Quality of Social Impact Assessment in bauxite mining sector

MASTER THESIS

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June 3rd, 2022

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Title:
Quality of Social Impact Assessment in bauxite mining sector

Education:
Environmental Management and Sustainability Science

Project:
4th semester: Master thesis

Project period:
01/02-2022 - 03/06-2022

Participant:
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Supervisor:
Sara Bjørn Aaen

Report pages: 51
Picture on title page: Inclusive Development International [2019]

Contents

Preface

This study is conducted during the 4th semester of the Master's program Environmental Management and Sustainability Science at Aalborg University in a time period from February 1st to June 3rd.

A special thank you goes for my supervisor Sara Bjørn Aaen for all the help and feedback during this project.

Reading instructions

It is recommended that this report should be read in a chronological order. References that are used in this project are formatted in Harvard style and the list of references is located in page 47.

To guide the reader, a visualisation of the study is located in Chapter 6.1.

List of abbreviations

EA = Environmental Assessment
EIA = Environmental Impact Assessment
EIS = Environmental Impact Statements
ESIA = Environmental and Social Impact Assessment
IA = Impact Assessment
IAI = International Aluminium Institute
IAIA = The International Association for Impact Assessment
Mtpa = Million Tonnes Per Annum
NGOs = Non-governmental organisations
PV= Solar Photovoltaic
SIA = Social Impact Assessment

1 Summary

The demand for aluminium is growing and expected to continue to do so in the next decades. Traditional bauxite alumina mining, on the other hand, is recognised to have a significant environmental and social impact on local communities. As a result, it is critical to identify and manage these consequences. SIA is the most widely used tool for managing the social issues of mine-related operations, however there are doubts about its quality. As a result, a research question was established:

What is the state of quality of Social Impact Assessment in the field of bauxite mining and how to improve it?

Two sub-questions are posed and answered in the study. The first sub-question was intended to look at the SIA quality in the bauxite mining industry. To address this, a conceptual framework for analysing EA reports was created. The investigation is divided into two stages:

Step 1: Analyses of the overall quality of the EAs by screening six EA reports. Recognizing that quality is a holistic notion encompassing a variety of indicators, a quality evaluation based on 20 criteria was conducted.

Step 2: Three cases of varying quality were chosen for analysis of mitigation methods and public participation based on the first screening and knowledge from the literature.

The major findings of Step 1 imply that the general quality of EAs conducted for bauxite mining projects is good, as half of the reviewed reports obtained a good quality score, two received a medium quality score, and one received a poor quality score. However, the screening revealed several aspects of EAs that could be handled better, including proper stakeholder identification, identification of different social groups, description of data collection, early public involvement in project, providing evidence of actually involving the public, carrying out the scoping process, including enhancement measures, establishing grievance mechanisms, and defining clear roles and responsibilities.

Step 2's key findings point to a few distinct concerns that have an impact on EA quality. First, despite anomalies in mitigation measures compared to the mitigation hierarchy, mitigation measures were recommended in all circumstances, and the wording clearly demonstrated commitment to implementation by utilising phrases like "must/have to/will." Second, different commitments to public participation and varied timelines for engaging stakeholders exist. Nonetheless, all examples have involved some form of public input, but with varying degrees of transparency, raising doubts about the assessment's quality and validity, or at the very least, the quality of stakeholder engagement. Furthermore, there appears to be a link between the number of consultations and the

quality of EAs. Also, the findings show that all cases informed and consulted the impacted parties, demonstrating that local knowledge and data were gathered to improve the quality of an EA. As a result, it was determined that simply informing the public is insufficient, and that aiming for a degree of public participation that includes input, such as consultations, is preferable.

Various changes were defined to answer the second sub-question of how to increase the quality of SIAs. First, the document studies show that a well-balanced report with a logical structure and a manageable size can help with the appraisal process. Second, the following actions were suggested to improve quality based on a combination of knowledge from the literature and observations from the analysis: a regulatory push by raising the minimum requirements for a SIA, paying attention to the knowledge and qualifications of the EA practitioner, ensuring that biophysical impacts are not prioritised over social impacts, and including scoping as part of the project.

To answer the second sub-question of how to improve quality of SIAs, various improvements were defined. First, based on the document studies, it can be concluded that a well balanced report with a logical structure and non-extensive size can improve the evaluation process. Second, by combining knowledge from literature and observations from analysis, following actions were suggested to improve quality: a regulatory push by increasing the minimum requirements for an SIA, paying attention to knowledge and qualifications of the EA practitioner, making sure that the biophysical impacts are not favoured over the social impacts and including scoping as a part of the project.

Finally, the study should be enhanced by looking at other quality indicators in more cases and looking into the relationship between quality and efficiency.

2 Introduction

The origins of SIA can be traced back to the United States' National Environmental Policy Act of 1969, although as [Esteves, Franks, and Vanclay, 2012] points out, various authors argue that the consideration of social impacts has been around long before that. Nevertheless, SIA has evolved alongside or "in the shadow" (Du Pisani and Sandham [2006]) of the EIA while, as Du Pisani and Sandham [2006] points out, EIA for many people is viewed as the "mother of all impact assessments". As a result, despite the fact that SIA has been around for decades, it is still a growing subject of study. Nonetheless, with the recent and increased attention to human rights by various international frameworks such as Agenda 21, UN Guiding Principles on Business and Human Rights and Sustainable Development Goals, consideration of social impacts has received a growing amount of attention [Vanclay, 2020; Du Pisani and Sandham, 2006].

SIA can be undertaken for various purposes [IAIA, n.d.]. On the one hand, SIA can be done in a dynamic manner that includes assessing and managing the social repercussions of project development. On the other hand, it can be carried out as a requirement to operate, which often means doing the bare minimum of the demands [Joyce and MacFarlane, 2001]. While there is no single way to conduct a SIA, there are a number of guidelines and standards to follow, including International Principles For Social Impact Assessment, written by Vanclay [2003], IFC Performance Standards on Environmental and Social Sustainability (IFC [2012]) and World Bank's Environmental and Social Standards (World Bank [2016]).

Many diverse industries have used SIA, including the mining industry. For a long time, the mining sector has been associated with neglecting the social consequences of its operations [Kilian, 2008]. This is where SIA comes into play, as it is currently the most widely utilised tool for assessing and managing social issues related to mining-related operations [Joyce and MacFarlane, 2001]. The mining industry is also changing due to the increased attention to discourses of climate action and sustainability and the push to follow the sustainability agenda from the foundation of the International Council on Mining and Metals, as well as the Mining, Minerals and Sustainable Development project [Han Onn and Woodley, 2014].

The bauxite mining sector is likewise evolving and focusing on sustainable development. Companies are reliesing sustainability reports, complying with international standards and updating their websites with essential information for the public. In the IAI [2022] report "Sustainable Bauxite Mining Guidelines" states the intentions of the aluminium industry: *"The aluminium industry's objective is a long-term, sustainable bauxite mining industry with acceptably low social and environmental impacts during operation and post-closure" [IAI, 2022, p. 4]*. Nonetheless, bauxite extraction is recognised to have a significant amount of environmental and social repercussions, owing to the distribution of bauxite, geological factors, and bauxite residue, which highlights the significance of conducting a thorough SIA.

As Vanclay et al. [2015] and Martinez and Komendantova [2020] reveals, the current practice of SIAs is often lacking quality. There are a number of issues in connection to quality, including the different understandings of the concept and the fact that there is a distinct lack of literature regarding the quality of SIAs, particularly in the mining industry. The majority of the scholarly literature on quality is focused on EIAs. As a result, a research question has been established for this study to analyse the status in terms of SIA quality in the bauxite mining sector:

What is the state of quality of Social Impact Assessment in the field of bauxite mining and how to improve it?

A two-step study was used to analyse the problem, with an initial screening of six EA statements to establish their quality, followed by a more in-depth examination of three selected examples, each with a distinct level of quality. The analysis is focused on mitigation measures and public participation within the SIA process.

It should be highlighted that the research is limited to bauxite mines, and more particularly, the mining phase of the mining lifecycle.

