceeded), rate of biodiversity loss (exceeded), global phosphorus and nitrogen cycles (exceeded), ocean acidification, land system change (exceeded), global freshwater use, stratospheric ozone depletion, aerosol loading (not yet quantified), chemical pollution (not yet quantified).

## 2.2 Literature review

### *The emergence of global sustainable development ambitions*

In his book Jeffrey Sachs (2015) describes that sustainable development can be understood as a normative outlook on the world, meaning that it recommends a set of goals to which the world should aspire. The Sustainable Development Goals (SDGs) were founded on a global aspiration to end fundamental problems related to extreme poverty, inequality, injustice, education and climate change. To achieve this ambition, international agreements were signed in 2015 by the 193 member states of the United Nations in the form of 17 goals. To make the goals more decisive, a number of indicators (targets) were added to each goal later so that progress could be monitored. Niklasson (2019) argues that the SDGs are in many ways an elaboration of the previous Millennium Development Goals, which were in place from 2000 to 2015. What,

according to him, distinguishes the SDGs from the MDGs is that there are now more goals agreed upon, more countries participating in the agreement, and that countries have participated more in the drafting of the goals.

In order to better understand the origins of the SDGs, it is important to consider two things that characterised the time preceding this global agreement. On the one hand, the world had seen the global poverty rate drop almost to half its rate of 1990. This marked an enormous step forward in the goal of poverty reduction (World Bank, 2019). On the other hand, the world was increasingly facing challenges related to environmental degradation and climate change (Rockström et al., 2009). Given that these challenges concern and affect all countries and require a global approach, it was only logical that the SDGs were a global creation that also invoked a global commitment. Jeffrey Sachs (2015) asserts that these two concerns, poverty reduction and environmental degradation, are the core issues of what brought forward the notion of sustainable development. Although the concept of sustainable development in literature is widely considered to be multi-dimensional and can be defined in different ways, most studies generally assume that the concept includes at least the following three elements: the social, the economic and the environmental (Derlukiewicz, 2014; Hanss & Böhm, 2011; Krstić, Ilić, & Acramović, 2018; Rogers, Jalal, & Boyd, 2008; Sachs, 2015).

### *Critique on the concept of sustainable development*

According to the critique of Steven Bernstein (2001, p. 29), there are a number of things to note about this emergence of the concept of sustainable development. First of all, the concept is supposedly conceived as a kind of middle ground - a consensus - for a conflict between the global North and the global South. The global North has been accused of focusing too much on counteracting environmental problems, while the global South would have preferred to put more emphasis on poverty reduction. What has made this discussion so difficult is the fact that a one-sided focus on countering environmental problems could impose restrictions on unlimited economic development as previously enjoyed by the Global North. Even though that the concept of sustainable development aims to unite the two different world visions under a common goal, critics such as Bernstein blame the idea for being a political compromise that overshadows the need for fundamental debate. Finally, another critic, Peter Rogers, argues that the lack of clarity about the real meaning and interpretation of sustainable development is a



sign of a successful political compromise because it leaves room for different parties to make their own interpretation (Rogers et al., 2008).

### *Minerals for the green transition*

It is previously emphasised that green minerals will play a vital role in the global transition to sustainability, as they are an essential component in the production of sustainable innovations. With the global increase in sustainable innovations, the prospects of this green minerals market are unprecedented. Peter Buchholz (2018) specifically looked at the demand, supply and price trends in the extraction of green minerals that play an important role in the transition to a more sustainable world. These minerals are part of the renewable energy market, a market of green technologies such as wind energy, solar energy and energy storage. In the longer term, these low-carbon technologies are set to replace the current energy system, which consists of polluting fossil and atomic fuels. According to Buchholz, the world is already well on its way towards this transition. In 2018, 173 countries have formulated policy strategies to develop a renewable energy market and global financial investments in the renewable energy market grew from USD 73 billion to USD 286 billion per year between 2005 and 2015. With the renewable energy market experiencing massive growth, it is expected to scale up demand for the green minerals associated with the green transition by an order of magnitude (Buchholz, 2018). World Bank estimates predict that global demand for green energy technologies will increase the production of "minerals for climate action", such as graphite, lithium and cobalt, by nearly 500% by 2050 compared to 2018 levels (World Bank, n.d.-a). The extraction of minerals has never been an uncontroversial activity; since the beginning of this industry, it has had an impact on people, the economy and the environment. Unfortunately, the same applies to the extraction of green minerals as will be explained in the next section.

### *Socio-economic and environmental impacts of mining green minerals*

Work in the mining sector has always been relatively hazardous compared to other industrial sectors for various reasons. According to Rankin (2011) the danger is inherent to the nature and size of the industry, the method of production, the type of product and the waste it generates. In developing countries in particular, where national safety jurisdiction is often lacking, tens of thousands of accidents occur each year, resulting in thousands of deaths (Rankin, 2011). Unfortunately, extractive industries that rely on the extraction of green minerals in light of the global sustainability ambition do not escape this fate either. Take for example the extraction of

lithium, a green mineral used to produce lithium-ion batteries that power low-carbon vehicles, in the Chilean Atacama region. According to (Romero, 2012), the extraction of lithium and other minerals aggravates the already existing water scarcity in the region due to depletion and pollution. Because the mine is adjacent to a nature conservation area, the extraction of lithium not only causes the degradation of Atacama's ecosystem, but also the forced migration of local residents due to water scarcity and water pollution (Romero, 2012). Regarding the economic impact of the extractive industry on resource-rich countries, it becomes clear that these countries often do not benefit from the mining industry because the profits are collected by the investing parties from developed countries and are often not reinvested in the country that has provided these profits (Rankin, 2011, p. 179).

In order to address the socio-economic and environmental shortcomings and to respond to criticism of their performance, more and more extractive companies embraced Corporate Social Responsibility (CSR) strategies in the early 1980s (Hilson, 2012). Although there is debate about the precise definition of CSR, the following definition is a good one: "the notion that corporations have an obligation to constituent groups in society other than stockholders and beyond that prescribed by law or union contract"(Jones, 1980, pp. 59–60). The actual contribution of CSR strategies of extractive companies in developing countries is disputed. It is argued that such strategies would allow companies to use CSR rhetoric to reap the benefits of so-called reforms without actually making major and significant changes to policies and implementation – this process is also known as greenwashing (Utting, 2005, p. 383).

### 2.3 Knowledge gap

The extractive industry is experiencing a resurgence with the increasing global demand for "green" resources that serve as raw materials for the development of clean and low-emission technologies. Undeniably driven by the global sustainability ambition, this transition is resulting in the opening of new frontiers of extraction aimed at the exploitation of green minerals as demonstrated by Syrah Resources' graphite mining project in Mozambique's Cabo Delgado province. Overall, the literature shows that the extraction industry creates significant negative socio-economic and environmental impacts. As the sustainability ambition is inextricably linked to the extractive industry as the latter plays a vital role in the transition towards a sustainable future, the way this new extraction frontier operates will determine the extent to which this global pursuit of sustainability will actually lead to sustainable

development. It is becoming more prevalent that global awareness of the mining industry's impacts on socio-economic and natural environments and of its essential role in generating sustainable development is influencing public opinion and policy. As evidenced by the increase in the adoption of CSR strategies and use of international performance standards by the extractive industry since the 1980s. Any attempts by the industry to obstruct this process and the changes in implementation that it entails will therefore only lead to counterproductive effects in the long run (Rankin, 2011, p. 178). And yet other extraction frontiers opened by the sustainability ambition have already proved to be unsuccessful in achieving the desired sustainable development as evidenced by the literature. This is despite the fact that, in light of the global sustainability ambition, such projects should not only contribute by providing green minerals for the production of clean technologies, but also contribute to national and local development in the country where these resources are sourced. The fact that this sustainable development is not taking place in the source countries is a worrying development that contrasts with what the transition to sustainability is all about, and therefore deserves further consideration and attention in terms of the factors that foster contradictions in sustainability and obstacles to development.

### *Research aim and objective*

This thesis aims to analyse the socio-economic and environmental impacts of new mining frontiers driven by global sustainability ambitions. To this end, the case study of green mineral extraction in the Mozambican province of Cabo Delgado, where the company Syrah Resources extracts graphite, is used. To assess the impacts that this project generates, the sustainable development imperatives model will be used. Assessing these impacts by using the SDI model does not imply that the main purpose of this thesis is to measure the impacts of the extractive industry; these effects have already been extensively studied as evidenced by the literature review. Rather, the objective of this thesis is to examine the factors that facilitate the contradictions between what the global sustainability ambition entails and what it achieves in practice, as will be shown by the analysis of the case study.

### *Research questions*

Based on the theoretical framework, knowledge gap and research aim as outlined in the previous sections, this thesis will address the following main research question:

*How does the new extraction frontier of graphite mining in the Mozambican province of Cabo Delgado relate to the three imperatives of sustainable development?*

The research design of this thesis employs a case study, therefore the general concept of "green minerals" extraction is replaced by a specific green mineral, namely graphite mining in the context of Syrah Resources' project in Cabo Delgado, Mozambique. Since this study first aims to assess - using the sustainable development imperatives model - the socio-economic and environmental impacts of graphite mining in order to then identify the factors that trigger these sustainability contradictions, the main research question can be subdivided into three sub-questions:

- 1. How does graphite mining contribute to ensuring social equity in Cabo Delgado, Mozambique?*
- 2. How does graphite mining contribute to satisfying human needs in Cabo Delgado, Mozambique?*
- 3. How does graphite mining contribute to respecting environmental limits in Cabo Delgado, Mozambique?*

## 2.4 Conceptual framework

In this section, I give a schematic representation (see figure 1) of the main processes and concepts that led to the formulation of this research as discussed in the theoretical framework and the literature review. It is important to gain an informed understanding of the processes and trends that underlie the thesis (section 1 in the conceptual framework figure), as their relationship guides and influences (indicated by arrows) relevant concepts, practices and phenomena of this thesis (2). We have argued that the global sustainability ambition (A) and the associated innovative technologies to achieve the sustainability transition are revitalising the extractive industry (B) by boosting the demand for green minerals. In the quest for green minerals, the boundaries of the extractive industry are being pushed to new limits, resulting in the opening of new frontiers of extraction and the expansion of the extractive industry towards green mineral mining (C). The market demand for green minerals that is evidently driven by the global push for sustainability and the associated sustainable initiatives logically implies that the extraction of green minerals must take place in line with sustainable practices. Section 2 of the conceptual framework shows how the concepts of the sustainable development imperatives

model (D, E & F) relate to each other and to the case study. The concepts central to this research have been placed at the ends of a triangle to symbolise their interdependence, non-negotiable nature and equal importance, as explained in the theoretical section of the SDI model. Only when the conditions of the model and the concepts are fulfilled will sustainable development take place. Besides representing the imperatives of sustainable development, these concepts also help achieve the research aim of this thesis: *to assess the socio-economic and environmental impacts of graphite mining to see how the project relates to sustainable development*. The analysis of the findings from this assessment will ultimately help to identify factors that hamper sustainable development.

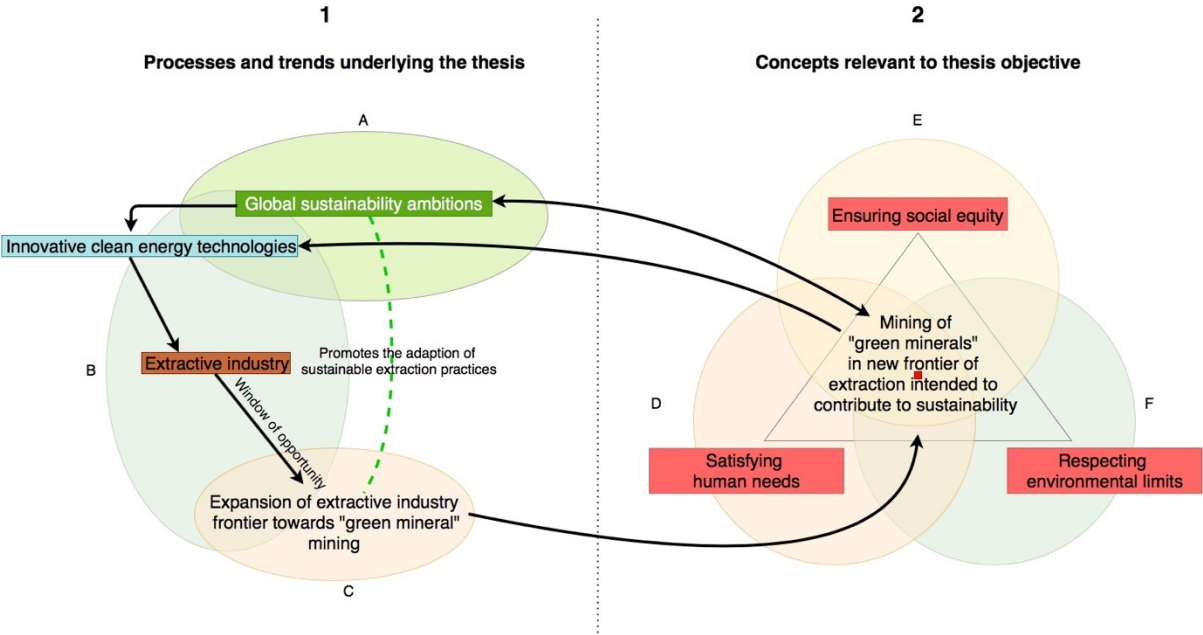


Figure 1. Processes and trends underlying the thesis (1) and conceptual framework (2)

## Chapter 3. Methodology

In this methodology chapter, the choice of the research design used, namely the qualitative case study design, was first explained (section 3.1). Then, the main research concepts were operationalised by situating them in the context of the case study (section 3.2). Next, the research methods applied are outlined by describing the data collection methods used and by accounting for the data analysis (section 3.3). In the last two sections of this chapter, a reflection on the role and position of the researcher is provided (section 3.4) and the limitations and risks of the research are discussed (section 3.5).

### 3.1 Research design

#### *Qualitative research*

The epistemological position of this thesis is interpretivist in nature as it seeks to understand the perceptions and experiences of people affected by the impacts of green mineral extraction. To achieve this, a qualitative research design was adopted because this is the most appropriate way to explore and understand the meanings individuals or groups ascribe to a social or phenomenological problem and because it enables the researcher to interpret those meanings (Creswell, 2014, p. 65). Qualitative research is particularly useful when sensitive and complex issues and contexts need to be studied in depth which cannot be easily translated into numerical outcomes or disentangled by quantitative research (Hennink, Hutter, & Bailey, 2020). Since the case study used for this thesis is located in a very sensitive context due to socio-economic and environmental events in the region and due to the fact that the case study project also involves personal impacts, it is useful to conduct a qualitative research to understand how to interpret these processes in a nuanced and detailed way. The following section provides more information on the case study used.