The rest of this project is organised as follows. First, it outlines the overriding problem and describes the research that is supporting that (chapter 3) and leads to a problem formulation and the formulation of the research question (chapter 4). Second, it describes the conceptual framework (chapter 5) that explains the key elements of the quality concept. Next, it outlines the methodology (chapter 6) of the work, including the description of research design, analytical approach, case and document studies. Chapter 7 is devoted to analysis of the selected cases and indicators and chapter 8 discusses ways to improve quality of SIAs. The project is finalised by the conclusion in chapter 9.

3 Problem analysis

3.1 Aluminium

Aluminium is a valuable and necessary material for technology with various physiochemical properties such as its lightness, durability, flexibility, impermeability, conductivity and corrosion-resistance [IAI, 2022]. It makes aluminium suitable for numerous applications in different fields such as construction, transportation and electrical sector. The demand for aluminium is expected to rise worldwide for at least half a century [Bagani, Balomenos, and Panias, 2021]. According to IAI [2022] it is partly due to the increase in the demand of primary aluminium from China, which accounts for 60% of global production (see 3.1) [IAI, 2022].

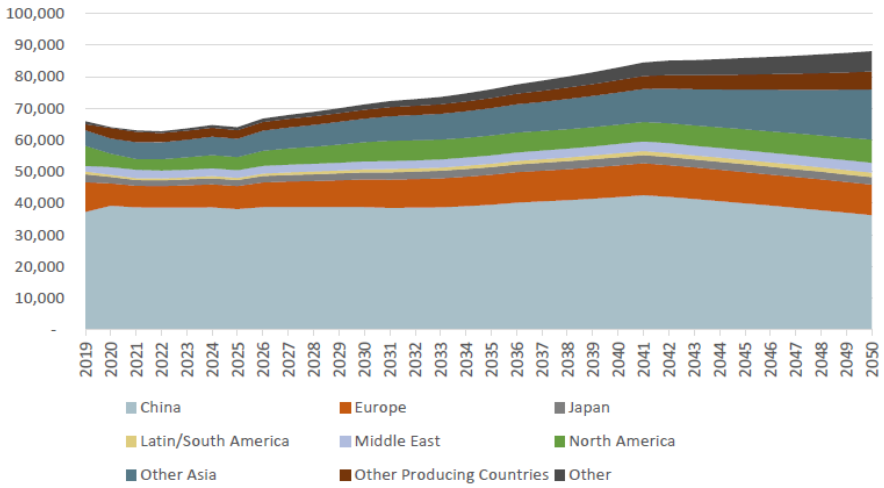

Figure 3.1. Consumption of primary aluminium and predicted demand up to 2050 [IAI, 2022, p. 10]

Another reason for the rise in aluminium demand is that it is one of the most important materials for green technologies. Aluminium is the primary material used in solar photovoltaic technology, according to a recent World Bank Group study, accounting for over 85% of most solar PV components. Aluminium is also required for concentrated solar power systems, as it is required to support mirror structures [The World Bank, 2020].

In addition, aluminium is employed in wind energy, primarily in the cabling of wind turbines. Aluminium is used as a cathode (e.g., nickel cobalt aluminium oxide) in batteries, especially next-generation solid-state batteries, for energy storage. Finally, aluminium is an important component of nuclear, coal, and gas technologies [The World Bank, 2020].

The report also includes six possible energy generation and battery storage scenarios developed by the International Renewable Energy Agency and the International Energy

Agency. The scenarios are being used to forecast mineral demand for green technology up to the year 2050. Iron and aluminium are anticipated to have the greatest rise in demand among 17 minerals and a variety of energy technologies. The demand for aluminium is mostly driven by solar PV components, and it is predicted to rise from 28 to 322% from the base scenario, depending on the scenario (approximately 40 to 160 million tonnes of aluminum). Regardless of the situation, absolute demand for primary aluminium might reach critical levels, putting pressure on the sector to meet these demands [The World Bank, 2020].

Another unique property of aluminium is an important one for the sustainability agenda - aluminium has a high potential when it comes to recycling and reuse, especially because it can be recycled many times without losing its quality [The World Bank, 2020]. As stated by the IAI [2020], aluminium is one of the most recycled materials in the world with around 30 million tonnes of aluminium scrap being recycled [IAI, 2020].

3.1.1 From bauxite to aluminum

Permits

Depending on the country of the mining location, there are different permits, approvals and licences necessary to open an operating bauxite mine. Most of the cases require to complete an environmental and social impact assessment. Frequently mining operators are asked to gather other documentation such as [IAI, 2022, p. 24]:

- Exploration permits;
- Feasibility study approval;
- Land use permits;
- Import / export permits;
- Port usage permits;
- Water allocation licences;
- Effluence discharge permit;
- Tailings dam approval;
- Sewerage treatment plant licences;
- Waste disposal licence;
- Transport of bauxite;
- Mine closure plan approval
- Environmental (and social) impact assessment.

Geology/Distribution

Around 90% of the bauxite resources are found in tropical and sub-tropical areas withe the most substantial concentrations in Central and South America, in West Africa, Southeast Asia and Australia (see 3.2) [Donoghue, Frisch, and Olney, 2014; IAI, 2022]. Bauxite is usually found in large, rather thin (average 4-6 m) blanket deposits that are close to surface and covers great areas up to hundreds of square kilometers.

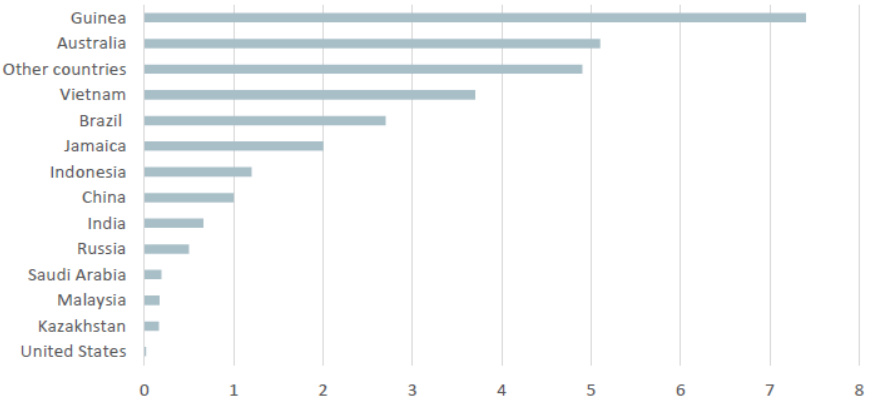

Figure 3.2. World's bauxite reserves in million metric tons [IAI, 2022, p. 13].

In Europe, bauxite resources are limited with increasing processing costs which has lead to the inclusion of bauxite in the European Commission's Critical Raw Materials [European Union, 2020; Bagani, Balomenos, and Panias, 2021].

Bauxite is often mined using open cast processes, which need a considerable amount of surface area. However, the lifespan of a typical bauxite mine is quite short, resulting in faster rehabilitation. As a result, it is critical to consider the efficacy of rehabilitation operations and ensure that they are incorporated in mining projects [Bagani, Balomenos, and Panias, 2021].

Nevertheless, bauxite mining is known to have large environmental and social impacts. First of all, due to bauxite's distribution in tropical areas, the deposits can overlap with areas with a high conservation value [IAI, 2022]. Secondly, as bauxite frequently occurs in thin layers near the surface, the deposits normally cover large areas of land which can have a significant effect on the local communities. Moreover, the lands used for mining or mining-related activities are often located near or on indigenous lands. Excavation process also requires a large amount of water that is shared with the surrounding communities [J. Knierzinger, Knierzinger, and Brian, 2018].

Mining processes, on the other hand, can have a positive impact on local communities by providing new business prospects and jobs. As a result, positive impacts should be handled with the same urgency as negative impacts in order to ensure long-term mining sustainability [J. Knierzinger, Knierzinger, and Brian, 2018].

Mining Technology [2020b] has published top 10 of largest bauxite mines in the world by 2020:

Mine	Location	Ownership	Production (mtpa, 2020)	Predicted closure
Weipa Mine	Australia	Rio Tinto	35.009	2058
Huntly Mine	Australia	Alcoa	25.133	2044
Boddington Mine	Australia	South32	18.325	2034
Sangaredi Mine	Guinea	Government of Guinea	16.506	2038
Gove Mine	Australia	Rio Tinto	12.299	2030
MRN Mine	Brazil	Vale	11.629	2026
Willowdale Mine	Australia	Alcoa	9.667	2044
GAC Mine	Guinea	Emirates Global Aluminium	8.4	2039
Boffa Mine	Guinea	Aluminum Corporation of China	8.062	2020
Paragominas Mine	Brazil	Norsk Hydro	6.998	2041

Table 3.1. 10 world's biggest bauxite mines [Mining Technology, 2020b]

Bauxite mining industry is growing and there are a noticeable amount of upcoming mines including Aurukun Project in Australia (annual production capacity of 8 Mtpa), Mbalam-Nabeba Iron Ore Project in Cameroon (7.68 Mtpa) and Bakhuis Bauxite Mine in Suriname (6.9 Mtpa) [Mining Technology, 2020a].

3.1.2 Production

There are different methods how to extract produce aluminium, however, the most commonly used one consists of three phases (see 3.3). The process begins with the the extraction of bauxite from the ground, following by phase two which includes alumina production from bauxite (Al_2O_3) by the *Bayer process* developed in late 19th century. Bayer's process is a four-stage operation, including a stage of heating alumina up to 1000°C which consequently generates a noticeable amount of emissions [Bagani, Balomenos, and Panias, 2021; The World Bank, 2020].

Phase three involves converting alumina to aluminium, also known as *Hall–Heroult process* [Bagani, Balomenos, and Panias, 2021]. This process involves substantial amounts of electricity which, together with electrolysis process, makes it the most carbon-intensive part of aluminium production. The amount of emissions therefore differ depending on the source of electricity that is used for the process [The World Bank, 2020].

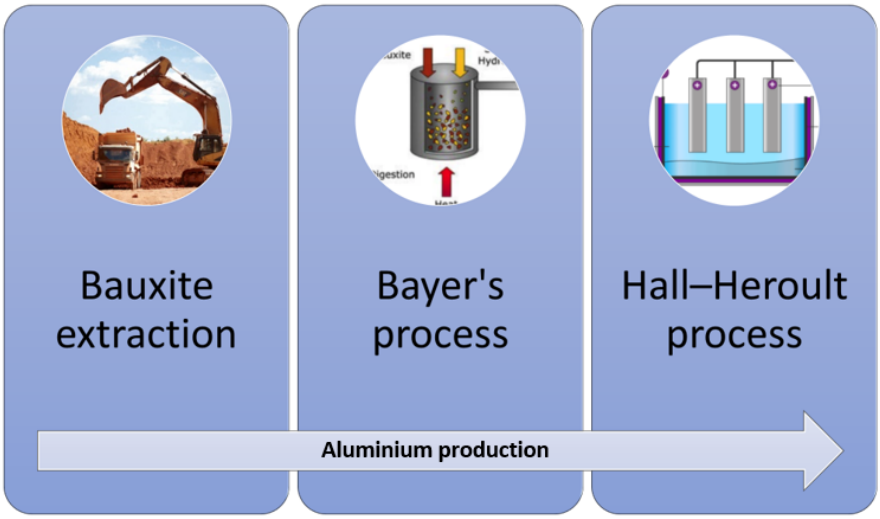

Figure 3.3. Stages of aluminium production.

Historically, bauxite has been mined by a rather small number of significant players, usually operating large scale mines and taking a part in processes from raw material extraction to manufacture of products. However, recently, mostly due to China's increasing demand, there has been a shift in the structure of the aluminium industry where bauxite mining has become separated from the other processes in the aluminium value chain. There has been a noticeable share of new aluminium producers and new countries in the bauxite market. More countries such as Guinea, Vietnam, Malaysia and Indonesia now export bauxite to China, which is, according to IAI [2022, p. 11],:*"leading to a diverse and dynamic industry"*. In some cases, the entrance of the new players has led to poor mining practices even resulting in stoppage of bauxite mining and shipping [IAI, 2022].

Even though Bayer's process is efficient, it also faces challenges with the ore quality and the bauxite residue generated during the production. The amount of bauxite residue, also known as "red mud" depends on the quality of the ore and can be as little as 0,3 up to 2,5 tons of residue per 1 ton of alumina [Kovacs et al., 2017; Angelatou et al., 2021]. Even though, some experts do not consider red mud as a waste, as it can be used as a raw mineral [UC RUSAL, n.d.], it is a significant environmental and resource waste issue [J. Knierzinger, Knierzinger, and Brian, 2018].

3.1.3 Alternative sources

With a high demand, limited bauxite deposits in Europe, and noticeable environmental and social impacts there is a high need for an alternative sustainable alumina source [Dissanayake et al., 2021; Bagani, Balomenos, and Panias, 2021].
One of the alternatives is the production of alumina and aluminium from anorthosite. Anorthosite is intrusive igneous rock composed predominantly of calcium-rich plagioclase feldspar [Britannica, 2017]. A new method, patented as Aranda-Mastin technology, has a potential to face environmental and sustainability issues/challenges within mineral and metal industry and mitigate environmental their environmental impact by a co-production

of three essential raw materials - alumina, silica and precipitated calcium carbonate. The technology has a zero-waste goal by minimising bauxite residue and carbon dioxide from production [Angelatou et al., 2021]. According to Angelatou et al. [2021], anorthosite is a noteworthy alternative for alumina production: *"Anorthosite is one of the best alternative source materials for alumina production because it is abundant, widely present in Europe (and worldwide) and has a unique chemical composition that allows the production of not only 1, but up to 3 high-demand raw materials from the same process, with no hazardous residue [Angelatou et al., 2021, p.6]"*.

Another material that can be used as an alternative alumina source is laterite which is a mixture of minerals, consisting mainly of aluminium and iron oxides and hydroxides formed by intense weathering of silicate rocks. These rocks are mainly found in tropical regions including India, Australia, Africa, Indonesia, and Sri Lanka. Dissanayake et al. [2021] describes an acid leaching extraction method that has a potential to utilize laterite as an alternative source.

Intensive research has also been carried out on the extraction of alumina from clay minerals from which kaolin is a promising option due to a relatively high aluminum content and worldwide occurrence. Up to the present time, different processes to extract alumina from clays have been investigated, mainly by an acid or an alkali process dissolving alumina [ElDeeb et al., 2019].

Another alternative rock for alumina production is nepheline syenite. It is a plutonic rock consisting mainly of nepheline, sodium, and potassium feldspars and can be found mainly in Russia, Norway, Canada, and Turkey. Even though it has a high aluminum content, the extraction yield for this source is low or medium mostly due to low dissolution rate of alkali feldspars. Moreover, aluminum extraction from nepheline syenite requires a high amount of energy and has a considerable CO2 footprint [AlSiCal, 2021; Bagani, Balomenos, and Panias, 2021].

3.1.4 Sustainable aluminium production

Regardless the method, mining alumina supplies the world with a highly demanded material that is important for other industrial sectors, also providing well-being for society and global economy. However, it can also be a cause of social (and environmental) impacts. As Mancini and Sala [2018] points out, due to this dual meaning of mining for society: *"(...) the improvement of the sustainability performance is a very important objective both for industry and for the European policy, willing to boost a sustainable supply of raw materials"* [Mancini and Sala, 2018, p. 98]. The need to improve partly comes from the fact that mining development has been associated with negligence for its social impacts and affected communities. There are known cases, especially in the developing part of the world, of large investments of capital in mining projects declaring the contribution to socioeconomic development, while actually bypassing the local communities and benefits left in a marginalised state [Kilian, 2008].

The importance of improving sustainability performance for the aluminium industry has also been mentioned in a report *"Sustainable Bauxite Mining Guidelines: Second edition*

2022" made by a collaboration of International Aluminium Institute (IAI), Australian Aluminium Council (AAC) and Brazilian Aluminium Association (ABAL). It states that the objective of the aluminum industry is: *"a long-term, sustainable bauxite mining industry with acceptably low social and environmental impacts during operation and post-closure"* [IAI, 2022, p. 4].

ICMM [n.d.] has listed ten principles of sustainable mining, written with the UN Sustainable Development Goals and the society's changing views of mining in mind. The principles include:

- Ethical business practices and sound governance;
- Sustainable development considerations in decision making;
- Respect for human rights;
- Effective risk management;
- Health and safety performance;
- Environmental performance;
- Conservation of biodiversity and land use planning;
- Responsible use and supply of materials;
- Social contribution;
- Engagement and transparent reporting.