#### *Case study*

In the theoretical framework chapter, the link between sustainability and the opening of new frontiers of extraction is explained. This process is relatively new as evidenced by the establishment of the Australian green mineral mining company Syrah Resources in the northern Mozambique province of Cabo Delgado in the Balama district, one of the world's largest graphite mines. A case study is an appropriate research design for studies involving detailed and intensive analysis of a single case (Bryman, 2016, p. 66). As this thesis aims to analyse such new frontiers of extraction in-depth, and in particular the distinctive context of the Cabo

Delgado case, the use of a case study is an appropriate design for this purpose. Chapter 4 gives a more complete description of the case studied.

### 3.2 Operationalisation

In the sustainable development imperatives conceptual framework of chapter two, three main concepts emerge that need to be operationalised so that they become useful for the research. The operationalisation is mainly based on the recommendations proposed by Holden et al. regarding indicators and threshold that should be met to come to sustainable development. However, since qualitative research methods are used, the fixed nature of the indicators of the concepts was abandoned in order to arrive at what Blumer (1954) calls 'sensitizing concepts'; a general sense of reference and guidance to look for empirical phenomena in the social sciences. For that purpose, it is important to situate the operationalisation of these concepts in the context of the Mozambican province of Cabo Delgado to be able to study the case properly. Table 1 lists the most important concepts with contextual operationalisation examples of how to recognise them in the case study context. The concept of ensuring social equity refers to the extent to which all stakeholders are involved in the project and have an appropriate voice in key decision-making processes as well as in issues of fair distribution of wealth, risks and responsibilities. In the context of the chosen case study, it refers – but not exclusively – to the public participation meetings between the company and the affected local communities, the extent to which these communities have a say in key processes and can raise grievances, the socio-economic impacts local communities experience, the bearing of responsibility for the impacts caused and their reasonableness with regard to compensation and mitigating measures. The concept of satisfying human needs refers not only to understanding people's immediate needs but also to understanding the needs they have in order to live the life they aspire to and to remove obstacles that might hinder this. In the context of the case study, this means the extent to which the company contributes to maintaining or improving the livelihoods of the inhabitants of the local communities and the extent to which the company contributes to local socio-economic development. The concept of respecting environmental limits is about preventing environmental impacts that cause irreversible global environmental change. For this study, environmental impacts are limited to the local context of the province of Cabo Delgado and, in particular, to those impacts that adversely affect the local community in the immediate vicinity of the company.

Concepts	Contextual operationalisation	Examples
Ensuring social equity	Adequacy public participation, fair distribution of wealth, risks and responsibilities, socio-economic implications of presence mine, compensation.	Perspectives of key informants on adequacy participation in public meetings, the addressing of injustice, material/financial compensation, compensation(s) rates, socio-economic impacts of economic displacement.
Satisfying human needs	Satisfying direct and indirect needs through support and development programmes, local employment possibilities, improving livelihoods and livelihood restoration.	Commitments to local sustainable development through programmes and policies, local employment policies, infrastructure development.
Respecting environmental limits	Environmental impacts resulting from the operation of the mine.	Local environmental impacts such as contaminated water, generation of dust and other pollutants, deforestation.

Table 1. Operationalisation of variables

### 3.3 Research methods

#### *Methods of data collection*

Three methods of data collection were used: 1) interviews with affected communities 2) additional interviews with other stakeholders and key informants 3) secondary data collection.

#### Interviews affected communities

Given that in-depth interviews are suitable for collecting information about people's personal experiences of specific issues or topics (Hennink et al., 2020) and as this fits well with the focus of this research, the data from 98 semi-structured in-depth interviews with residents and local leaders from different local communities were used as the main source of information for this thesis. The data consists of interviews with 22 women and 76 men, consisting mainly of local residents and about one local leader per community. For the distribution per community see table 2. These interviews were used to analyse the community residents' experiences of relevant local phenomena and the socio-economic and environmental impacts associated with the mining company.



<b>Affected community</b>	<b>Interviewees (98) and gender</b>	<b>Further details</b>
Nquide	11 (2F, 9M)	Identified as a Project-Affected Community (PAC) under the Syrah Resources Resettlement Action Plan
Ntete	21 (5F, 16M)	PAC
Mualia (Also known as Maputo)	10 (3F, 7M)	PAC
Pirira	12 (4F, 8M)	PAC
Balama	10 (1F, 9M)	PAC
7 de Setembro	2 (2M)	Near Syrah's water supply dam
Nacole	11 (11M)	Hosts resettled farms
Nanhupo	10 (4F, 6M)	
Marica	11 (3F, 8M)	Hosts resettled farms

Table 2. Overview of community interviews

#### Interviews stakeholders and key informants

Additional semi-structured in-depth interviews were conducted with stakeholders and key informants to get a better picture of the project's operations and functioning, local dynamics and phenomena and government involvement.

#### Civil society organisation

A key stakeholder in the project is the civil society organisation (CSO) Centro Terra Viva (CTV), which has been involved from the start of the implementation process of the Syrah Resources project in public participation meetings, community consultations and the environmental licensing process, among other activities. The organisation aims to contribute to sustainable development by ensuring the participation of civil society in environmental education and information through environmental advocacy, as well as the proper adoption and implementation of environmental legislation through good environmental governance promotion (Centro Terra Viva, 2020). The information from the interview with this organisation has been of value as it provided insight into their perspective and experiences on

the operations and impacts of Syrah Resources. In particular, valuable information about their perspective on Syrah's public participation activities, contribution to local sustainable development and environmental compliance helps to answer the research questions of this thesis.

#### Former social officer Syrah Resources

The mining company's perspective is represented by an interview with the former social official, who has been made anonymous for privacy reasons. The former social official in question played an important role in the socio-economic and environmental assessment, implementation and resettlement processes of the project. Besides providing insight into these processes, this interview also allows the study to compare the findings of the community interviews with the perspective of the company. Furthermore, it also provides the opportunity to gain insight into why and how certain socio-economic and environmental impacts occur. This helps to nuance and interpret the findings of the local communities where necessary.

#### Government official

The last key stakeholder in the series of additional interviews is the interview with the government official from the Mineral Resources Department of the Mozambican provincial directorate in Cabo Delgado. The interview with the government official provides insight into the government's involvement in relation to the project in particular and to large-scale investment projects in the province in general. In addition, it provides insight into the functioning of the current legislation relating to mining. In addition, it provides insight into the Mozambican government's ability to manage such projects to minimise impacts and to ensure that they contribute to local sustainable development. Finally, it provides government information on relevant events in the region.

#### Secondary data collection

In addition, collected documents, reports and policy papers, also known as "materials that have not been produced specifically for the purpose of social research" (Bryman, 2016, p. 543), are part of the data collection of this research. These documents were studied to understand and analyse the key processes surrounding the company's implementation, environmental licensing and resettlement. In particular, examining these documents is relevant to this study because they "represent data to which the participants (the company) have given attention" (Creswell, 2014). Thus, based on the document analysis, it can be identified what the company considers

important or pays attention to in terms of their operations or contribution to sustainability. This includes their perception of how they think they can best deal with the social, economic and environmental consequences of their activities, and what measures they believe are important in terms of their social contribution and corporate responsibility. Table 3 summarises the data collected for the analysis in terms of documents, reports and policies.

<b>Name</b>	<b>Document type</b>	<b>Purpose</b>
Resettlement Action Plan (RAP)	Assessment report and plan	Mitigation of project induced economic displacement impacts
Social Impact Assessment (SIA)	Assessment report	Assessment of project induced socio-economic impacts
Environment policy	Policy document	Implementation of responsible environmental management and to achieve 'license to operate'
Health and Safety policy	Policy document	Preventing inherent risks associated with project operations
Social policy	Policy document	Achieve open and productive relationships with communities and key stakeholders
Sustainable Development Policy	Policy document	To contribute to sustainable development and to achieve 'social license to operate'
Quarterly Sustainability Updates	Report	To give updates on the latest sustainability contributions from Syrah Resources
Local Employment Plan	Policy	Encouraging the use of local employment

Public Consultation Report	Report	Description of the Public Participation Process undertaken
----------------------------	--------	--

Table 3. Overview of collected documents

### *Data analysis*

The primary research data, consisting of 98 interviews previously conducted with local communities as part of a PhD, was translated from Portuguese into English for the purpose of analysis. After the translation process, the interviews were anonymised and reorganised accordingly using labels with interview numbers and community names, for example (Interviewee 7, Ntete). The translated interviews were then reviewed to identify translation errors and to note any remarkable first impressions. Once ready for analysis, the interviews were then coded inductively to ensure that the emic perspective of the participants was captured. The way codes were created was based on saturation, i.e. the moment when no new codes emerge from the data. Thereafter, a mix of inductive and deductive approaches was applied, inductively to organise examined experiences thematically and deductively to organise perceived impacts according to the social, economic and environmental dimensions of sustainable development. For the coding process, the computer software NVivo 12 was used to assist in searching, analysing and organising information. For the additional interviews, semi-structured interview guides were created based on a deductive process to ground it in the relevant concepts and research questions. These interviews were only set up after the community data had been largely analysed, in order to identify what information was still needed for the research. The interviews of the additional participants were partly conducted by the researcher, this applies to the interview with the former social officer of Syrah Resources, and partly by a fellow researcher of the Lúrio University in Pemba, Mozambique due to practical limitations, this applies to the CTV and government interview. These interviews were then transcribed and translated into English and went through the same coding procedure as the community interviews. The documents of the secondary data collection were studied and analysed as a reference to understand the key processes and operations of the company. The information in these documents was often juxtaposed with the findings from the community interviews to make comparisons, interpret experiences and also served as a way to triangulate research findings, contributing to the credibility of the research study (Bryman, 2016, p. 392).

### 3.4 Reflection on the positionality as researcher

"Qualitative research is interpretive research" (Creswell, 2014) in which the researcher is involved in the experiences of the participants in a prolonged and intimate manner. This involvement may have implications for the outcomes of the research through the researcher's values, biases and personal background (Bryman, p. 715). Therefore, it is important for the researcher to recognise and acknowledge this and, through reflection, to consider how this might affect the research, also known as reflexivity (Creswell, 2014). My initial academic background is in political science and during my academic career I have learned how multinational corporations have become increasingly powerful in the course of the years of globalisation and how they use their power to influence policy processes to their advantage. Furthermore, my personal background as a 26-year-old man with a Syrian and Dutch nationality who grew up in a refugee family made me familiar with the challenges that displacement can bring. These facts are both evidence of my interest in the focus of this research and of my possibly biased view with regard to the project. Although my personal background had practically no influence on the data collection itself, as the community data had already been collected by other researchers, that does not address the possible role it could have on the analysis of the data collected. I am certainly aware that I can use this experiences and knowledge as an asset in this research as it allows me to better contextualise and interpret the displacement experiences of local communities, it is also good to reflect on how to prevent my personal views from influencing the research findings. There are two ways to prevent my preconceptions from influencing the research. Firstly, by considering the participant's experiences as a guide during the assessment and secondly, by using the operationalisation of the concepts related to the model of the sustainable development imperatives in the assessment of the company's impacts and commitments.

### 3.5 Limitations and risks of the research

An important part of this research focuses on the assessment of the socio-economic and environmental impacts of the project on local communities through the mapping of their experiences and perceptions. Without making value judgements about their experiences, it is important to realise that these host communities also have an interest in what they say about the company. For example, residents who benefit greatly from the presence of the company may wish to omit negative experiences, while other residents who experience many negative impacts

may do the opposite by amplifying their experiences. For this reason, it is very important to make sure that the research findings are formed from accurate interpretations. Two things helped me to be aware of this during the research process. First, I am aware that the experiences and understanding of reality of the participants determines their actions and responses and that a good interpretation can indicate why participants say or do certain things. Secondly, to ensure a careful assessment, the data was triangulated by comparing findings with other communities, CSO, government and company views during the analysis. Another potential risk for the research is that the sensitive and highly volatile local context results in socially desirable responses in fear of repercussions. In particular, there is a chance that the local communities will not report everything because of this fear. To prevent this, the fieldworkers who conducted the interviews were sent a manual, which stated, among other things, that they must first inform the community chairperson about the research in order for them to proceed, and that after explaining the research purpose, informed consent must be sought in which participants are guaranteed complete anonymity. Due to security risks and the sensitivity of the subject, precautions were also taken with regard to interview subjects about the security situation in Mozambique with the government official interview. It was made clear to him to talk about this on a completely voluntary basis. Furthermore, the restrictions imposed by the global pandemic is what I believe to be the biggest limitation of this research. Due to these limitations, it was unfortunately not possible for me to do the fieldwork myself, so I may have missed some contextual and experiential insights that I would otherwise have had. What has helped is that this research is largely grounded in the fieldwork of a PhD researcher from Utrecht University in cooperation with local researchers from Lúrio University in Pemba; close contacts with these researchers have nevertheless enabled me to gain a good impression of the local dynamics. Finally, the translation process from Portuguese to English that was necessary to analyse the interviews may have had an effect on the loss of certain nuances. Despite a careful process of rereading and retranslating interviews, it cannot be avoided that certain nuances are lost in this translation process. The close contact I had with the fieldwork researchers was therefore essential to understand certain issues in their full nuance.

## Chapter 4. National, regional and local thematic framework

This chapter provides thematic insight into the relevant national, regional and local contexts of Mozambique. First, a brief introduction to Mozambique's history, economy, mining industry and relevant legislation is provided (section 4.1). Then the relevant socio-economic and environmental events in the province are discussed (section 4.2). Finally, more information on the relevant context of the case study is provided (section 4.3).

### 4.1 Relevant national context

#### *Brief history Mozambique*

Mozambique is a south-eastern African country situated on the Indian Ocean and bordered by Tanzania, Malawi, Zambia, Zimbabwe, Swaziland and South Africa with a population of approximately 30 million. With the arrival of the Portuguese navigator Vasco Da Gama in Mozambique in 1497, Portuguese influence began to spread across the country. The Portuguese presence in the country led to Mozambique being officially recognised as a Portuguese province in 1884 and a Portuguese colony in 1910 (State University, n.d.). During this time, Mozambique was primarily a hotspot for slave trading, ivory trade, cheap labour and mineral extraction. The colonial era ended when Mozambique was declared independent on 25 June 1975 by the Marxist-Leninist Front for the Liberation of Mozambique (Newitt, 2017). Characterised by ineffective policies, failing governance and an exodus of population, the government lost grip on its control and ended up in a civil war that caused about a million deaths. The civil war ended with the signing of the Peace Accord of 1992 after which elections were called that introduced the democratic era and reformed the countries' Marxist ideology into capitalism.