The report from IAI [2022] also presents guidelines for sustainable bauxite mining, which includes instructions for governance, community assessment and contribution, health and safety, and environmental management and performance. According to IAI [2022, p. 6], bauxite mining operators should, between other points :

1. Document the values, policies, and procedures for their processes, including decision-making;
2. Comply with government regulations;
3. Publish their performance, including details of significant non-conformance or penalties
4. Undertake an SIA prior to mining and ensure any significant risks identified are appropriately mitigated;
5. (...).

Because mining companies' SIA procedures are frequently of poor quality, particularly in developing countries [Kilian, 2008], it is critical to understand the requirements of local populations and how the mining operations may provide benefits and prevent negative consequences. SIA is currently the most widely utilised tool for assessing these issues. It can also be used as a management tool to implement sustainable development policies or guidelines to help advance the agenda for sustainable bauxite mining and aluminium manufacturing [Joyce and MacFarlane, 2001; Vanclay et al., 2015]. Moreover, a well integrated SIA can enhance the social sustainability of the sector, especially by gaining trust and acceptability [Mancini and Sala, 2018].

3.2 Social Impact Assessment

With a raising awareness of social and environmental problems worldwide and an increase of discourses of social issues such as business and human rights discourse, particularly due to UN Guiding Principles on Business and Human Rights in 2011, social risk discourse, etc., social impact assessment has an increasingly important role for private and public projects [Vanclay, 2020].

However, a study commissioned by the European Commission 2010 has compared and analysed the different SIA practices within European Union and has concluded that the assessments are still immature in most member states. Compared to environmental or economic impacts, social impacts are quite often less developed. The Evaluation Partnership and Centre for European Policy Studies [2010, p. 1] report acknowledges key reasons to why social impacts can be mistreated:

1. IA (including social IA) is generally difficult to effectively reconcile and integrate with previously existing policy processes;
2. social impacts can be particularly difficult to assess;
3. some IA systems place the main emphasis on economic impacts (explicitly or implicitly).

3.2.1 What are social impacts?

The term "social impacts" has many different definitions, therefore it lacks a consistent understanding among practitioners. Moreover, the definitions has a potential to be so broad that it can have an insufficient meaning to non-practitioners [The Evaluation Partnership and Centre for European Policy Studies, 2010]. Social impact can be defined as: *"something that is experienced or felt, in a perceptual or corporeal sense at the level of an individual, social unit (family/household/collectivity) or community/society"* [Vanclay et al., 2015, p. 95].

While SIAs are often undertaken as one part of an integrated impact assessment, Vanclay [2003] points out that the social impacts that are considered in EIAs, e.g., demographic changes, job issues, financial security, and impacts on family life, are not broad enough and creates a demarcation problems of which social impacts need to be detected when performing SIAs. Vanclay [2003, p. 8] states that *"(...) all issues that a ect people, directly or indirectly, are pertinent to social impact assessment"*. To conceptualise social impact Vanclay recommends to see changes in one of more of following areas:

- people's way of life,
- their culture,
- their community,
- their political systems,
- their environment,
- their health and wellbeing,
- their personal and property rights,
- their fears and aspirations.

Different actors have developed lists of types of social impacts. Some of them can be criticised by being too long and complex, including gray areas and overlaps [The Evaluation Partnership and Centre for European Policy Studies, 2010]. With many publications providing a classification of social impacts, the nature of the social setting is complicated and many specialists identify the problem of detailing all dimensions of social impact [Van Schooten, Vanclay, and Slootweg, 2003]. Some authors state that a universal list of social impacts that would match every assessment is not possible [Van Schooten, Vanclay, and Slootweg, 2003]. Also [Vanclay et al., 2015] reminds that and SIA should not start with a checklist of potential impacts but with an evaluation of the specific case.

Moreover, in literature, there is a certain confusion between social change process and social impact. Some social impact variables used in SIAs do not necessary create an impact, as it depends on the specific history and characteristics of the community [Van Schooten, Vanclay, and Slootweg, 2003].

Furthermore, there is a lack of methods, data sources and tools of how to assess social impacts on quantitative level. In reality, a lot of SIAs are purely qualitative, in some cases even superficial. Nevertheless, it is essential to stay realistic to which social impacts can be quantified and which have to settle as qualitative [The Evaluation Partnership and Centre for European Policy Studies, 2010].

At the end, the definition and a choice of selected social impacts for an SIA is depending largley on the local impact assessment systems in place [The Evaluation Partnership and Centre for European Policy Studies, 2010], the objective of the SIA and the skill sets of the practitioners [IAIA, n.d.].

3.2.2 Definition and objectives

The International Principles for Social Impact Assessment defines SIA as a "processes of analysing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions" [Vanclay, 2003, p.6]. At the project level SIA mostly includes certain activities [Golder Associates, 2019, p. 3]:

- collection of baseline data
- identification and assessment of potential adverse impacts and benefits of a project
- identification of social management measures to help mitigation, avoid, management and/or compensate for adverse impacts
- identification of measures to support and enhance project benefits and benefit opportunities
- identification of monitoring mechanisms to understand effectiveness of proposed management measures and requirements for their adaptation.

The objective of an SIA can differ based on the situation. It can be undertaken as a part of a legal and regulatory obligation, for example, as a requirement under EIA or ESIA, as well as a voluntary process executed by companies that seek to obtain community social approval. By linking benefit enhancement and harm mitigation to community goals and

objectives, a well-integrated SIA has the ability to help people and communities achieve sustainable development results [Golder Associates, 2019].

3.2.3 Brief history of SIA

In the 1970s, SIA was formalised in the United States, coinciding with the start of EIA. SIAs were first used as a regulatory instrument, but they were only required in a few jurisdictions, which is why they were not as popular as EIAs at the time. SIA split from EIA due to disparities in biophysical environmental issues and social issues, and expanded to be *"a field of research and practice (discourse, paradigm) that focused on the management of social issues at all phases of the project"* [Vanclay, 2020, p.126]. Consequentially, SIA's primary task had improved from a tool that influences "go" or "no go" decisions to a tool that improves the management of social issues [Vanclay et al., 2015].

Vanclay [2020] writes that SIA is now a part of companies way to do business being a part of their environmental and social management systems. SIAs are also required by international financial and lending institutions, which has influenced the quality of SIA practices [Golder Associates, 2019]. Moreover, those institutions have their own procedures, standards or guidelines for SIAs, for example the Performance Standards of the International Finance Corporation [IFC, 2012].

3.3 Challenges

Even though the SIA practice has improved over time, some issues can be pointed out. One of the first issues is that there is no one way of conducting an SIA - there are different disciplines and theories used in various socio-cultural and geopolitical environments [Suopajärvi, 2013].

Moreover, SIA can be done for different proposes in different contexts which can create difficulties to evaluate it. As it has been pointed out by [IAIA, n.d.]: *"The nature of an SIA done on behalf of a multinational corporation as part of that company's internal procedures may be very di erent to an SIA undertaken by a consultant in compliance with regulatory or funding agency requirements, or an SIA undertaken by a development agency interested in ensuring best value for their country's development assistance. These, in turn, may be very di erent to an SIA undertaken by sta or students at a local university on behalf of the local community, or an SIA undertaken by the local community itself"*.

[Suopajärvi, 2013] states a similar idea saying that on the practical level SIA can differ due to the choices made by the SIA practitioner depending on what theoretical premises, research subject and methods that will be used in the assessment. Mancini and Sala [2018] adds that due to the variety of approaches, targets and indicators used when conducting an SIA, a harmonisation of indicators could benefit the communication between stakeholders.

Another challenge for SIAs is their worrying state of quality. Quality and effectiveness are the most discussed concepts regarding EAs, which underlines two problems: the overall concern about the quality of EA and the different perceptions of the precise meaning

of the concepts [Lyhne et al., 2016]. Indeed, during the years of SIA existence, it has received criticism regarding the quality and several recommendations for strengthening quality control [Martinez and Komendantova, 2020]. As [Esteves, Franks, and Vanclay, 2012] points out, due to the narrow capacity of regulators and the lack of resources that are dedicated to quality control, a common practice is to generate assessments that meet the minimum of the expectations of regulators.