#### *Mozambique's economic transition*

The years following the democratic transition were characterised by a major economic transition. Before 2011, Mozambique was mainly labelled as a low-income country that depended on official development aid (ODA). Since 2005, Mozambique's ODA has averaged 22% of the gross national income (GNI). This changed in the course of the years to 16% in 2011, as a result of which aid lost its relative importance as a state budget source (Vollmer, 2013). At the same time, Mozambique saw its foreign direct investment (FDI) percentage of its gross domestic product (GDP) increase from 1.4% to 25.4% in 2011 (World Bank, n.d.-b). This large increase can be linked to the natural resource booms in different areas of the country that, according to various researchers, characterise the economic transition from an ODA-dependent

economy to an extraction-driven economy (Anderson, 2012; Macuane, Buur, & Monjane, 2018). Despite Mozambique's resource availability, the country has not benefited much from the extractive industry to date (Macuane et al., 2018; Wiegink, 2018).

### *Mining industry in Mozambique*

The mining industry is generally very active in the African country. The increasing role of the international mining industry in Mozambique was accompanied from the outset by mining licence traders who were able to operate almost without government control (Hanlon, 2013). The wealth of resources in combination with the increasing trade in licences and the interest of multinational corporations has led to a sector boom in Mozambique. Although licence trading is a normal phenomenon in the mining industry sector, it has adverse effects because the government loses control over the resource. Due to a lack of financial resources and a lack of qualified people in the government apparatus at provincial and district level, the Mozambican government is not capable of dealing with the boom (Hanlon, 2013, p. 8). The consequences of the lack of a decisive government are the absence of a regulation system in mineral concessions, a lack of quantity and quality checks of extracted minerals and a lack of world market prices knowledge which results in tax avoidance by the mining industry. In addition, some argue that the arrival of the large FDI projects would not have resulted in major industrial activities or contributed to the national economy because business opportunities were captured by local ruling elite coalitions (Buur & Monjane, 2017).

### *Extraction legislation Mozambique*

Mozambique has a land law that states that all land is owned by the state while simultaneously rights to use and benefit from the land can be granted to companies, collectives, organisations or individuals under a “Direito de Uso e Aproveitamento da Terra” (right of land use and exploitation). Although informal communities that occupy a piece of land for more than 10 years have rights under Mozambican land law, we see that the Mozambican resource boom has to a large extent led to large land transfers from traditional and informal land users to large multinational corporations (Symons, 2016). This is because the revision of the 2003 Mining Law in 2014 has ensured that economic activity is given priority over informal land rights. Although the same law states that the affected party is entitled to compensation from the mining title holder, it is seen that compensation depends on communities' abilities to negotiate with large corporations (Vines, Thompson, Jensen, & Azevedo-Harman, 2015).



## 4.2 Relevant regional context

### *Poverty*

Historically, the province is known for its incorporation into violent regimes of control such as by the infamous colonial Nyassa Company and local informal and traditional systems, which is one reason for the province's uneven incorporation into global capital (Newitt, 2017). Compared to the highly concentrated population in the south, the north of Mozambique is much less populated. Cabo Delgado is also one of the poorest provinces in Mozambique. The historically remote province is experiencing an enormous influx of multinational companies due to resource discoveries. Not entirely by coincidence, the region is also experiencing a decline in the consumption-poverty rate from 63.2 in 2002-2003 to 37.4 in 2008-2009, a drop of almost 40% (Vines et al., 2015). While consumption expenditures have increased in those years, partly due to the arrival of multinational corporations, it is seen that, especially in the more rural northern provinces that include Cabo Delgado, poverty has increased in the past five years due to natural disasters, military conflicts and a debt crisis (Baez, Caruso, & Pullabhotla, 2018; International Growth Centre, 2020).

### *Armed conflict*

As indicated and in addition to the widespread poverty, the province has had to cope with an escalating conflict and deteriorating humanitarian situation due to violence from Islamic terrorist group Ahlu-Sunnah Wa-Jama (ASWJ) for several years now. But never before has the situation been as bad as it is today, as evidenced by the mass displacement of 565 thousand people (UN News, 2021a). The violence is linked to poverty, poor government functioning and contestation over resources by multinational corporations (BBC, 2020).

### *Cyclone*

To make matters worse, the region has to deal with natural disasters of tropical cyclones that devastate entire livelihoods. The most recent major cyclone, Eloise, hit land near Mozambique's city of Beira on 23 January 2021. The cyclone resulted in 6 deaths and damaged 8,800 homes and at least 26 health centres. It is estimated that 176 thousand people were affected by this cyclone in the midst of a global health crisis caused by COVID-19 (UN News, 2021b). This cyclone was however relatively small compared to cyclone Idai (March 2019) and cyclone Kenneth (April 2019) which have hit Mozambique and nearby countries in the same season.

Cyclone Idai caused a death toll of over 1000 (Reuters, 2019) and left 160 thousand people displaced (UNICEF, n.d.). While Mozambique was still recovering from cyclone Idai, cyclone Kenneth struck three weeks later and further worsened the humanitarian crisis.

### 4.3 Relevant local context

As mentioned earlier, this thesis will focus on the case study of the graphite mine of Syrah Resources which is located in the northern Mozambican province of Cabo Delgado. The company presents itself as a mine with a life span of more than 50 years that will play an important role in the global sustainability transition by supplying the green mineral graphite for the electric vehicle industry (Syrah Resources, n.d.). This section locates the project affected area in relation to the host communities and their farms, identifies the socioeconomic characteristics of the communities and discusses the company's sustainable development policies.

#### *Locating Project-Affected Communities (PACs)*

The mine site is located in the Balama District which is encircled by four villages, also called the Project-Affected Communities (PACs), namely Nquide (n=11 locals interviewed), Ntete (n=21), Pirira (n=12) and Mualia (n=10) (also known as Maputo). This term is attributed to communities that are expected to experience significant impacts on their lives and livelihoods (Syrah Resources, 2014c). Figure 2 illustrates the location of the mine in relation to the communities. Based on the local chiefs' estimate, 11048 residents are located in the 4 PACs, which means that the 11048 inhabitants of these 4 communities are directly impacted by the presence and operations of the mining company (Syrah Resources, 2014c, p. 31). The District's headquarter, Balama town (n=10), is 9 km from the mine and according to Syrah's Resettlement Action Plan (RAP), it is also included in the PACs (Syrah Resources, 2014b). The villages of Marica (n=11), Nanhupo (n=10), Nacole (n=11) and 7 de Setembro (N=2) are further away and, according to the company's RAP, are outside the PACs. The interview data from these communities have been included in these findings to assess how far the impacts of the company reach. Almost all houses in these communities are made of mud and wooden poles, all-natural construction resources which are collected in the immediate vicinity of the villages.

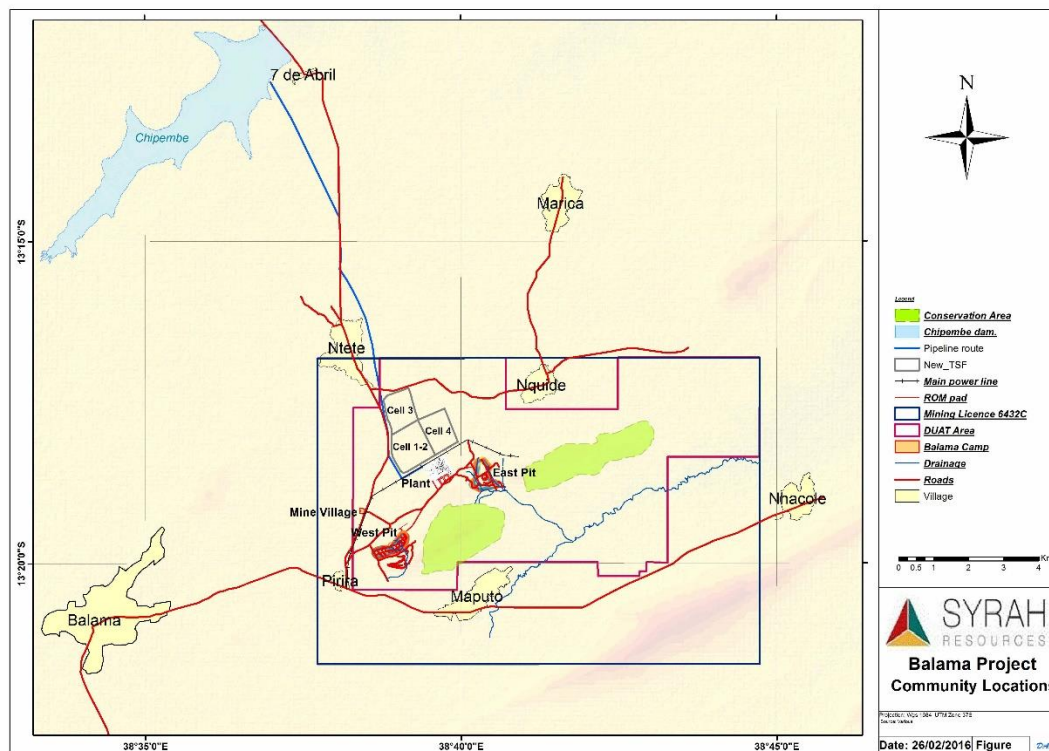


Figure 2. Locations of surrounding communities in relation to the project (Syrah Resources, 2016)

### *Economic displacement of Machambas*

The mining company settled on cultivated farmland (also called "Machambas" in Mozambique) belonging to local farmers in the PACs. Since none of the farmers lived on their farmland, but in the nearby villages, there is no physical resettlement of households, but only economic resettlement, which, according to the company, entails the loss of many agricultural fields. The International Finance Corporation (IFC), a member organisation of the World Bank, defines economic displacement as “Loss of income streams or means of livelihood resulting from land acquisition or obstructed access to resources” (International Finance Corporation, 2002). According to the mining company's Resettlement Action Plan, this displacement involves the loss of farmland and certain structures built on it such as storehouses, resting huts, temporary kitchen huts and sheds. According to this report, the mining company would settle on farmland totalling 667 machambas. Figure 3 illustrates and shows proportionally the impact of the mine settlement on the farmlands of the local communities.

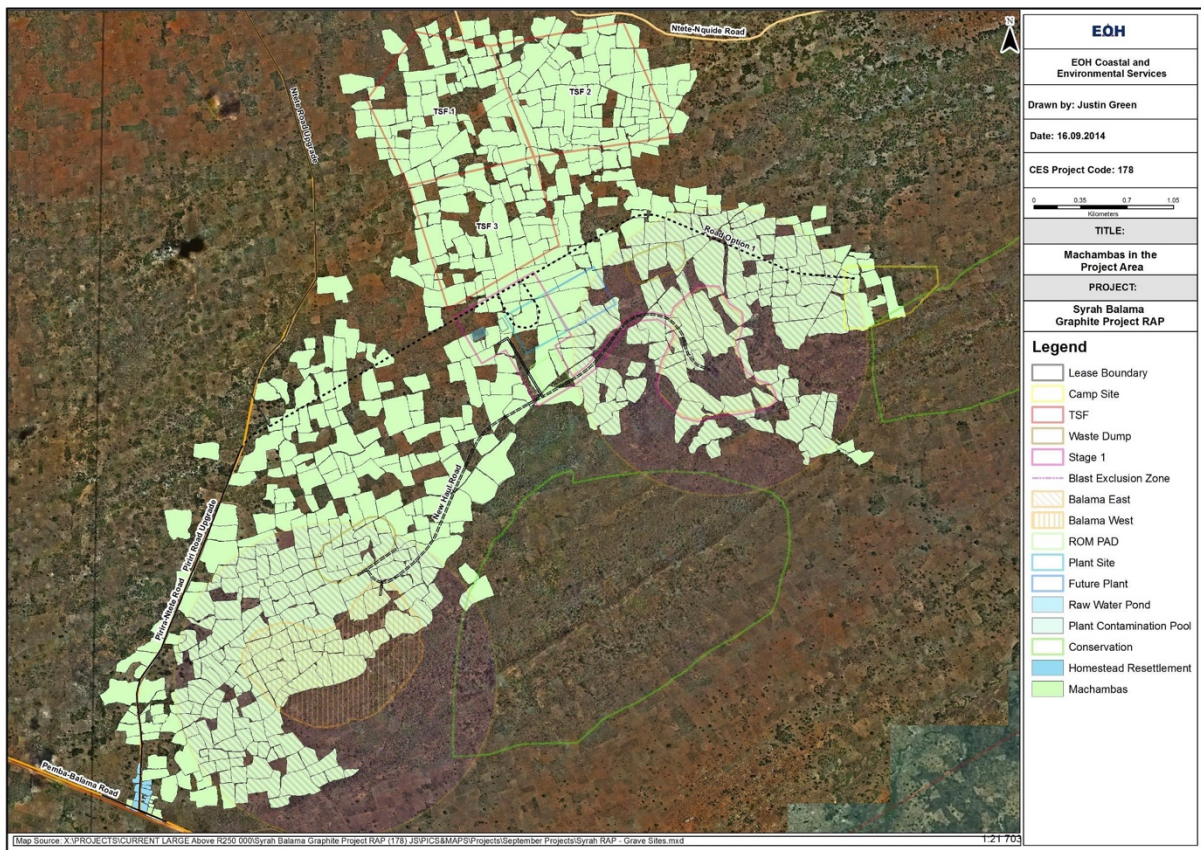


Figure 3. Allocated Machambas for economic resettlement (Syrah Resources, 2014b, p. 9)

### *Daily occupation*

The vast majority of the inhabitants of the communities are smallholder subsistence farmers who make a living from what they produce on their land. As the figures of the 2007 Mozambican Census show, agriculture together with forestry and fishing accounts for 95.4% of the employment sector of the Balama district (Syrah Resources, 2014c, p. 46). Agriculture and food security are interlinked and cannot be separated. Since agriculture in this context is primarily about gathering food for one's own consumption and livelihood, it is not possible to separate the two. What remains of the harvest is how local farmers primarily provide for themselves in terms of income.

### *Education*

In general, the farmers' children either go to school or help their parents in the fields. Looking at the data from the socioeconomic baseline study (SEBS) of the social impact assessment report by Syrah Resources (table 4), it is seen that the educational status of the village members above the age of 18 is not great. As can be seen in the table, a significant 55.8% of PACs

members have no education whatsoever, and only 3.3% have completed primary school. Although there is a primary school at every PAC, the closest secondary school is at Balama town, which quickly becomes a serious constraint on attendances because of the distance.

Education	N	%
None	339	55.8
Some primary school	223	36.7
Completed primary school	20	3.3
Some secondary school	22	3.6
Completed secondary school	3	0.5
TOTAL	607	100.0

Table 4. Educational status village members (Syrah Resources, 2014c)

*Health*

The Resettlement Action Plan report of the mining company also shows that the communities in the region face a number of health challenges. It mainly shows that poor access to drinking water in combination with poor sanitation facilities contribute to poor living and health conditions. In terms of health threats, it is assessed that Malaria is a major issue, and HIV/AIDS is also identified as a prevailing problem (Syrah Resources, 2014b, p. 51). Infectious diseases such as cholera outbreaks and meningitis also occur in the communities. Access to good health services is also difficult, since there is only one clinic in the PACs, namely in Ntete.

*Commitment to local sustainable practices*

Syrah Resources has a sustainability strategy covering the key objective of "Operating safely, ethically and efficiently to create value for our people and stakeholders" (Syrah Resources, 2021). By anchoring this strategy in five key performance policies, these being health & safety, people, environment, community development, stakeholder management and governance, the company aims to contribute to sustainable development. The first key performance area, health and safety, is to guarantee that the company's activities are carried out in such a way that there are no negative health and safety effects for its employees, contractors, communities and stakeholders. The second key performance area, people, seeks to reach out to host communities and embrace the diversity these communities offer for the benefit of the business and local development. The third key performance area, environment, aims to align the company's operations with international standards of environmental sustainability and to minimise its operational footprint. The fourth key performance area, community development, aims to contribute to the local development of host communities and to building local capacity beyond

the mine's operation. Finally, the fifth performance area, Stakeholder Management and Governance, is about strengthening relationships with governments and communities through proactive stakeholder management to achieve the company's long-term sustainability goals and mutual benefit.

## OUTLINE OF RESULTS CHAPTER

The following chapter presents the findings of the research questions and data analysis of this study. As it examined how Syrah Resources relates to the imperatives of sustainable development, the following chapter sections are structured according to their concepts, so that the key messages of this study are best reflected.

Section 5.1 deals with how the company relates to ensuring social equity. To assess this, the public participation procedures were examined, the socio-economic impacts caused by the company were analysed, the company's efforts to address these impacts through compensation were examined and the functioning of the grievance mechanism was studied.

Section 5.2 is about how the company relates to satisfying human needs. To assess this need, Syrah's efforts to improve local livelihoods and what its local employment strategy has meant for local communities in terms of local development and implications have been examined.

Section 5.3 deals with how Syrah Resources relates to the sustainable development imperative of respecting environmental limits. To assess this, research has been done into the environmental impacts that local residents report having experienced.

## Chapter 5. Sustainability paradox in the green mineral mining project of Syrah Resources

It all commenced with a sample of the soil, says a resident of Ntete: *“First a helicopter came and landed on my machamba [farm], then they took a sample of the soil and said that they will come back later [...] They put the soil in plastic and took it to the helicopter, after some time they came and said that they would start the work, everyone that lived nearby was taken away.”* (Interviewee 21, Ntete). Another resident of the same village came across the company's plans during a meeting and said the following: *“They met us in 2011, the company said that they were coming to work, they said that they would take our fields and that they would pay for them and give us new fields to replace them.”* (Interviewee 1, Ntete). In Pirira, the company representatives visited the village secretary on their arrival and told him that they wanted a place near the mango plantation because they wanted to pitch their tents there. When the Secretary asked if they would be camping there for a longer period of time, he was told in the affirmative that they had come with a programme and that their request would be clarified soon. The village secretary of the Balama town states that the arrival of the company was accompanied by certain expectations: *“When the company arrived, there was a meeting with the leadership structure and those responsible said that the company would belong to the community.”* (Interviewee 1, Balama town). Such introductions are generally reported on the arrival of the company. That the company was suddenly there and took samples at specific points to study it for the presence of graphite. When it appeared that the area was suitable for exploitation, the company continued the implementation process. On the basis of GPS measurements, the required pieces of land for the graphite mine were demarcated. A local landowner from Pirira reports the following about this process: *“Mainly, there was GPS, they used it to see where your field was, they delimited your field, they wrote it down in a place, they were done, and said you can go home, so you were going home. After four days they called you to bring documents, you took them there, and when you got there with the documents they took them and said okay, tomorrow come and get money here.”* (Interviewee 7, Pirira). Once the soil investigations were conducted and all the necessary arrangements for the establishment of the company were identified, the company communicated its plans by organising several meetings with the local communities, also called public participation meetings.



## 5.1 Ensuring Social equity

Adequate public participation in such a large project is essential in order to strive for the fairest possible process in which everyone is aware of all the information and all the intended plans and is able to express his or her thoughts. This section first presents the public participation activities carried out and then discusses the extent to which the key informants believe the public participation was adequate. This information is important to understand how differences in perceptions between the parties can be explained.

### *Ensuring adequate public participation*

#### Public Participation activities

As reported in the Public Participation Process report by Syrah Resources (Syrah Resources, 2014a, p. 19) the first public participation activity per Project-Affected Community was to establish a Technical Working Group (TWG) for each village and to introduce the RAP social team. The TWG is composed by appointing two representatives from each village, involving one representative from Civil Society, four community leaders and two representatives from the private sector. The election of the community representatives was left to the villages. The main objective of the TWG is to be part of the planning process of the mine, identify households and farmers at risk of economic displacement, influence and mitigate impacts on cultural, traditional and religious matters and manage the Grievance Mechanism (Syrah Resources, 2014b, p. 35). The RAP social team, an independent party according to Syrah, was created to “safeguard the interests of the villagers in order for the mine not to affect the villagers’ livelihood negatively” (Syrah Resources, 2014a, p. 17). All initial activities related to the first round of Public Participation took place in the month of July 2013. The second Public Participation round took place in August 2013. This round focused on visiting the RAP site and all households and machambas within the Mining's Area of Influence (AoI). The aim was to inform the communities about the farmland assessment and displacement process and to set up a Grievance Mechanism. In addition, the distinction between the loss of land and the loss of crops and structures grown on that land was also discussed at this meeting. It was clarified to the local farmers that by law the government is responsible for finding alternative land and that the company is only responsible for providing compensation for the loss of crops and the structures built on the land, such as sheds and storehouses. During the third Public Participation meeting held in the months of November and December 2013, a meeting was held with the four PAC leaders to inform them and seek their consent for a new assessment of farmland

displacement for additional machambas that had been missed during the previous survey period. In the month of May 2014, the last round of consultations took place. This meeting focused on assessing the displacement of remaining machambas, presenting the draft Resettlement Action Plan report to the communities, and discussing the compensation packages with the TWG and affected farmers.

#### CSO perspective

An important key informant in the Syrah Resources public participation process is the civil society organisation Centro Terra Viva (CTV). CTV is a non-governmental organisation that works to bridge gaps in the implementation of projects that impact local communities due to lack of education and information. CTV locates such projects by looking for 'hotspots' which are projects that are likely to allocate or generate conflicts in their implementation sites. By making this inventory in a timely manner, CTV tries to monitor it from the beginning in order to prevent any upsets from occurring. In the case of the Syrah project CTV was involved in the implementation process from the beginning. They also participated in the community consultations and were involved in the entire environmental licensing process. The form of involvement was physical participation. During the community consultation and implementation process, this involvement consisted of preparing the local communities with regard to resource exploitation and aligning the company's activities with relevant legislation. Renato Uane, a researcher at CTV, says the following on the involvement of the organisation: *“we try to address and equip it with all pertinent legislation about these processes such as the land use regulations, the laws governing resettlement, economic compensation, forestry exploitation, the environment law, the constitution of the republic, and therefore, everything that contributes to the sustainable exploitation of natural resources, but focusing on communities directly involved in the locations where megaprojects take place and which suffer or would suffer directly or indirectly the impacts of exploitation.”* When asked to explain why the involvement of the CTV is important in the process, he gives the following answer: *“Why? We think it is important to be involved in these projects to ensure that they occur in the best way, because in the extraction industry not everything is positive and if left alone, things may not run within the established parameters and therefore bring damage to the environment. And our intervention is to avoid this and to ensure that these projects bring significant gains for the communities around them.”* When asked next about CTV's opinion on public participation, he said he believed that involvement was positive and sufficiently acceptable because local communities were consulted and could be prepared in a timely manner by CTV.

### Company perspective

When asked to reflect on the adequacy of public participation, the company itself refers to CTV's generally positive assessment. The former social officer highlighted in particular the extent to which different parties are represented in public participation activities. Examples of the variety of parties involved include different levels of government representatives, community leaders, CSOs, Farmers Union, representatives of youth, women, religious and traditional leaders. According to the company, the involvement of these parties is a testament to the appropriateness of the commitment of various parties.

### Local perspective

According to the inhabitants of the affected villages, these meetings were more like a one-way announcement of what was going to happen now that the company was planning to settle down for the long term. Accompanied by government officials, company representatives informed the local community of Pirira that a site for the graphite mine had been chosen in advance on the basis of exploration. One of the residents of Pirira reports: *“Well, at the beginning the company came to the district government and said that they wanted space to settle because they were going to work there on the mountain. And the government came to inform us together with them and we said look, we have our farms there, and the company representative said that, in fact, they had already chosen a space to stay. That was there in the mango plantation (designated mine location) where they stayed for about a year doing some excavations in the mountain.”* (Interviewee 5, Pirira). The presence and interference of the government and local leadership in the process was reason enough for some landowners not to object to the company's plans: *“they said that each person would receive 60,000 per hectare, but we did not want to receive this amount because we thought it was little for what they were going to take from us, but because of threats made to us by the chief of Ntete we ended up accepting.”* (Interviewee 10, Balama Town).

The difference in vision between the parties can be explained by the difference in views on how to measure adequate participation. Based on the narrative of the company and the CSO, they believe that the best way to measure the adequacy is to assess the extent to which the project has involved different groups from the communities in the process, i.e. the degree of inclusiveness is considered the most important starting point for an adequate process. The local communities, on the other hand, are more inclined to judge the process on the basis of the

difference they can make. Based on this interpretation, one might wonder what the value of a well-executed participatory activity is if the participants in it do not feel they can actually "participate" because the plans have already been laid down and can no longer be influenced, or because participants have not dared to speak out because of fear for repercussions. If the interpretation of a well-executed public participation process is on inclusiveness rather than on the extent to which included groups or individuals can exert influence, then it becomes clear that these participatory events fall short of giving participants a voice.

### *Socio-economic implications of economic displacement*

#### Implications loss of agricultural land

667 is the number of farms that have to make room for the land acquisition of the graphite mining project of Syrah Resources. Behind this number is the story of about 700 households that depended on the machambas for subsistence and commercial farming. The loss of agricultural land has a number of negative impacts on local communities. Firstly, the loss of land through land acquisition reduces the available land on which households in local communities depend, since most households practise subsistence farming. This leads to scarcity of agricultural land. It is therefore not surprising that, when asked if there has been a change in access to land, local residents indicate that there is a high demand for agricultural land, and that it is difficult to find a new plot of land as there is not much space locally for new farms because the project occupies such a large area. A local resident from Balama town talks about how the region used to be seen and known and what the arrival of the project has changed: *"We have seen that many people have lost their farms exactly because of the presence of the company, and Balama used to be considered as the granary of Cabo Delgado, but today people have lost their farms and their agricultural production which used to sustain several people."* (Interviewee 3, Balama town). Secondly, with the loss of a large section of agricultural land on which the local communities depend in relation to food security, the project has an impact on local food production and demand. With many subsistence farmers losing land and new land difficult to find, the serious problem of not being able to produce their own food has emerged. Since the predominantly peasant population in the region depends on their own food production, this project not only affects the households that have lost land, but also creates pressure on the remaining food producing communities in the region due to changed demand for food. A testimony from a local resident from Ntete outlines the situation that has emerged: *"there is a lot of suffering in the communities, mainly in Pirira, previously it was a promising*

village, they used to cultivate everything on the mountain which the company has occupied, but now they have nowhere to weed, and they even come to buy cassava from us because they no longer have any, it is a very suffering life.” (Interviewee 10, Ntete). Thirdly, many residents complain that losing their land has caused much suffering and hunger. The word 'suffering' appears 29 times in the interview data from the local communities. By far the most common citing of suffering is linked to the impacts that result from no longer having agricultural land because of the company's establishment: *“That means when we came here our plan was that we would have food, sell it since we are near the road, and have a livelihood. But when we came and lived here before the graphite company, we were fine. But since it came we are suffering, they have already taken us away from where we used to harvest, and we are suffering nowadays.”* (Interviewee 2, Pirira). Fourthly and finally, the loss of agricultural land is also associated with hunger caused by not being able to produce one's own food, as the following example from a resident of Balama Town shows: *“When they uprooted me I stayed in my house starving, but when I was there [in his machamba] I didn't buy food because I produced it myself, from beans to groundnuts to cassava”* (Interviewee 6, Balama town).

#### Implications loss of livelihood sources

As mentioned, the cultivation of the land was consisted mainly of subsistence farming, the growing of one's own crops for one's own living. It is assessed that the loss of farmland had first and foremost direct consequences for the food provision from which these farmers lived, but no less important, the loss of their land also meant the loss of the possibility to generate income. It is a well-known livelihood strategy of many local farmers to also sell remaining crops that are not consumed to generate an income. The loss of this livelihood resource has a major impact on an already poor household. Firstly, the loss of their own food production and the fact that they therefore have to buy food, coupled with the loss of the extra income they were able to generate, disproportionately changes the spending pattern of these households. This creates an unsustainable situation that threatens the livelihood of these households. Secondly, the loss of this income also stands in the way of achieving long-term goals that contribute to poverty reduction, namely through education. With the extra savings from commercial farming, households were able to set aside money to invest in their own education and that of their children, which is no longer the case. The following phrase from an interview with a local resident of Nanhupo confirms this: *“I did not like the fact that they took away my machamba where it was my source of food and income, to give me a value that I was not satisfied with. From that machamba I was paying for my studies and my children's studies, but*

*today I had to abandon my grade 12 because I no longer had money to afford it.*” (Interviewee 5, Nanhupo). Another resident of Pirira complains about the same thing: *“they had simply taken away our machambas, [...] while we relied on the machamba, and our children studied thanks to the machamba. Yes, and until now I don't know what to do, or how to get my children to study.”* (Interviewee 8, Pirira). Thirdly, the impacts that caused land scarcity are reason enough for some residents of local communities to seek refuge elsewhere: *“some people moved to other villages because they had nowhere to weed, imagine if you have 5 children and you don't have an agricultural plot that produces, how are you going to feed your children? That's why they move to other villages.”* (Interviewee 10, Pirira). Fourth, the loss of the area now covered by the graphite mine also has an impact on the availability of local resources: *“Currently I search [for local resources] in the bush, there in the company it is forbidden. And all the natural resources that gave us benefits we used to extract from there, but nowadays it is not possible.”* (Interviewee 10, Balama Town). Indeed, the area was also known to be rich in natural resources. The loss of these in a region where houses, structures and tools are made of these natural resources and where the climate regularly damages these properties, represents an impact and a serious threat to the resilience of the communities. Finally, the loss of these sources of livelihood by which the households made their living also led to increased social unrest in the local communities: *“[...] it [the presence of the company] messed up our heads, some people started stealing, others went crazy out of frustration.”* (Interviewee 4, Ntete).