Various studies have focused on different aspects of the quality. [Lyhne et al., 2016] recognises two dimensions of EA quality: the credibility of an EA and the appropriateness of its scope. Credibility, in this case, is related to validity of the EA study and therefore includes for example, validity of the methods, the ability to reproduce the study and accuracy of the data used. The scope of an EA, according to Lyhne et al. [2016, p. 124] should be: *"neither too narrow nor too broad, and establishing the scope is interpreted primarily to involve expert-led approaches to determining the importance of impacts and issues"*. Issues of scoping is one of the three key problematic areas in EA practice according to Ross et al. [2006].

Bond, Retief, et al. [2018, p. 53] however, acknowledges eight dimensions of quality:

- Efficiency: the extent to which the best outcomes possible are achieved through an IA process given existing constraints;
- Optimacy – the extent to which the process follows best practice (e.g. international standards) rather than the minimum requirements in any jurisdiction;
- Conformance – the extent to which an IA complies with set requirements;
- Legitimacy – the extent to which individuals and society regard the process and outcomes of an IA as being reliable and acceptable;
- Equity – the extent to which the impacts or benefits identified in an IA, and the steps taken to address the impacts or benefits, are evenly and fairly distributed across society;
- Capacity maintenance – the extent to which the practitioners of IA maintain the skills and knowledge to achieve the other aspects of quality;
- Transformative capacity – the extent to which the IA has empowered individuals or has changed values (institutional or individual) or increased knowledge and/or understanding;
- Quality management – the extent to which the quality is measured, monitored and managed by those conducting the IA.

Bond, Retief, et al. [2018] claims that while effectiveness may be considered one of the characteristics of quality, it is more practical to think of quality as an input to effectiveness.

In European Union, a report on the application and effectiveness of the EIA Directive, published by the European Commission reveled concerns regarding the quality of EIAs. The report underlines problems of quality in both the information used in the EIA documentation and the quality of EIA process and points out certain issues, including the lack of alternative assessment and monitoring. In 2014, EU adopted the EIA Directive 2014/52/EU amending the Directive 2011/92/EU, which pays a grater attention to challenges regarding EIA, including one of the key points in relation to the quality and the content of the reports [European Parliament and Council, 2014]. The amended

directive highlights the importance of improving the data and information quality that is included in the report, which should be *"complete and of su ciently high quality"* [European Parliament and Council, 2014, p. 5].

Furthermore, Article 5(3) lists actions necessary for ensuring the completeness and quality of an EIA report:

> "In order to ensure the completeness and quality of the environmental impact assessment report:
>
> (a) the developer shall ensure that the environmental impact assessment report is prepared by competent experts
>
> (b) the competent authority shall ensure that it has, or has access as necessary to, sufficient expertise to examine the environmental impact assessment report;
>
> (c) where necessary, the competent authority shall seek from the developer supplementary information, in accordance with Annex IV, which is directly relevant to reaching the reasoned conclusion on the significant effects of the project on the environment."

Figure 3.4. Article 5(3) of EIA Directive 2014/52/EU [European Parliament and Council, 2014, p. 10].

As it can be seen in Figure 3.4 there are certain requirements for the practitioner and competent authority to provide completeness and quality of an EIA. Nevertheless, it is not specified by the EIA Directive what "sufficiently high quality" intends.

In addition, Ross et al. [2006] points out that determining the significance and quality of EISs is another aspect of SIAs that is problematic. In the most recent, the authors identify ten types of problematic EISs and argue that improving the quality of EISs requires work from all parties, including government regulators and consultants.

4 Research Question

SIA is the most frequently used tool to assess and manage the social impact of mine related operations Joyce and MacFarlane [2001]. However, according to Vanclay et al. [2015] and Martinez and Komendantova [2020], the current practice of SIAs is often lacking quality, which can be worrying, as quality of the process and the report is a key elements to the effectiveness of the SIA [Jalava et al., 2010; Lyhne et al., 2016]. Furthermore, there are certain challenges in relation to quality. Firstly, the interpretation of the concept of quality differs from one person to another based on their personal experience and values Lyhne et al. [2016] and Jalava et al. [2010]. Secondly, there is a definite lack of literature regarding the quality of SIAs, moreover, regarding the mining industry. Due to historical reasons, most of the academic literature regarding quality is concentrated on EIAs.

Based on [The World Bank, 2020], the demand for primary aluminium is growing and expected to increase due to several reasons, including aluminium's physiochemical properties which makes it one of the key materials in the development of green technology. Therefore, bauxite mining, as the traditional method for extracting alumina, is also expected to increase [IAI, 2022]. However, bauxite mining is known to generate notable social impacts on the surrounding communities due to reasons such as its distribution, geological properties and mining operations.

The previously mentioned factors calls for an investigation of the quality in the bauxite mining sector, which leads to a following research question:

What is the state of quality of Social Impact Assessment in the field of bauxite mining and how to improve it?

To provide a structure for the research, following sub-questions have been defined:

1. What is the quality of SIAs in bauxite mining sector?
2. How to improve quality of SIA?

The following Chapter 5 of this study describes the conceptual framework that is used to understand and analyse quality of selected EA reports. Chapter 6 includes methodology and includes description of research design, analytical approach, case and document studies. Chapter 7 is devoted to analysis of the selected cases and indicators and Chapter 8 discusses ways to improve quality of SIAs. The project is finalised by the conclusion in Chapter 9.

5 Conceptual framework

Even though the practice of SIAs has improved since the beginning of the process [Vanclay, 2020], there is a noticeable lack of SIA's quality studies. Due to the lack of literature specifically on SIA and the fact that a large portion of SIAs are conducted as a part of an integrated environmental assessment such as EIA, ESIA or SEA, this section is largely inspired from the literature in relation to EAs.

It should also be pointed out that this study acknowledges the distinction between the quality of an impact assessment process and a quality of EIS (EISs[1]), however, the project will use one conceptual framework for assessing the quality.

Based on the literature, it is noticeable that there are various aspects of quality and numerous factors that influence it. As Martinez and Komendantova [2020] points out, the political and regulatory frameworks play a major role in the quality of the SIAs, as it sets the tone and the minimum requirements for the whole process. The effect of it can be seen by the attention to details of SIA in different countries, for instance in Canada where the regulations are demanding enhancement measures to maximise the positive impacts from projects [Golder Associates, 2019].

According to Martinez and Komendantova [2020] and Esteves, Franks, and Vanclay [2012], another aspect that has an impact on the quality of the EAs is the methodological approach, which can also be influenced based on the fact if the SIA is carried out as a component of an EIA, where the attention to social issues can possibly be reduced than when an SIA is done separately.

Furthermore, the skills of the EA practitioners play a critical role in the quality of SIAs [Esteves, Franks, and Vanclay, 2012; IAIA, n.d.]. With SIA being a transdisciplinary social study, which includes aspects from various fields of studies, it is essential that the persons performing the assessment are qualified and has knowledge in social sciences [Esteves, Franks, and Vanclay, 2012].

5.1 Quality indicators

Quality evaluation is important due to several reasons. First, it is considered as one of the main factors affecting the possible effectiveness of an impact assessment [Jalava et al., 2010]. Second, a qualitative SIA also uncomplicates the process of reviewing for governments and involved communities. In addition with that, quality influences decision-making processes and the time that is spent to evaluate the situation [Ross et al., 2006].

[1]EIS can be described differently in different jurisdictions, for example sometimes they are called an EIA Report [Jalava et al., 2010, p. 26]

The evaluation of evaluation is on a large scale dependent on the criteria it is measured against. As it is mentioned before, the understanding of the quality differs, depending on the person, which can complicate the evaluation process. Different authors have focused on different quality indicators, e.g., the credibility of the EA report [Lyhne et al., 2016], efficient scoping process [Ross et al., 2006; Lyhne et al., 2016], correct significance determination [Ross et al., 2006; Lawrence, 2007], complete and thorough stakeholder mapping [Bice, 2019; Vanclay et al., 2015; Ross et al., 2006; Kilian, 2008], etc.

With quality being a holistic concept, consisting of various factors that influences it, this study is focusing on two of these aspects - mitigation measures and public participation. The current selection is based on the results of the initial screening of EA reports (see chapters 6 and 7), combined with the statements from the literature.