Apart from the obvious explanations of the impacts described earlier that can be ascribed to the establishment of the mining company, the occurrence of these impacts can also be explained by other factors. For a more complete understanding, it is good to look at the role of the Mozambican government in facilitating or preventing such implications. First of all, it is important to ask whether the Mozambican government is prepared to manage such projects. It is relevant to know this since large-scale projects like this one are a relatively new phenomenon for the country, as Renato from CTV made clear: *“As you can imagine, the level of understanding in relation to finances and other aspects of the project is low, because these are new things for our society and even for us too, it is not easy to have knowledge of all the contours of these processes.”* As can be understood from the following passage, Syrah's former social officer questions this: *“I think that the Mozambican government has never been prepared to host such big projects. Our legislation has always been weak [...] they [companies] take advantage of this because [...] they come to do business”*. From this it can be suggested that the lack of experience of the Mozambican government with such processes plays - albeit

unintentionally - a facilitating role in allowing impacts to take place. Secondly, if then asked whether the government official believes that the current legislation is capable of managing mega-projects adequately he replies: *“No. Some things need to be rectified from what I see, there are some gaps and I am talking exactly about the mining legislation”*. The gaps he talks about would include too high compensation rates and a too slow implementation process that *“scares away big investors”*. From these statements it can be concluded that the government is more concerned with creating a pleasant environment for foreign direct investors than with prioritising the addressing of the potential negative impacts that these investments have on Mozambican communities. Thirdly and finally, the financial and economic situation of the country limits the means for the Mozambican Government to be continuously present and to adequately monitor the projects. As the following narration from the government official shows: *“In cases where the access roads to reach the company are difficult, we can only get there with the help of the company itself, therefore, it is these difficulties which have weakened our monitoring process.”* Interviewer: *“Does this mean that there is no constant government presence in these areas and therefore the current form of supervision is not sufficient?”* Government official: *“Given our financial and economic environment. Therefore, this particularity makes it necessary for us to have our own resources, because it makes no sense for me to drive up and down in a company car to check on the same company.”* Interviewer: *“Right, it doesn't make sense”* (laughs). Government official: *“That makes us very weak.”*

### *Livelihood restoration*

Given the impacts and economic displacement that residents of local communities have suffered as a result of the mining company's land acquisition or other mining-related developments, Syrah Resources has developed a plan to compensate farmers for the losses they have suffered. The compensation scheme of this plan can be divided into two types, financial compensation and land-based compensation.

### *Financial compensation*

The first compensation package consists of a financial compensation determined on the basis of the loss of crops and fruit-bearing trees. When looking at how the amount was constituted precisely and inquiring with Syrah's former social officer, it appears that the company does not owe them any amount for taking possession over the land, because it is established by law that the land belongs to the Mozambican government. According to the law, the company is only

responsible for the compensation of what has been cultivated and invested on the piece of land: *“Basically, back then, [the compensation] did not include a possession for land, this land is government owned, and the compensation is only for the assets and the investments made on the land. By investment I mean effort for you to clear the land the effort for you to build structures for you to plant different crops. land itself as per Mozambican law is government owned, it can't be sold. That's what the government law says. So, people are only compensated for the investment they put on the land.”* (social officer Syrah Resources). About this financial compensation, it is found that there were high expectations based on locals' understanding of the communication of the company's plans. It is during the public participation meetings that farmers were informed about the compensation rates they would receive as a result of losing their land. It is noted that farmers report differently on the notified compensation they would receive and on the actual amount received. For example, a number of interviewed farmers reported that 100 thousand Mozambican meticaís (approximately 1570 USD) or more would be paid per hectare. Others reported an amount of around 60 thousand Mozambican meticaís (approximately 940 USD). What is certain is that there is doubt among the locals about the exact amount they would be entitled to per hectare of land and a widely held opinion among them that the financial compensation was insufficient in comparison to its loss.

In order to arrive at a compensation rate, negotiations with the local farmers are necessary. The former social officer recognises that this is a controversial process and says the following about this: *“basically the compensation rates, although the law says they have to be negotiated, it's a bit controversial and it's a bit contradicting because the government has already set rates for different assets”*. Since the farmers grow a variety of crops and because the precise crops grown by each farmer is difficult to determine, it was decided to assume that all farmers grow one type of crop and to set the compensation at the farmers' maximum productive value per m<sup>2</sup> of agricultural land. The former social officer explains: *“they mix up crops like maize, cassava, sesame, groundnuts, beans etc. So, we said because out of all these crops, the most valuable in terms of rate is sesame, we will assume that every field is full of sesame. This was to avoid that farmers would be compensated for low rate crops in terms of compensation. This was a goodwill from the company because we recognized that the other crops had a very low rate in terms of compensation.”* However, if we look at the compensation rates for the crops mentioned by the social officer - maize, cassava, peanuts, beans - as shown in table 5, we can see that sesame comparatively had almost the lowest compensation rate of all the crops. Two things stand out about this observation which indicates a bad outcome of the negotiation for the local



community. Firstly, the bargaining power of the local communities can be considered relatively weak, as the local communities do not have the pertinent knowledge and resources because of their living conditions and because they have probably never experienced such processes before, compared to the company that does have sufficient resources to hire professionals for this purpose. Secondly, the statements of Syrah's former social officer indicate that the government does not encourage them to pay a higher compensation: *“We would go for the highest rate on the table for all of the crops. But again, I remember back then the government is saying, look, you guys will set a very bad precedent for other projects, and for the government itself.”* With these two considerations in mind, the relatively poor outcome of the negotiations for the local communities can be explained.

Crop		Column A	Column B
Local Name	English Name	Price/m <sup>2</sup>	Price/m <sup>2</sup>
Milho	Maize	6.40	6.72
Mapira	Sorghum	1.28	1.34
Mexoeira	Millet	1.20	1.26
Cana de Açúcar	Sugarcane	12.00	12.60
Mandioca	Cassava	15.00	15.75
Batata Reno	Potatoes	80.00	84.00
Batata Doce	Sweet potatoes	50.00	52.50
Feijão Vulgar	Vulgar Beans	6.00	6.30
Feijão Nhemba	Cowpeas	3.00	3.15
Girassol	Sunflower	1.80	1.89
Soja	Soy Bean	3.60	3.78
Gergelim	Sesame	6.00	6.30
Amendoim	Peanuts	7.50	7.88
Algodão	Cotton	3.00	3.15
Aface	Lettuce	30.00	31.50
Repolho	Cabbage	42.00	44.10

Table 5. Crop rates as set by the government of Mozambique for 2013 [column A] and 2014 [column B] (Syrah Resources, 2014b, p. 72)

Part of the compensation package, in addition to paying for crops, is paying for trees. For this calculation, the number of trees per farm was considered individually. However, no distinction was made between small and new trees and mature, fruit-bearing trees, contrary to what was advised by the government's compensation rates. All in all, the question can be asked to what extent this compensation strategy actually involved 'goodwill' on the part of the company because the amount could actually be higher with other choices. Furthermore, it is clear that farmers are not given financial compensation for the loss of their landholdings, while the data

shows that it is customary to buy and sell land, the company maintains that they are not obliged to do so by law because the government owns the land. The following testimony from a local resident who complains that the financial compensation is not enough to buy other land, shows that such informal transactions do happen: *“The suffering is huge. In the past we produced maize, sorghum, rice and much more because we trusted that land a lot. Today we have no fixed land and many people are suffering because they don't have money to buy fields.”* (Interviewee 1, Pirira). Considering that some peasant households have paid for the land that has now been taken away from them by the graphite mine, it can be said that the peasants have not been fully compensated for what they have actually lost. It is therefore not surprising that many interviewees complain that the compensation is not nearly enough to cover their losses.

The method by which the aforementioned financial compensation was paid out was not flawless either according to the locals. Although the RAP includes a roadmap for the payment method to ensure a transparent and accurate process, there are many doubts among local farmers about the implementation of this process. The plan describes that a non-governmental organisation must be present during the whole payment procedure and that signatures must be taken, together with photographs of the farmers to be compensated as proof of payment. The farmers themselves report the following about their experience of this process: *“They gave us the amount in an envelope with the name of each owner written on it, you would take it home regardless of whether you found anything in it or not, and those envelopes they bought here, and they didn't seal it. They gave us the amount and then we put it in the envelope and then they took pictures.”* (Interviewee 4, Piria). The village secretary expresses his concern about the process as follows: *“After all, the money came in an open envelope without the name of the person, but they wrote the amount, and we were worried about this.”* (Interviewee 1, Pirira).

#### Land-based compensation

In addition to the financial compensation the mining company made a commitment to ensure the provision of alternative pieces of land of equal or better quality: *“Alternative machamba land of the same or better value will be offered by the GoM for each impacted machamba to the respective farmer. The proponent, however, shall play an active role in assisting the Government to assess and allocate such alternative land.”* (Syrah Resources, 2014b, p. 60). Although finding alternative land is not the responsibility of the mining company, they want to help the government look for similar land elsewhere. A number of things can be noted about the process of giving away alternative land as an additional form of compensation to affected

farmers. It is reported that this process of alternative land compensation did not generally follow the mining company's commitment. The commitment that the company has made is described in the company's RAP as follows: "Replacement land should be provided to each affected farmer following compensation payment and needs to be an interactive process between the mine, the affected farmers and communities. Each affected farmer should agree on the location of the new land, the quality of the land (soil composition etc.), as well as the distance of the new land to the respective household's physical house and social networks." (Syrah Resources, 2014b, p. 69). As the following testimony will show, the alternative land compensation process is not in line with what the mining company has committed itself to: *"They should have asked us as a community where we want the other farms to be. If they want to take us away from here and give us new farms, let them give us money, because somewhere here there are no good soils for farms. Each one of us here has a friend outside who could give him a good farm to cultivate, because in fact in these farms that they gave us, nothing is produced."* (Interviewee 8, Pirira). This shows that the affected group of farmers had no say whatsoever in determining the location of the new land they received. It also shows how the affected person feels about the quality of the alternative land he received. As can be read in several interviews of the local residents, they are generally very dissatisfied with the quality of the new piece of land. For example, the new land considered unsuitable for the crops preferred by the local communities: *"The company said that it would take the people to new farms and when they arrived there, the space was not suitable for multiple cropping as it was swampy and could only be used for growing rice."* (Interviewee 9, Nanhupo). In addition to the fact that not all crops to the preference of the local communities could be grown, farmers report that the new land is also less productive by comparison: *"The current productivity does not compare with what we were doing in that area because at that time we were able to produce corn, sesame, cotton, beans, everything could be cultivated because it was a fertile area."* (Interviewee 10, Nanhupo). The promise that the new land should be as good or even better than the lost land has not been kept either. This is therefore the biggest thorn in the side of the affected farmers. Many farmers claim that the new land they were offered was flooded and swampy and that preferred crops simply do not survive there except rice: *"they promised to give us an agricultural field the same as the one they took from us and days later they took us to a flooded land in Marica village and we couldn't stand it because apart from being far away, we are not used to growing only rice, but cotton and cotton can't be grown in a flooded land and so we didn't go."* (Interviewee 4, Pirira). It is notable that many farmers were so dissatisfied with the quality and location with the new land they were given that they gave up and simply did not accept the offer, ultimately leaving

them empty-handed: *“We were given fields very far away in water, a lot of water, we were told that each one should go and take measures there, and we said no, there is only water there, and we were getting food here where you pulled us out and the place you are taking us we are not going, everyone had denied to go there, even the fields in Ntete we denied it.”* (Interviewee 5, Nquide). As part of the material compensation, the company also distributed seeds to individuals as compensation. In addition to the fact that, again, this compensation was not done in consultation with the local community, the following is also mentioned about this: *“She had brought me these cashew trees, but I refused because, where am I going to plant these cashew trees if I don't have land to plant these trees?”* (Interviewee 11, Pirira). This again shows that there is a mismatch between the needs of the affected community and the compensation actually paid. Many of the farmers who have refused the poor quality alternative land therefore have nothing to gain from this additional compensation.

The clearing of the to be compensated alternative farmland was not without its difficulties either. In the areas where the company, in agreement with the government, made land available for compensation, the indirect result was a second economic displacement and farm resettlement of other communities: *“They had said that in addition to the 60 thousand we would receive a machamba, and this new space was arranged in Marica and belonged to people from that community, and to give it up they also demanded payment and this generated conflict over land, and until today the land is with the owners. In the same way they went to Nacole (to clear land) and nothing succeeded, and we returned to our village because they didn't agree to give the space for free.”* (Interviewee 10, Balama Town). This highlights the importance of the additional data collection from communities outside the PACs. As the analysis of these data shows, the impacts of the mine go beyond the PACs and other matters taken into account in the SIA and RAP reports. This process has not only caused contradictions in the resettlement principles but has also affected intercommunity relations and created tension and conflict between them: *“We went there to be presented with the new fields and the community of Nacole revolted against us and had machetes in their hands to intimidate us. We went back and complained to the company, we went to Pemba to present the case and the Pemba authorities came here and met with the mining company and nothing was successful.”* (Interviewee 2, Pirira).

The feeling that the farmers have been left with after this experience is considered by many farmers as being cheated. Many farmers report about "lies" disguised as empty promises that

were made to convince them of the plans of the mining company: “Yes, I myself had a *machamba* in that area and they moved me out with lies that I would have a new place and goods but until today I have not seen any of that” (Interviewee 10, Balama Town). When we questioned Syrah's former social officer on this matter, he said that there was a distinction between promises made as described in the RAP and requests from the community in which the company could mediate regarding the duty of governments to provide such services. According to him, the company could never bear this responsibility of community requests alone because the responsibility of such public services lies with the government. We have seen how the company deals with the commitments they have made in their own reports. The company has not kept all the commitments by a long shot. We can therefore state that the requests from the communities towards the company during the community consultations were, from the perspective of the locals, seen as promises that the company would keep as compensation for the impacts they would experience. This finding is important because local communities act on their understanding of reality and do so from their own insights and perspectives. The fact that the communities have perceived these requests as commitments from the company therefore explains why their actions and attitudes have been so accommodating towards their acceptance of the plans of the mining project.

### *Grievance mechanism*

An important mechanism through which local communities can seek redress for unaddressed impacts they experience is the grievance mechanism set up by Syrah Resources, in accordance with IFC Performance Standard 5. The main purpose of the grievance mechanism is to provide PACs with an accessible way to submit and resolve their complaints and disagreements about the project. The grievance mechanism also plays a role in initiating corrective actions in the operations of the project and, finally, in avoiding the need to resort to legal proceedings (Syrah Resources, 2014b, p. 42). According to Syrah's RAP, grievances from the PACs can be shared by making a verbal or written formal statement of dispute or claim to the TWG community representatives, village chiefs or directly to the mine itself. Involved in the process of the mechanism, according to the former social officer, are the government, the local community leadership and a civil society organisation.

As the following accounts show, there are different views on the functioning of the grievance mechanism. The company itself is satisfied with how the mechanism works, which they say

works quite well. According to Syrah's former social officer, most of the grievances are captured and addressed by the mechanism. Local residents, on the other hand, report different experiences with regard to the resolution of problems that arise. For example, some residents complain that many problems and grievances remain unresolved. A Pirira resident said the following about those involved in the complaints mechanism and his experience of its operation in seeking solutions: *“Here there are still problems, these problems are related to our fields because it did not happen as we had agreed, there were many problems and even the district knows about it, the case went to the province but until now there is no solution.”* (Interviewee 8, Pirira). This statement demonstrates the government's presence in addressing grievances, as disclosed by the government official: *“the company tries to reach an understanding with the district government on how best to achieve a solution depending on the nature of the problem.”*

The different views on the functioning of the complaints mechanism can be explained in three ways. First, the perceived difference between the communities and the company can be explained by the inability of the grievance mechanism to address the local communities' biggest grievance, which is losing their preferred farmland to the mining company. When plans are made to provide affected farmers with new farms elsewhere and local communities protest against these plans, nothing seems to change. As can be seen from the following testimony of a resident of Nanhupo: *“They came up with the idea of getting new farms for us and they took people to areas where there were land conflicts, but we refused and asked for the money because we are the ones who know fertile land, they insisted with their idea and they ended up taking people in flooded and salty areas and people ended giving up.”* (Interviewee 10, Nanhupo). A second explanation for the fact that local residents feel differently about the grievance mechanism is that they have not dared to use the grievance mechanism or other forms of expression for fear of the government who is involved. As evidenced by the statement of Syrah's former social officer: *“in resolving all of the grievances, we need to engage the government.”* Although the presence and involvement of the government served as an assurance of proper handling and resolution of grievances, it was by no means experienced that way by everyone. For instance, the involvement and interference of the government in the process would be enough reason for some landowners not to object to the company's plans: *“We have not done anything, we have stayed put, you can't mess around with the government, if they want to take something, they will take it, so we have nothing to do and this land belongs to God.”* (interviewee 21, Ntete). The third explanation why local communities may feel that problems are not solved is possibly due to the sometimes slow procedure for handling

complaints. *“The main problem with grievances is response [...] the time that the grievances arose, to the time that the grievances were closed.”* (Social officer, Syrah Resources). Grievances are complex in nature and resolving them requires precision and certain cooperation and involvement of stakeholders in the mechanism. According to Syrah's former social officer, this diligence and involvement causes delays, which in turn causes irritation and lack of understanding among the local population.

## 5.2 Satisfying human needs

The previous section shows that the arrival of the mega project of Syrah Resources has not ensured social equity for the relatively remote and underdeveloped Balama District due to insufficient public participation, accompanying negative socio-economic implications and inadequate compensation. The next section analyses and maps the socio-economic development needs of the local population and the commitment of the mining company to enhancing it. By identifying these, it can be determined what the socio-economic development of the locals since the establishment of the company has been.

### *Local livelihood enhancement*

#### Local development needs

In its Social Impact Assessment report (SIA), the company has identified the social needs of the inhabitants of the project affected communities in order to have an overview of how the project can contribute to community upliftment programmes. The following components are covered by the identified socio-economic development needs: local employment, training and skills education, infrastructure development of the local area, building and renovating schools, building a health clinic, building and renovating wells and supporting local football clubs. What is striking from this enumeration of what the company considers to be "socio-economic needs" is that, roughly speaking, the local communities' perception is that these are promises that the company, in their eyes, has not yet fulfilled or has fulfilled poorly. As described earlier, the difference in perspective between the local residents and the company regarding these 'promises' or 'needs' results in incomprehension, dissatisfaction and a feeling of being cheated by the company. CTV, the civil society organisation heavily involved in the project, says that everything revolves around expectations: *“The expectation when we talk about resettlement, especially when people hear about resettlements from other places, people have expectations of receiving high values and when in practice it is the opposite, the expectations are frustrated*

*and then people conclude that the process was not well conducted.*” In the case of Syrah Resources’ project, this observation by CTV is widely applicable. As the analysis shows, many local residents are not satisfied with the support and development packages provided by the company. One resident from Nanhupo says the following about his perception on the local development contribution of the graphite company: *“Syrah has not helped at all except exploiting people's machambas and in giving no help.”* (interviewee 10, Nanhupo). Two factors have been identified as giving rise to this problematic difference between the company's commitment to local development and the degree to which the local communities are satisfied with it. First of all, expectations and needs of the local communities change over time. According to CTV, initially, the local communities had a strong need to be advised on the course of the resettlement process to ensure that it will be conducted in the best way possible. Over time, that need would have changed and communities would have needed other things such as local employment, access to education, better healthcare services, etc. CTV's consideration is in line with our observation that the needs of local residents are changeable and very diverse, as evidenced by the requesting statements of local residents, spanning from repairing the provincial roads, bringing electricity, building houses to constructing mobile phone antennas. The second factor is the alignment of the local development needs between residents of local communities. As the following accounts of Syrah's planned construction of a bridge for the purpose of local infrastructure development shows, differing views on what is needed resulted in counterproductive outcomes: *“I heard about the construction of the bridge, and I wondered why the people who were weeding there did not give up the space so that they [Syrah] could build the bridge and we could cross over to the fields. Not only that, if they asked for little money [referring to the large amount of money that was demanded by the owners of the area] they could have given us a bridge and today we would be crossing a comfortable bridge”* (interviewee 11, Nacole). And: *“[...] it wasn't built, and we were waiting for the bridge because the river is bigger now and we can't handle it. We have been trying to put stilts for the crossing, but they fall into the river. If it had been built it would make a lot of people happy because it would help us transport our agricultural produce.”* (interviewee 5, Nacole). From the fact that local development needs change and are so diverse, and with the lack of coordination among local residents, it can be concluded that these factors make it difficult for the company to substantiate its commitment to local development. Which in turn leads to dissatisfaction among the local population.



### *Local employment*

One of the most pressing need from the local community that is evident both from the interview data from the local communities and from the interview with the company's former social officer is local employment. The need for local employment is best reflected in the expression of desires when asked if the local participants wanted to add anything to the interview. What is notable is that, regardless of the negative experiences due to the existence of the mining company, the local residents still want the company to continue its operations. Getting a job appears to be the main reason for this. The income that the local residents now lose by both losing their land and being without work causes a lot of suffering: *“just ask them to put us back to work so that we can also be humans, they have taken our fields and we are suffering, so let them give us work”* (Interviewee 21, Ntete). And: *“our will is that that company should remain, and only then would they reduce our suffering.”* (Interviewee 3, Pirira). Syrah has recognised this need and has even made concrete commitments to the host communities on this matter. The company is said to have committed itself to creating as many local employment opportunities as possible in order to contribute to the local development of the host communities. The former social officer says the following about this: *“What I can remember in terms of promises is that there were promises made in terms of employment, that we will try to hire local people. That was one of the major expectations and be honest to you, Syrah did make a great effort to miss that expectation.”* The problem with this commitment is that it could not be fully realised because the local communities did not have the right skills to carry out the specialised work: *“the major problem with the local employment plan was that most of the local people did not have the required skills for the skilled positions. In the same way you don't turn a farmer into a machine operator in a blink of an eye.”* The promise to use as much local labour as possible for the operations of the graphite mine has therefore not been kept. This while local employment could potentially have been the company's biggest local development contribution as people who have worked there generally report having experienced significant improvement in terms of their socio-economic development.

### *Socio-economic development as a result of employment*

The local residents who did manage to get a job at the mining company generally report a socio-economic development during their employment. While working at the mining company, the workers have been able to make various purchases that they could not have afforded without this work. For example, farmers report that the money has enabled them to enlarge and renovate

their houses such as to improve the roof of their house by attaching corrugated zinc sheets. Others report being able to buy a motorbike which has improved their mobility, and still others have been able to buy a grinding mill to process the crops they harvest right away. It is noteworthy that farmers who have had many negative experiences from losing their land to the land acquisition process but still managed to work for the company report a socio-economic development. A local resident of the village of Nacole outlines what the company's arrival has meant for local developments *“previously we used to live in suffering because we did not know what it is to work to and to earn money, our life consisted only of weeding and producing cotton. After the company came about things have changed because people working there have managed to make houses out of zinc sheets, it has evolved the local trade, we have a hospital now and a school under construction and for all this we are grateful because Nacole is developing.”* (Interviewee 5, Nacole). Another resident of Pirira states that the combination of income from working for Syrah and the earnings from the land together enables him to satisfy the needs of his family: *“And I always gave part of my money to my wife to be helped in the machamba and I also helped the other members of the family. I managed to buy a motorbike, but it was all because I used to get together my salary and the value of the produce from the field when we sold it, and only in this way could I meet my own and the family's needs.”* (Interviewee 1, Pirira). Unfortunately, this contribution of the company did not last long for the local communities as will be shown in the next section.

### *Consequences of redundancy waves*

It did not take long for the first wave of redundancies to occur at Syrah Resources. Two waves of dismissals were identified on the basis of the data analysis. On the first wave of dismissals, the former social officer says the following: *“But unfortunately, later on when I left the project, graphite was no longer in high demand as expected, and then production failed. Jobs opportunities disappeared, people sent home. Those are the cycles, you know, the process cycles of mineral resources. Unfortunately, it affected lots of Mozambicans in terms of employment”*. It did not take long after that when a large proportion of the employees were laid off in the second wave of redundancies due to the global outbreak of the COVID-19 virus. The main reason given by the company for the redundancies was again the decline in the market value of graphite. With the company's promises that the mine will operate for a long time and that in the event of termination of employment due to illness or death, family members could take over, many dared to give up their farming activities in change for employment at the mine:

*“They had said the work would be for 50 years, if someone died or retired their son would take his place to work”* (interviewee 1, Ntete). But that would later prove to be a mistake for the local communities: *“When the company came and called us to work, many colleagues relaxed, they abandoned their farms and trusted the work.”* And *“that company is not to be trusted, today you work there but in one or two months you are already expelled, whereas initially they said that our contracts were indefinite, we trusted them but suddenly they expel us, and we are left without doing anything and without knowing what to do.”* (Interviewee 10, Marica).

The vulnerability and difficult situation that the workers found themselves in after the waves of redundancy becomes clear when we analyse the consequences. During the employment phase of the workers from the local communities, Syrah encouraged the workers to apply for a bank loan so that they would have the means to develop their livelihoods. The workers' self-confidence in the belief that their work was indeed guaranteed for the long term, many used their employment contract to apply for the loan in order to use it to improve their lives: *“they said lend money because this job won't end so soon.”* (Interviewee 7, Pirira). And then the first wave of redundancies began: *“There were 272 of us who had left because the graphite business was not doing well. When the product came up for sale, the price had gone down. That's the explanation we got, and they said as soon as they got back to normal, they would call us.”* (Interviewee 7, Balama town). The workers were compensated for their dismissal, but since they were encouraged to apply for a loan from the bank, nothing was left over from a financial compensation: *“[...] there was loan provided by working for the company and people were fired without having paid the debt and that prevented them from receiving the compensation.”* (Interviewee 9, Balama town). This means that workers who have been made redundant are not only unable to repay their debts but are also deprived of using the redundancy money they have received to sustain their livelihood. It can therefore be concluded that the livelihood of these individuals, taking into account that they also lost their primary source of livelihood - their agricultural land - to the company, has not exactly improved. The following is said about it: *“... our biggest regret was on that issue of the machambas, the workers being expelled empty handed.”* (Interviewee 11, Pirira) and: *“[...] we took that money trusting that we would work for much longer only to find out that it was a trap.”* (Interviewee 5, Pirira).

### 5.3 Respecting environmental limits

The following section deals with the environmental impacts that local residents report having experienced. After the mapping of the findings, a statement was made about factors that could explain the occurrence of these environmental impacts.

#### *Consequences of deforestation and dust*

For the local community, it is much more difficult to assess the environmental impacts resulting from the operation of the mining company. Nevertheless, they claim to experience environmental impacts that they did not experience before the presence of the graphite mine. For example, residents have noticed that the wind has become stronger in recent years. The blowing of the dust coming from the mine is said to have been intensified by the fact that the company has also cut down many trees: *“there is a lot of dust here, the experts say that it is because there are no more trees to stop it because a lot of trees have been cut down.”* (Interviewee 8, Ntete) and: *“there is a lot of wind, which produce a lot of dust. When we put our products to dry in the courtyard, everything gets dirty from dust, but all this is because there are no more trees to defend us.”* (Interviewee 9, Ntete). Deforestation is said to have increased further after many residents lost their land to the company and looked elsewhere for agricultural land: *“when they took the fields there in that place people went to other areas to make fields and cut down trees and bamboo.”* (Interviewee 7, Ntete). During the temporary halt of the mining company's operations, the dust nuisance is said to have increased. According to a resident of Ntete, this can be explained by the following: *“... now that they are not working they don't wet the ground like they used to during the work. This leads to a lot of dust which gets to the community. You did well to come here with a mask, because besides the coronavirus you are avoiding inhaling graphite.”* (Interviewee 1, Ntete).

The local population has been warned by the mining company about the harmful effects of dust from the graphite extraction. The situation is worrying, and the residents are also expressing their indignation: *“When they dig and generate dust, we get sick here because we breathe the graphite dust. They themselves said that diseases can occur here because of the dust and that is why we do not understand why the company came here in the first place, because we are actually getting sick.”* (Interviewee 4, Ntete). The government official tried to downplay the problem for the local communities as they were considered to be unaffected as graphite dust is very light and the wind blows it away to more distant villages. Not only do the local residents

refute this claim, but they also indicate that their harvested crops are suffering from the dust that is affecting the agricultural production in the local area. The dust would blow up and land on the crops, rendering them unsuitable for consumption, thus jeopardising local food security: *“our production in the field suffer because it is totally covered with graphite because of the dust, our beans become dark, if we leave flour to dry it becomes all dark and they said that graphite causes health problems, and we have already consumed it.”* (Interviewee 10, Ntete).

### *Floods*

Floods are a major problem in the area surrounding the mine. The problem leads to various negative consequences. The cause of the floods is blamed on the mining company. Local residents report that during rainy days, water is released from the company's dams, which then negatively impacts the agricultural produce of local farmers because of floods: *“When it rains they release water from their dams and this water comes here, which caused crops to rot that we had grown between the sides of the road that goes to the company while we trusted these fields. As a result, all the fields have gone bad.”* (Interviewee 4, Pirira). Another resident reports that these floods were caused by a water diversion that had been routed in the direction of the village of Pirira: *“But when there was no mining company we used to grow corn, maize, cotton and even with heavy rain the water never destroyed our crops, but today the company has covered the water path diverting it to where we live and practice our activities.”* (interviewee 10, Pirira). The consequences of this are huge. In addition to a major impact on local food production, the flood also destroys homes and creates a sense of fear among local residents: *“when they open it, that water that comes out of there, it mixes with the water that stays here as a result of the rain and then it becomes such a big quantity of water that we get scared.”* (Interviewee 11, Pirira). It also affects the existing local roads, which remain wet from the floods and are damaged by the continued use of these roads by the mining company's heavy machinery and vehicles. The large vehicles leave holes in the roads they drive on because they get stuck in the unpaved wet roads. When the vehicles are then pulled out, they leave large holes which then fill with water leading to further erosion.