5.1.1 Mitigation

According to Vanclay [2003], the general idea of an SIA is to analyse, monitor and manage social impacts. Likewise, Tinker et al. [2005] implies that mitigation is a key aspect of an EA by stating:

"Mitigation could be considered as the foundation of the whole EIA process, in that it is the requirement to identify mitigation measures that translates the findings from the EA into recommendations to reduce the environmental impacts" [Tinker et al., 2005, p. 265].

Despite of that, it can be seen in the EA practice, that there are challenges regarding the proper mitigation measures [Larsen, Hansen, et al., 2015; Tinker et al., 2005; Jalava et al., 2010; Larsen, Hansen, et al., 2015]. The results of a study by Larsen, Hansen, et al. [2015] show that there are cases where the mitigation measures are not even addressed in the documentation or, in some cases, postponed.

In the EA practice, there is a noticeable share of cases where measures to mitigate impacts are understood as a list of non-binding proposals without a follow-up, which directly affects the quality and effectiveness of an EA [Tinker et al., 2005].

Furthermore, according to Larsen, Kørnøv, and Christensen [2018], there is an inconsistency between fundamentals of the mitigation hierarchy (see Figure 5.1) and the practice. The authors conclude that even though the desired measure is to avoid the negative impact, most of the analysed cases focused on minimising and compensation measures. In addition, there is an absence of enhancement measures. Measures to mitigate social impacts can be of various nature, however there are instances when the mitigation measure is given but the technical solution is not [Jalava et al., 2010].

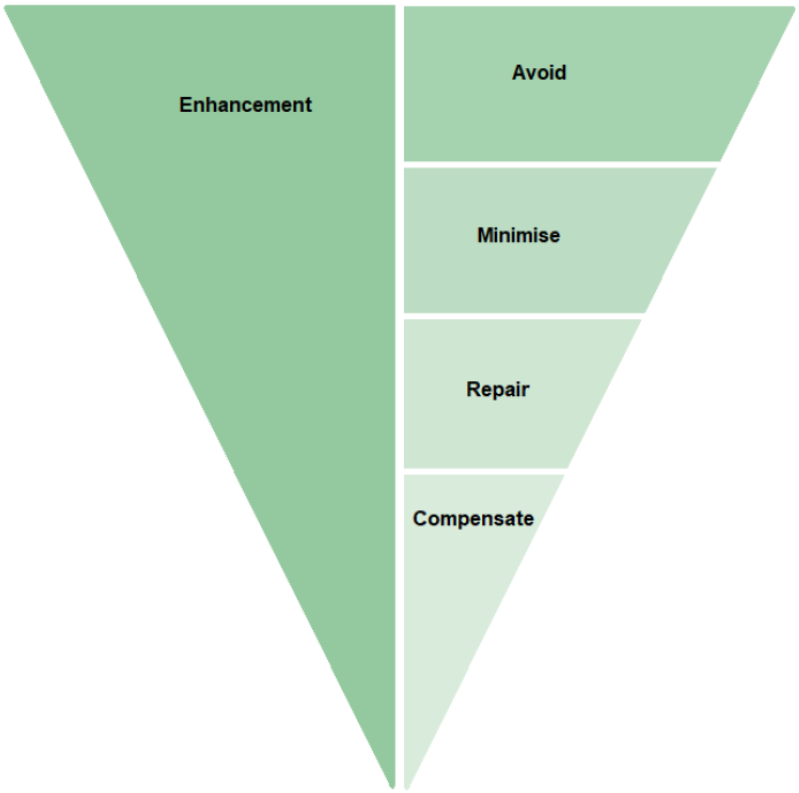

Figure 5.1. Illustration of mitigation hierarchy [Kørnøv, 2021].

5.1.2 Public participation

Numerous authors (Martinez and Komendantova [2020], Esteves, Franks, and Vanclay [2012], and Vanclay et al. [2015]) indicate the importance of public participation for a high quality SIA. Indeed, SIA has the potential to both embrace and restrict the involvement of the local actors. A well executed process can be beneficial for, among other reasons, a better understanding of the local communities, assisting them with understanding the upcoming changes and increasing their opportunities to respond to that change [Vanclay et al., 2015]. However, based on Bond and Pope [2012], public participation remains as a difficult issue in EAs:

"Inadequacies of public participation are frequently raised, with the SIA paper suggesting the process is failing to meet expectations for deliberation." [Bond and Pope, 2012, p. 3].

Moreover, the right to participate is determined by various international agreements. Besides that, the right to be involved in the process is also one of the core values of SIA, according to the *International Principles for Social Impact Assessment*:

"People have a right to be involved in the decision making about the planned interventions that will a ect their lives [Vanclay, 2003, p. 9]".

However, as Vanclay et al. [2015] points out, public participation is not a synonym to SIA. In fact, public involvement can be carried out as a regulatory requirement without any effect on decision-making.

For an effective public participation it is also important to engage with a wide range of stakeholders to both inform and invite for their input because *"local knowledge and experience are valuable and can be used to enhance planned interventions"* [Vanclay, 2003, p. 9], as it is stated in *International Principles for Social Impact Assessment* as one of the core values of the SIA.

Furthermore, the timing of the participatory events is also important, considering that an early executed community involvement in the project has a potential to influence the SIA and the project design. Efficient timing on public participation is also a part of the amendments to the EIA Directive (Article 6(2)):

"In order to ensure the effective participation of the public concerned in the decision-making procedures, the public shall be informed electronically and by public notices or by other appropriate means, of the following matters *early in the environmental decision-making procedures* referred to in Article 2(2) and, at the latest, as soon as information can reasonably be provided [European Parliament and Council, 2014, p. 10]".

6 Methodology

6.1 Research Design

The following figure (6.1) illustrates the structure of this report and the framework of the research methods used for it. The analytical approach is described in the next section.

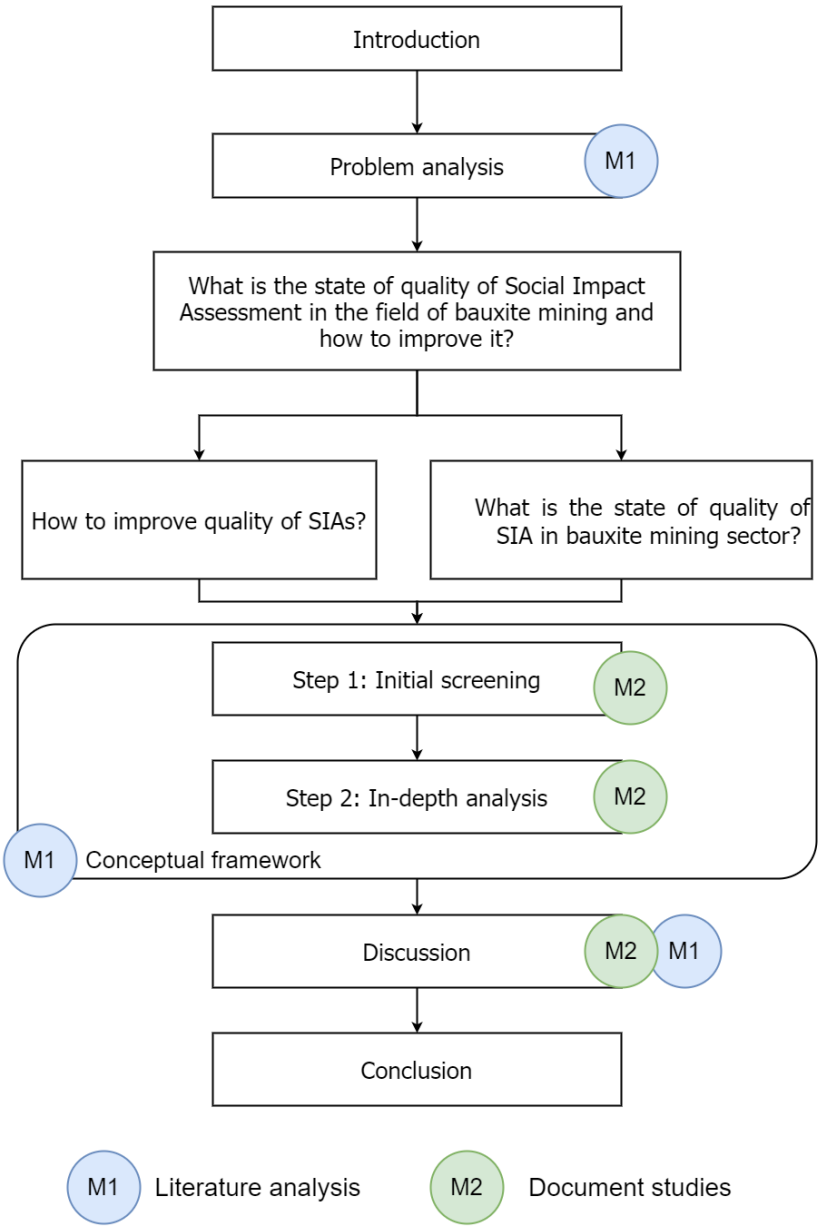

Figure 6.1. A visualisation of the report structure with the corresponding methods.