### *Water pollution*

Finally, the local communities are also negatively affected by water pollution. This problem has a dual cause. Firstly, it is caused by windblown dust from the graphite mining activities, as described earlier. When the wind blows this dust up, it ends up in the water supplies of the local

communities, such as wells. Secondly, the flooding causes contamination of the water because it mixes with the local water supplies. The company is aware of this and sends researchers to assess the water quality. A local resident says the following about this: *“They have polluted our water, yes, because we have a well which we use, but the water that comes from the company enters the same well and it ruins all the water and we can't drink it. Here we have a well that was not made by them, but they have come to take a sample of the water and take it for laboratory analysis and we don't know what they do with it.”* (Interviewee 4, Pirira). Employees of the mining company have constructed water fountains, but even these, after inspection, would not be suitable to be used as drinking water: *“First they made four fountains, but they said that they were not doing well, they dismantled them saying that the water was not good, it was full of graphite. And then we asked ourselves, why are they removing it if we are the ones who are going to drink the water? And they didn't say anything.”* (Interviewee 8, Pirira).

Unfortunately, it is not surprising that such projects have an impact on the environment, as already discussed in the literature section of this thesis. In that respect, this project has only shown more of the same. However, it does not mean that these impacts cannot be prevented. Syrah's former social officer also acknowledges this by stating that: *“You know, companies will only tend to comply to what is the legislation in the country where they operate [...] I remember talking to some of my colleagues in Balama saying in Australia, for environmental assets to be approved it can take up to 12 years. But in Mozambique it is only a one-year process to have the environmental license to be approved. Something is wrong there.”* From this it can be understood that while companies like Syrah comply with legislation in the places where they operate, the problem lies with the implementation of that legislation which is inadequate causing impacts on the environment but also on people. Again, the lack of government resources and qualified people as argued in section 5.1 plays a role here, leading to inadequate processes such as the environmental licensing process mentioned by the former social officer. From this it can be understood that while companies like Syrah comply with legislation in the places where they operate, the problem lies with the implementation of that legislation which is inadequate causing impacts on the environment but also on people. Again, the lack of government resources and qualified people as argued in section 5.1 plays a role here, leading to inadequate processes such as the environmental licensing process mentioned by the former social officer.

## Chapter 6. Discussion

### Academic implications

All in all, these findings show that Syrah Resources and its operations have a difficult understanding of the concept of sustainable development. Despite stated objectives of achieving local sustainable development and preventing or minimising socio-economic and environmental impacts, the findings of this thesis show that even projects driven by the sustainability ambition struggle to meet this major challenge. In order to map the socio-economic and environmental impacts of Syrah Resources and to explore factors that explain these impacts, we used the Sustainable Development Imperatives model for this study. In particular, this study demonstrated the value of using the Sustainable Development Imperatives model. The great value of the SDI model lies in its clear definition and interpretation of what sustainable development is. As described in the theoretical framework, the model was created as a response to other models and interpretations of sustainable development that have become weak, vague and meaningless due to the lack of theoretical foundation (Holden et al., 2017). This observation is also reflected in the findings of this study. This has been particularly the case during the assessment of how the company relates to satisfying human needs. The findings show that the company's definition of sustainable development is also vague and meaningless. Leaving the interpretation of sustainable development at the discretion of the company has shown that this is the main cause for the emergence of large disparities between the local communities' development needs and the company's commitment. In addition, the findings on the socio-economic and environmental impacts induced by the graphite company showed, as expected and described in the literature review of this study (Al Rawashdeh et al., 2016; Kitula, 2006), that despite a commitment to (local) sustainable development, this is far from being achieved for the intended recipient.

### Social implications

As described in the introduction, the purpose of this research was not to undermine the global sustainability ambitions but to critically examine the implications of projects that it brings about. Very briefly, this research found that sustainability driven green mineral mining brings about major negative changes for people, the economy and for the environment because it fails to align its operations with ensuring social equity, satisfying human needs and respecting environmental limits. With the acceleration of the sustainability transition in the coming years, it is expected that similar projects will increasingly be found elsewhere in the world. All driven

to contribute to the global sustainability ambition. The question is not whether the world should continue the sustainability transition, but at what cost? The coming years of transition will have to make this clear, but this study has in any case revealed that large social and environmental costs are indeed being made.

## Research limitations

Although this research has made interesting contributions on new frontiers of extraction and how they relate to sustainable development, there have also been some research limitations encountered during the study that have partly influenced the research, these limitations are outlined in this section.

First of all, it has been noted that certain nuances of the local context and statements made by local residents of the host communities have been lost in the translation process. The translation process into English was necessary since, as a researcher, I do not master the Portuguese language. It has also been noted that what was warned about in the methodology chapter has unfortunately emerged in the interviews, namely social desirability answers. The analysis of the community interviews showed that some respondents were careful in formulating their statements about the impacts they experienced. Others do so clearly and even ask whether the answers they have given are good enough. Take, for example, the following respondent who was afraid that he had been tricked after the interview: "What is the purpose of all these questions, is it not to trap us? (Interviewee 9, Balama Town). Despite the fact that respondents were repeatedly told that the data would be processed anonymously, some respondents might still be afraid that their answers would be used for wrong purposes. As explained earlier, due to the outbreak of the global Covid-19 virus, it was not possible to travel to Mozambique to carry out fieldwork research and conduct interviews with the local population ourselves. A few implications have arisen as a result. First of all, nuances that stand out during physical interviews about the emotion of the participants fall away. This made it difficult to properly interpret some of the statements made by participants. Secondly, not being able to travel has meant that I, as a researcher, do not have a clear picture of the local context. This may have influenced the results, since a clear picture of the local context was important for a number of findings. As a solution, I was able to ask the field researchers for clarification at all times, which could take away many of these problems. Finally, it was noted that it was more difficult to collect the secondary data than initially thought. Syrah regularly posts sustainability updates on



their websites and their main policy documents are published online, but I was only able to obtain the more substantive reports such as the Resettlement Action Plan and Social Impact Assessment after requesting them. Because I am dependent on the goodwill of the company to obtain these documents, it is also possible that this has resulted in the omission of some documents that I have never been able to access and analyse, which could be a potential data collection bias.

## Chapter 7. Conclusion

The research aim of this thesis was to analyse the socio-economic and environmental impacts of a new frontier of extraction opened up by the global sustainability ambition. As made clear at the outset this thesis, the main objective of this thesis was not merely to measure the impacts of the extractive industry, but rather to understand how global sustainability-induced extractive projects that are supposed to contribute to sustainable development fail to do so by identifying factors that lead to these apparent sustainability paradoxes. Drawing on analysed data from the operations of one of the world's largest graphite mines, the Australian company Syrah Resources, in the context of the Mozambican province of Cabo Delgado, the following research question is answered:

*How does the new extraction frontier of graphite mining in the Mozambican province of Cabo Delgado relate to the three imperatives of sustainable development?*

To answer this research question, a qualitative case study research was conducted and primary data from 97 semi-structured in-depth interviews with local residents from the host communities supplemented by key informant interviews with the Mozambican government, the locally operating CSO, Syrah's former social officer and secondary data have been used to inform the research. The primary data analysis consisting of previously interviewed residents of 9 local communities in the Balama district have enabled this research to assess the socio-economic and environmental impacts that Syrah Resources has on the host communities' livelihood and local development. The complementary data consisting of key informant interviews and secondary data helped in triangulating the findings from the community interviews and in understanding how the sustainability paradox arises which in turn enabled the identification of factors that give rise to the impacts.

To clarify how the mining company relates to sustainable development, the sustainable development imperatives approach was applied. This approach was chosen because of its socio-economic, political and ecological theoretical understanding of sustainable development. Studying key processes of the mining company have highlighted how the company relates to ensuring social equity for the local communities, satisfying their human needs and respecting the local environment. The findings show that although the company aims to contribute to the

sustainable development of the environment in which it operates, it does not succeed in this objective.

With regard to ensuring social equity, the findings stress the importance of good public participation that does not stop at inclusiveness but also ensures that the participating parties actually have a voice in the process, because only then can one speak of a fairly conducted process. The findings indicate that this process has not achieved the company's intended result of ensuring that everyone has the necessary plans and information to be able to voice their opinions. This is evidenced by reported frustrations with an allegedly non-influenceable process and statements of fears of repercussions. In relation to the socio-economic impacts, economic displacement is the main driver in causing major impacts on local communities in terms of food security, impacted livelihood strategies, impact on the availability of local resources and outward migration of individuals seeking their fortunes elsewhere. It has been argued that these effects can be explained by looking at the role of the government in facilitating - perhaps unintentionally - factors that lead to this. The findings show that this can indeed be explained by three factors, namely the weakness of Mozambican legislation, other government priorities aimed at creating an attractive business environment, and a lack of resources and expertise to manage this type of projects. One of the ways in which Syrah Resources seeks to address social equity is through its attempts to compensate farmers through financial and land compensation packages, but this has not led to the desired outcome. Firstly, because the compensation packages are nowhere near commensurate with what the farmers have had to endure and lose, and secondly, because the farmers are still worse off with the compensation packages than before. As shown, this can be explained by the relatively weak bargaining power of the local communities. Also, the contradictory incentives that the company receives from the government cause the affected communities to be insufficiently compensated. Another way in which Syrah Resources has attempted to ensure social equity in their operations is by setting up a grievance mechanism through which local residents can speak out against the negative consequences they face from the company's presence. However, as the findings have indicated, in practice the mechanism does not work as it should because of the inability of the mechanism to address the biggest grief impact, that being the loss of land, because local residents are afraid to speak out and because the slow process irritates local communities, discouraging them from using the mechanism.

To understand how Syrah contributes to satisfying human needs, the socio-economic development needs of the local communities and the way the company meets those needs have been analysed in chapter 5.2. It was found that there is a perception difference between what the company calls the socio-economic development needs of the local communities and what the local people perceive as development promises made. This difference explains why the attitude of the host communities was initially accommodating towards the plans of the mining company. However, following the establishment of the company and the failure to deliver on these perceived promises, the local communities in general have been left with the feeling of being cheated. This feeling, combined with a general dissatisfaction with the company's contribution to local development, creates a problematic relationship between the two parties. It is shown that this situation is the result of two factors. Firstly, the needs of local residents change over time and secondly, there is a lack of coordination among locals with regard to local development needs. These factors explain why it is a major challenge for the company to achieve local development and keep the local communities satisfied. One commitment that the company has made publicly concerns local employment. As the findings show, Syrah was unable to fully deliver on this commitment because, according to them, there was not enough skilled labour in the local communities. However, those who did manage to work for Syrah generally reported positive socio-economic developments. But it was not long before two waves of layoffs followed due to a decline in the market value of graphite and as a result of the Covid-19 outbreak. The redundancies had a negative impact because many local workers took out loans at the suggestion of the company, which they find difficult to repay in their present circumstances due to the loss of their jobs and land.

Finally, the findings of Chapter 5.3 have shown how the company relates to respecting local environmental limits. The findings show that the arrival of the mine has had harmful environmental effects on the local population and the environment. Firstly, the establishment of the mine has caused local land scarcity, forcing farmers to clear new land elsewhere. This process has led to deforestation, which in turn, according to local residents, has resulted in increased levels of wind that carry the harmful dust from the graphite mine into local communities. The dust is harmful to humans and animals, as well as to crops and drinking water. Local residents also claim to suffer from flooding as a result of the mine's activities. It is clear how these effects arise, but also how they could have been prevented. Once again, the lack of government resources and expertise is identified as a determining factor.

## Policy recommendations and further research

In view of the increasing concretisation of the global sustainability ambitions and the concomitant opening of comparable sustainability-driven frontiers worldwide, contradictions in the achievement of genuine sustainable development – development that is founded on moral, political and ecological principles e.g. ensuring social equity, satisfying human needs and respecting environmental limits – can be expected to persist. It is therefore essential, as a research field characterised by its eagerness to tackle sustainable development issues, to continue to critically examine the shortcomings of sustainability, as similar problematic and contradictory cases are likely to follow the acceleration of the transition in the years to come. Not to undermine the sustainability transition, but rather to steer it in the right direction so that it brings sustainable development where it is most needed. Based on this prospect and the evidence from the findings of this study, it is appropriate to make policy and further research recommendations to ensure that the implementation of similar projects in the future will be improved, thereby making a greater contribution to local development.

First of all, with regard to the probably unintentional facilitating attitude of the Mozambican government in relation to the impacts created, this can be prevented by bringing the current outdated mining legislation in line with the latest extraction boom developments in the country. As the problem is not limited to strong legislation but extends to having the right means to ensure compliance through adequate monitoring and inspections, this is of great importance. Of course, this is easier said than done for a developing country that naturally suffers from capacity shortages, which is why the second policy recommendation is geared towards prioritising the sustainable development goals that have a potential role to play in addressing this problem. In particular, Goal 17 "Partnerships for the Goals" and Indicator 17.9 "Capacity Building", which calls for: "Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the sustainable development goals, including through North-South, South-South and triangular cooperation" (United Nations, 2015). As the sustainability transition is a global task, it is of utmost importance that wealthier countries help Mozambique in this regard.

Although this study has briefly highlighted how the global covid-19 pandemic and the natural disasters that Mozambique regularly faces are having a further deteriorating impact on local communities, more detailed attention could have been paid to the intersection of these and other phenomena that characterise Cabo Delgado. For practical research reasons, it was decided to

limit the scope of the study to the direct impacts that Syrah Resources brings to the region. Since the intersection of these phenomena offers potentially interesting and valuable findings to better understand the contextual factors of such frontiers of extraction, it is recommended to do more research on this aspect.