6.2 Analytical approach

To answer the first sub-question regarding the quality of SIAs in the bauxite mining sector, an analysis of EA reports has been carried out in two steps:

Step 1: Initial screening of the EA statements by selected criteria inspired by Vanclay et al. [2015] report "Social Impact Assessment: Guidance for assessing and managing the social impacts of projects", which provides a review criteria in a form of questions that are sufficiently dominant for a good SIA practice. The report presents over 80 points, however, for this project, the list of criteria was revised and shortened based on the knowledge of the subject gathered during research of the subject to covering all phases of an SIA that can be carried out without an extensive analysis of the reports. The list of criteria and results can be seen in Table 7.1. The combination of the results and the knowledge from the literature was used to select specific indicators to focus on in the in-depth analysis.

Step 2: Detailed analysis of the selected cases. The themes of the analysis are described in the section below.

As a result of the initial screening of the EA statements, various issues in relation to quality of the EAs had surfaced. Supported by the knowledge from the literature, following themes were selected for the analysis: mitigation measures and public participation.

Mitigation measures

First, due to the fact that effective mitigation measures are often lacking within the EA practice and the fact that mitigation of impacts is the key element of an EA [Tinker et al., 2005; Vanclay, 2003], this project analyses the mitigation of social impacts.

On account of previous statement that there are cases where mitigation measures are absent from the EA reports, this study is analysing if mitigation measures are included, which directly impacts the quality, as well as effectiveness of an EA. With a concern if the mitigation measures are specified and to evaluate their feasibility, the type of measures are assessed. Furthermore, as mitigation measures are often not followed up, which has an effect on the quality and effectiveness of an IA, the determination of the measures is assessed by analysing the following wording that is used to phrase the measures:

- *Could*: considered to be the weakest commitment to follow through with the mitigation;
- *Should*: considered to show a small level of determination, closer to a recommendation;
- *Must*: considered to be the the strongest commitment, indicating that the measures will be applied;

It should be noted that it is not always the exact word that is used but the context.

To increase the detail of the analysis regarding mitigation of impacts, they are measured against the mitigation hierarchy (see Table 6.1). As SIA is a tool that is used to mitigate the social issues [Joyce and MacFarlane, 2001], the level of mitigation measures reflect the quality of the EA.

Categories	Explanation
Avoid	Avoiding that a negative impact on nature arises
Minimise	Minimising a negative impact on nature
Repair	Repairing a negative impact on nature after it has occurred
Compensate	Compensating for an unavoidable negative impact on nature
Enhance	Enhancing a positive impact on nature

Table 6.1. Categories of mitigation measures applied in this project and their explanations. Content based on Larsen, Kørnøv, and Christensen [2018, p. 288]

As the Figure 7.1 shows, avoid is the most desired level of mitigation measures, followed by minimising of the impact when it is not avoidable. Repairing measures advocate to restore after the impact has occurred. Compensation is the lowest level of mitigation measures and it seeks to compensate for adverse impacts. Enhancement measures are meant to benefit the environment by enhancing the positive impacts [Larsen, Kørnøv, and Christensen, 2018; Tinker et al., 2005].

In cases, where the mitigation measure in the EA report is not using the direct wording of the mitigation hierarchy, they are interpreted based on the context and supposed meaning.

Public participation

As an adequate public participation continues to be an worrying issue [Esteves, Franks, and Vanclay, 2012] in SIA studies, this project analyses public participation. First, the timing of community involvement is investigated, as an early public involvement increases the chances to gather the accurate information about the social issues, identify the correct mitigation measures [Kanu, Tyonum, and Uchegbu, 2018], as well as the increases the quality of an SIA.

In order to have a deeper understanding the level of community engagement was assessed by the used and planned actions, which is based on the / Public Participation Spectrum (see Figure 6.2).

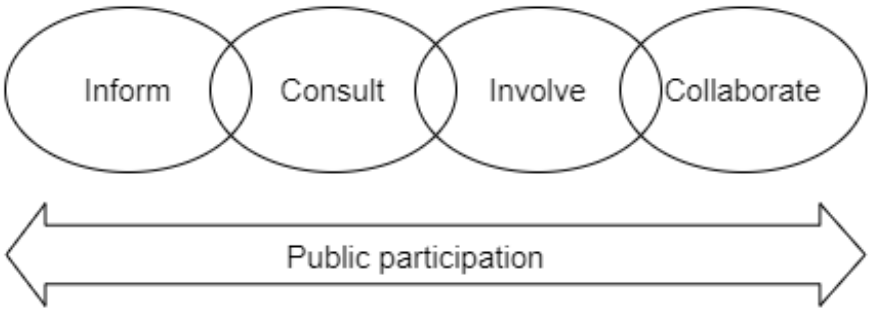

Figure 6.2. Levels of public participation. Inspired by Vanclay et al. [2015] and Kørnøv [2005]

As illustrated in Figure 6.2, public participation has different levels. *Informing* is considered to be the first level or precondition of participation and includes controlled informing the public without a feedback, which consequently does not have an impact on the quality of SIA. Next, *consultation* implies that there is a feedback and inputs

from stakeholders, therefore it has a potential to improve the quality of SIA. *Involvement* implies that the feedback from involved actors is affecting SIA, which also has a potential to heightens the quality of SIA. Lastly, *collaboration* implies that there is a partnership that provides a joint process of control and builds trust with the stakeholders, which indirectly can improve the quality of SIA by gaining data with higher accuracy [Vanclay et al., 2015; Kørnøv, 2005].

6.3 Case studies

Based on the results of the the initial screening, three reports were selected for a deeper analysis - one for each of poor, middle and high quality.

From three cases with high quality evaluation, *CBG Mine Extension in Guinea* ESIA report was selected due to its geographical location. From two cases with middle quality, *Special Mining Lease 173 in Jamaica* EIA statement was chosen considering the level of public involvement and sensitive location bordering with a protected area. Lastly, *Outer Valley in Jamaica* EIA report was selected to represent the poor quality assessment.

The continuing chapters are describing the three cases that are selected for an in-depth analysis.

6.3.1 Case 1: CBG Extension Project, Guinea (2016)

The Compagnie des Bauxites de Guinée (CBG) is a mining company owned partly by the Government of Guinea and Halco Mining. An ESIA assessing the proposed Sangarédi bauxite mines extension initiated in 2013 and was planned to increase bauxite production by 9 million tonnes per year. The increased extraction is connected to transport, processing and infrastructure development. Therefore, the purpose of the ESIA is to evaluate the potential environmental and social impacts in the planned area [ÉEM, 2016].

The ESIA is carried out for three seperate zones, all located in Boké prefecture ([ÉEM, 2016, p. 45]:

1. the bauxite mining area around Sangarédi;
2. the mouth of Rio Nuñez, an area that encompasses the CBG plant, the mineral loading port and the area used by the ships carrying the ore out to the estuary limit;
3. a corridor along the railroad between Sangarédi and Kamsar, with particular emphasis on two sections where rail sidings are to be built.

The proposed bauxite mining area includes towns of Sangarédi and Daramagnaki, as well as 100 villages and hamlets in 10 districts. The area is closely located to already existing mining plateaus, therefore a paved road system is connecting the biggest towns and villages.