## References

- Al Rawashdeh, R., Campbell, G., & Titi, A. (2016). The socio-economic impacts of mining on local communities: The case of Jordan. *The Extractive Industries and Society*, 3(2), 494–507. <https://doi.org/doi:10.1016/j.exis.2016.02.001>
- Anderson, E. J. (2012). *What does Hydrocarbon Wealth mean for Foreign Aid in Mozambique?* SAIIA. Retrieved from SAIIA website: <https://saiia.org.za/research/what-does-hydrocarbon-wealth-mean-for-foreign-aid-in-mozambique/>
- Baez, J. E., Caruso, G., & Pullabhotla, H. (2018). *Who Wins and Who Loses from Staple Food Price Spikes? Welfare Implications for Mozambique* (Working Paper No. 8712). World Bank Group. Retrieved from World Bank Group website: <https://documents1.worldbank.org/curated/en/323001539354782668/pdf/WPS8612.pdf>
- BBC. (2020, December 18). *Mozambique's Islamist insurgency: UN warns of rising violence in Cabo Delgado*. Retrieved from <https://www.bbc.com/news/world-africa-55348896?xtor=AL-72-%5Bpartner%5D-%5Binforadio%5D-%5Bheadline%5D-%5Bnews%5D-%5Bbizdev%5D-%5Bisapi%5D>
- Bernstein, S. (2001). *The Compromise of Liberal Environmentalism* (1st ed.). New York: Columbia University Press.
- Blumer, H. (1954). What is Wrong with Social Theory? *American Sociological Review*, 19, 3–10.
- Bryman, A. (2016). *Social research methods*. Oxford, United Kingdom: Oxford University Press.
- Buchholz, P. (2018). Demand, Supply, and Price Trends for Mineral Raw Materials Relevant to the Renewable Energy Transition Wind Energy, Solar Photovoltaic Energy, and Energy Storage. *Chemie Ingenieur Technik*, 90(1–2), 141–153. <https://doi-org.proxy.library.uu.nl/10.1002/cite.201700098>
- Buur, L., & Monjane, C. (2017). Elite capture and the development of natural resource linkages in Mozambique. *Fairness and Justice in Natural Resource Politics*, 200–217.
- Centro Terra Viva. (2020). História Centro Terra Viva. Retrieved from <https://ctv.org.mz/quem-somos/centro-terra-viva/>
- Church, C., & Crawford, A. (2018). *Green Conflict Minerals: The fuels of conflict in the transition to a low-carbon economy* [Report]. International Institute for Sustainable

- Development. Retrieved from International Institute for Sustainable Development website: <https://www.iisd.org/system/files/publications/green-conflict-minerals.pdf>
- Creswell, J. W. (2014). *research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). CA: Thousand Oaks: SAGE publications.
- Derlukiewicz, N. (2014). Development of Smart and Sustainable Economy in the European Union. *European Journal of Sustainable Development*, 3(4), 151–162. <https://doi.org/Doi: 10.14207/ejsd.2014.v3n4p151>
- Friedmann, J. (1996). Borders, Margins and Frontiers: Myth and Metaphor. In Y. Gradus & H. Lithwick (Eds.), *Frontiers in Regional Development* (pp. 1–20). MD: Maryland: Rowman & Littlefield International Ltd.
- Geiger, D. (2009). *Turner in the Tropics: The frontier concept Revisited*. Universität Luzern, Luzern.
- Hahn, T., Figge, F., & Pinkse, J. (2018). A Paradox Perspective on Corporate Sustainability: Descriptive, Instrumental, and Normative Aspects. *Journal of Business Ethics*, 148, 235–248. <https://doi.org/10.1007/s10551-017-3587-2>
- Hanlon, J. (2013). *Mozambique political process bulletin* [Bulletin]. CIP and AWEPA. Retrieved from CIP and AWEPA website: [https://www.open.ac.uk/technology/mozambique/sites/www.open.ac.uk.technology.mozambique/files/files/Mozambique\\_Bulletin\\_53\\_coal-gas.pdf](https://www.open.ac.uk/technology/mozambique/sites/www.open.ac.uk.technology.mozambique/files/files/Mozambique_Bulletin_53_coal-gas.pdf)
- Hanss, D., & Böhm, G. (2011). Sustainability seen from the perspective of consumers. , 36(6), 678–687. Doi:10.1111/j.1470-6431.2011.01045.x. *International Journal of Consumer Studies*, 36(6), 678–687. <https://doi.org/doi:10.1111/j.1470-6431.2011.01045.x>
- Hennink, M., Hutter, I., & Bailey, A. (2020). *Qualitative research methods* (2nd ed.). London, United Kingdom: SAGE publications.
- Hilson, G. (2012). Corporate Social Responsibility in the extractive industries: Experiences from developing countries. *School of Agriculture, Policy and Development*, 37(2), 131–137. <https://doi.org/doi:10.1016/j.resourpol.2012.01.002>
- Holden, E., Linnerud, K., & Banister, D. (2017). The imperatives of sustainable development. *Sustainable Development*, 25(3), 213–226. <https://doi-org.proxy.library.uu.nl/10.1002/sd.1647>
- International Finance Corporation. (2002). *Handbook for Preparing a RAP*. Retrieved from [https://www.ifc.org/wps/wcm/connect/topics\\_ext\\_content/ifc\\_external\\_corporate\\_site/sustainability-at-ifc/publications/publications\\_handbook\\_rap\\_wci\\_1319577659424](https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_handbook_rap_wci_1319577659424)



- International Growth Centre. (2020). Poverty eradication in Mozambique: Progress and challenges amid COVID-19. Retrieved from <https://www.theigc.org/blog/poverty-eradication-in-mozambique-progress-and-challenges-amid-covid-19/>
- Jolly, R. (1976). The World Employment Conference: The Enthronement of Basic Needs. *Development Policy Review*, *A9(2)*, 31–44. <https://doi.org/doi:10.1111/j.1467-7679.1976.tb00338.x>
- Jones, T. M. (1980). Corporate Social Responsibility revisited, redefined. *Management Review*, *22*, 59–67.
- Kitula, A. G. N. (2006). The environmental and socio-economic impacts of mining on local livelihoods in Tanzania: A case study of Geita District. *Journal of Cleaner Production*, *14(3–4)*, 405–414. <https://doi.org/doi:10.1016/j.jclepro.2004.01.012>
- Krstić, I. I., Ilić, A., & Acramović, D. (2018, December 6). *The three dimensions of sustainable development: Environment, economy and society*. Presented at the 50 Years of Higher Education, Science and Research in Occupational Safety Engineering, Nis, Serbia.
- Macuane, J. J., Buur, L., & Monjane, C. M. (2018). Power, conflict and natural resources: The Mozambican crisis revisited. *African Affairs*, *117(468)*, 415–438.
- Newitt, M. (2017). *A Short History of Mozambique*. New York: Oxford University Press.
- Niklasson, L. (2019). *Improving the Sustainable Development Goals* (1st ed.). London, United Kingdom: Routledge.
- Rankin, W. J. (2011). *Minerals, Metals and Sustainability: Meeting Future Material Needs*. Clayton, Australia: CSIRO Publishing.
- Rawls, J. (1971). *A theory of justice*. Cambridge, MA: Harvard University Press.
- Reuters. (2019, April 15). *Cyclone Idai's death toll over 1,000, hundreds of thousands displaced*. Retrieved from <https://www.reuters.com/article/us-africa-cyclone-toll-idUSKCN1RR0NA>
- Rockström, J. (2009). A safe operating space for humanity. *Nature*, *461(24)*, 472–475.
- Rogers, P. P., Jalal, K. F., & Boyd, J. A. (2008). *An Introduction to Sustainable Development*. London, United Kingdom: Earthscan.
- Romero, H. (2012). Mining Development and Environmental Injustice in the Atacama Desert of Northern Chile. *Environmental Justice*, *5(2)*, 70–76. <https://doi.org/10.1089/env.2011.0017>
- Sachs, J. D. (2015). *The Age of Sustainable Development* (4th ed.). New York: Columbia University Press.
- Sen, A. (2009). *The Idea of Justice*. London, United Kingdom: Penguin.

- State University. (n.d.). Mozambique: History & Background. Retrieved from <https://education.stateuniversity.com/pages/1027/Mozambique-HISTORY-BACKGROUND.html>
- Steffen, W., Richardson, K., Rockström, J., Cornell, S., & Fetzer, I. (2015). Planetary boundaries: Guiding human development on a changing planet. *Science*, 347, 736–746.
- Symons, K. (2016). Transnational spaces, hybrid governance and civil society contestation in Mozambique’s gas boom. *The Extractive Industries and Society*, 3(1), 149–159. <https://doi.org/10.1016/j.exis.2015.11.002>
- Syrah Resources. (2014a). *Public participation process report*.
- Syrah Resources. (2014b). *Resettlement Action Plan*. Syrah Resources.
- Syrah Resources. (2014c). *Social impact assessment: The Balama graphite mine Cabo Delgado Province District of Balama* [Social Impact Assessment]. Coastal and Environmental Services Mozambique Limitada.
- Syrah Resources. (2016). *Local Employment Management Plan* (No. 0.2; pp. 1–7).
- Syrah Resources. (2021). *Sustainability Update Q1 2021* [Quarterly Update Report]. Retrieved from <http://www.syrahresources.com.au/sustainability-reports>
- Syrah Resources. (n.d.). Balama Graphite Operation. Retrieved from <http://www.syrahresources.com.au/balama-project>
- Turner, F. J. (1893). *THE SIGNIFICANCE OF THE FRONTIER IN AMERICAN HISTORY*.
- UN News. (2021a, January 20). ‘Complex’ emergency unfolding in Mozambique’s Cabo Delgado, warn UN agencies. Retrieved from <https://news.un.org/en/story/2021/01/1082552>
- UN News. (2021b, January 26). Mozambique: UN responds as thousands are caught in the wake of devastating Cyclone Eloise. Retrieved from <https://news.un.org/en/story/2021/01/1082972>
- UNICEF. (n.d.). Cyclone Idai and Kenneth. Retrieved from <https://www.unicef.org/mozambique/en/cyclone-idai-and-kenneth>
- United Nations. (2015). *Sustainable Development Goals: Capacity-building*. Retrieved from <https://sustainabledevelopment.un.org/topics/capacity-building>
- United Nations Environment Programme. (2000). *Mining and sustainable development II Challenges and perspectives*. United Nations. Retrieved from United Nations website: <http://www.unep.org/media/review/vol23si/unep23.pdf>
- Utting, P. (2005). Corporate responsibility and the movement of business. *Development in Practice*, 15(3–4), 375–388.

- Vines, A., Thompson, H., Jensen, S. K., & Azevedo-Harman, E. (2015). *Mozambique to 2018 Managers, Mediators and Magnates*. Chatham House. Retrieved from Chatham House website:  
[https://www.chathamhouse.org/sites/default/files/field/field\\_document/20150622Mozambique2018VinesThompsonKirkJensenAzevedoHarman.pdf](https://www.chathamhouse.org/sites/default/files/field/field_document/20150622Mozambique2018VinesThompsonKirkJensenAzevedoHarman.pdf)
- Vollmer, F. (2013). The Changing Face of Africa: Mozambique's Economic Transformation and its Implications for Aid Harmonisation. *Royal Irish Academy*, 24, 137–164.  
<https://doi.org/doi:10.3318/ISI.A.2013.24.6>
- Wappelhorst, S. (2020, November 11). Growing momentum: Global overview of government targets for phasing out sales of new internal combustion engine vehicles [Blog post]. Retrieved from <https://theicct.org/blog/staff/global-ice-phaseout-nov2020>
- Wiegink, N. (2018). Imagining Booms and Busts: Conflicting Temporalities and the Extraction-“Development” nexus in Mozambique. *The Extractive Industries and Society*, 5(2), 245–252. <https://doi.org/10.1016/j.exis.2018.02.012>
- World Bank. (2019). *Decline of Global Extreme Poverty Continues but Has Slowed: World Bank*. Retrieved from <https://www.worldbank.org/en/news/press-release/2018/09/19/decline-of-global-extreme-poverty-continues-but-has-slowed-world-bank>
- World Bank. (2020). *Climate-Smart Mining: Minerals for Climate Action* [Brief]. World Bank. Retrieved from World Bank website: <https://www.worldbank.org/en/topic/extractiveindustries/brief/climate-smart-mining-minerals-for-climate-action>
- World Bank. (n.d.). *Foreign Direct Investment, net inflows (% of GDP)—Mozambique* [Data]. Retrieved from <https://data.worldbank.org/indicator/BX.KLT.DINV.WD.GD.ZS?locations=MZ>

## Appendix 1: Interview guide local communities

### **The socio-economic and environmental implications of the expanding mining frontier in Cabo Delgado Province, Mozambique**

**Additional questions specifically for the leaders or anyone knowledgeable about the communities:**

#### **Community background**

- By whom, how and when did this community start? E.g. the year it was founded, the person/people who founded it. How was it affected by past wars?
- How has it developed over the years? For instance, how is the leadership structured, how many inhabitants does it have, what do majority of the inhabitants do? How many Bairros does it have? What type of natural resources does it have?
- In relation to graphite mining, how has the community changed before or after graphite mining?

***From here: the following data is recorded in KoboCollect***

Date:

District:

Community:

Mining project:

Interviewer name:

#### **A. Background interviewee and his/her family (demographics and migration histories)**

Name:

Ethnicity:

Gender:

Age:

Livelihood (what do you do for a living?):

***From here: data is recorded using a voice recorder or detailed notes taken (if interviewee declines recording)***

1. Just to know a bit about you and your family, would you describe your household composition for me? Who are you living with? What do they do?
2. For how long have you and your family lived in this community?
  - a) Were you born here? If so, have you lived anywhere else before? Why did you move?

- b) If you were not born here, where were you born? Did you live anywhere else before coming here? Why did you live in that/those place(s)? Why did you come here?
- c) If you have lived elsewhere before, did the movement impact your life in anyway? If so, how?

B. Mining in Cabo Delgado and socio-economic and environmental impacts

- 3. Are you or any of your family members involved in or affected by the mining project? If so, how?
- 4. Has your life changed in any way following the coming of the mining project(s)? If so, how? (e.g. do you need to farm or live elsewhere than you were before, etc.)
- 5. Has your environment (land, water, air, trees, etc.) or your access to any natural resources changed in any way following the coming of the mining project? If so, how?

C. Instability/pandemic/cyclone in the Province

- 6. Insecurity: We have heard about the insecurity within the province. Do you know anything about it? Has it affected you or your family in any way? If so, how?
- 7. Pandemic: There is also news about the Covid-19 pandemic. Do you know anything about it? Has it affected you and your family in anyway? If so, how?
- 8. Cyclone Kenneth: Do you recall the cyclone that hit Cabo Delgado in April last year? Did it affect you or your family in any way? If so, how? How are you or did you cope with its impacts?
- 9. Has there been any other major event(s) within the past say 5 -10 years that has changed your life greatly? If so, what is the event and how did it change your life/livelihood? It can be anything; family, environmental, etc.

D. Other and further information

- 10. Is there any other issue related to the effects of mining on your life, livelihood and environment that you would like to add to our discussion?
- 11. Do you have any questions for us?
- 12. Is there anyone else who is knowledgeable about or experienced with any of the issues we have spoken about that you would recommend we speak to? Can be anyone.

If we need any more information at a later time, can we get in touch with you again? If so, would you provide us with your telephone contact(s)? If you have forgotten anything or need to get in touch with us after the interview, you can call me at xx (interviewers contacts).