The IA is mainly carried out by ÉEM in a collaboration with other companies, including Insuco - for the SIA. ÉEM is an environmental and sustainable development consulting company with a substantial experience in handling impact assessments. Insuco is a

consulting firm that specialises in the social sciences and engineering. The company has previous experience with the extractive industry and has an office in Guinea.

According to the US International Development Finance Corporation (DFC), which is financing the project, expects that it would increase the employment by *"additional 1,300 employees during construction and over 230 permanent employees during operations"* and *"bring significant additional revenue to the Government of Guinea"* [Early Warning System, 2020]. However, it is not clear if they plan to hire locally.

The central social issues related to this case relates to: "the involuntary physical and economic displacement required to restore the means of subsistence and living conditions for affected communities" [ÉEM, 2015, p. 2].

6.3.2 Case 2: Special mining lease 173, Jamaica (2021)

The EIA report has been prepared for Noranda Jamaica Bauxite Partners II (NJBP II) - a company that performs mining operations for New Day Aluminum (Jamaica) Limited (holds 49%) in a partnership with Jamaica Bauxite Mining Limited (holds 51%).

The project proposes to use bauxite reserves in Special mining lease 173 (SML 173), located in St. Ann and Trelawny. As the mining operations would introduce changes for the local water resources, biodiversity, land use, human settlements and cultural heritage, an EIA has been performed by *Conrad Douglas & Associates Limited*, which is an environmental management consultancy, established in 1985 and located in Jamaica. The proposed area is sparsely populated, with a rather poor road network, and with farming as the main economic activity [Conrad Douglas & Associates Limited, 2021].

It should also be mentioned, that this project has received a noticeable share of public reaction, calling the case "highly controversial", mostly due to it's sensitive location. SML 173 borders with an area which is proposed as Cockpit Country Protected Area (CCPA) by Prime Minister in 2017 where any kind of mining is prohibited. As stated in the report: *" (...) the government has given up valuable bauxite resources located within the proposed CCPA in order to protect valuable renewable resources, such as biodiversity and water resources. The value of the bauxite that has been given up (sequestered) by the government of Jamaica has been estimated to range from approximately US$1.44 billion to US$1.85 billion [Conrad Douglas & Associates Limited, 2021, p. 3]*".

The proposed rate of bauxite production, in this case, is 6 million tonnes per year in a mining area of 8,335 hectares, which can potentially bring US$ 150 000 000 yearly, which would be a significant contribution to Jamaica's economy.

The proposed project plans to provide 400 job positions, from which 20 are planned to be permanent during operations phase.

6.3.3 Case 3: Outer Valley, Jamaica (2022)

This project proposes mining and quarrying at "Outer Valley" Section of Special Exclusive Prospecting Licence (SEPL) 541 which is located in the parish of St. Elizabeth. The application to the authorities for the mining operations was submitted in May, 2020 by a Chinese-owned company JISCO Alpart Jamaica Limited. Consequently, the National Environment & Planning Agency requested an EIA study, which as carried out by a consultancy firm *EnviroPlanners Ltd*.

The proposed bauxite mining is planned for ten years and is prepared to extract 17 million tonnes of bauxite within 689.86 hectares. The area of SEPL 541 borders with another mining lease (Special Mining Lease 167), where bauxite is currently being extracted by JISCO Alpart Jamaica Limited, therefore, some parts of the project will be joined with the existing mining operations. Similarly as Case 2, the area also borders with the Cockpit Country Protected Area, however, does not mention it [EnviroPlanners Ltd, 2022].

The majority of the road network in the area is not paved with asphalt but limestone or soil, which makes the navigation and maintenance complicated. Most of the area is covered with fields (herbaceous crops, fallow, cultivated vegetables) [EnviroPlanners Ltd, 2022].

According to the local newspaper Early Warning System [2022], this project is one of the biggest investments made in Jamaica and is expected to provide 1000 jobs over the mining period. From those half is planned for direct job opportunities and half - for indirect jobs within the local communities [EnviroPlanners Ltd, 2022].

6.4 Document study

The empirical data for this project has been gathered through a document study. In this case, it consists of six EIA and ESIA reports for bauxite mining projects. Around 2500 pages were analysed for this project, that includes EIA reports and supplementary documents, e.g., public meeting, monitoring documentation. The EA reports were found through an internet search. Firstly, it was executed for the largest bauxite mines in the world. However, after the realisation that most of the impact assessment statements were not accessible to the public, a search was done by keywords, e.g. environmental impact, bauxite mine, social impact, impact assessment, impact statement etc.. In some cases, websites of the responsible authorities, mining companies homepages, financing institution web pages were also inspected. As a result from a time-consuming search of numerous web pages, following six impact assessment reports were found:

- Bauxite Hills Project (Australia): EIA
- CBG Mine Extension Project (Guinea): ESIA
- Outer Valley (Jamaica): EIA
- Special Mining Lease 173 Area (Jamaica): EIA
- Sierra Minerals Holdings limited bauxite mining project (Sierra Leone): ESIA
- Expansion of the middle Timan bauxite mine: ESIA (Russia).

7 Analysis

This section represents the outcome of the analysis. First part of it describes the results of the initial screening and the second one the results of the in-depth analysis that is focusing on mitigation measures and public participation in the selected cases as indicators for quality of IAs.

7.1 Results of initial screening

As it is described in Chapter 6, an initial screening of EA reports has been done with the selected content of good quality (see Table 7.1). The screening process results in an overall quality assessment of each EA report that seeks to evaluate the whole EA that consists of various criteria. The assessment, therefore, is done based on the amount of fulfilled criteria. However, there can be several reasons of why half of the cases are evaluated as good quality EAs. It can be related to both the amount and content of the selected criteria or related to accessibility of EA reports, as the search for EA reports has proven that in many cases, they are not published online.

Based on the results of the initial screening indicate a couple of points. First of all, the results indicate that the overall condition of EA statements is not "as black as they paint it", as three out of six cases are of good quality. Even though, it could be of various reasons, there appears to be a pattern, as all three of those are complying to IFC environmental and social standards.

Second, as it can be seen in the Table 7.1, it is possible to see, which areas are on some level covered in all six cases:

- Description of the objectives;
- Alternatives;
- Methodology for the EA;
- Establishment the significance of the impacts;
- Identification of social indicators;
- Mentioning of mitigation measures.

It should be pointed out that, the fact that a category is mentioned does not necessary mean that is it done properly.

Table 7.1. Initial screening of EA reports to review their quality. "X" represents that the specific criteria has been found in the report, "-" represents absence of the criteria and "+/-" is used in cases where it is somewhat mentioned but not fulfilling the criteria, for example, when report mentions impact enhancement measures in methodology but the actual measures are not described.

	Bauxite Hills Project (Australia)	CBG Mine Extension Project (Guinea)	Outer Valley (Jamaica)	Special Mining Lease 173 (Jamaica)	Sierra Minerals Holdings limited bauxite mining project (Sierra Leone)	Expansion of the middle Timan bauxite mine (Russia)
Document	EIA	ESIA	EIA	EIA	ESIA	ESIA
Author	Metro Mining	ÉEM	Enviroplanners LTD	CD&A	TEDA: Environmental Consultants	CSIR Environmentek
Year	2016	2015	2022	2021	2012	2004
Description of the project and alternatives						
Description of the project	X	X	X	X	X	X
Objectives and purpouse	X	X	X	X	X	X
Alternatives to the project	X	X	X	X	X	X
Description of methodology for the SIA						
Overarching methodology for the SIA	X	X	X	X	X	X
Process to establish significance of the impacts described	X	X	X	X	X	X

Table 7.1. Initial screening of EA reports to review their quality. "X" represents that the specific criteria has been found in the report, "-" represents absence of the criteria and "+/-" is used in cases where it is somewhat mentioned but not fulfilling the criteria, for example, when report mentions impact enhancement measures in methodology but the actual measures are not described.

	Bauxite Hills Project (Australia)	CBG Mine Extension Project (Guinea)	Outer Valley (Jamaica)	Special Mining Lease 173 (Jamaica)	Sierra Minerals Holdings limited bauxite mining project (Sierra Leone)	Expansion of the middle Timan bauxite mine (Russia)
Community profile and baseline data						
Stakeholder analysis	+/-	X	+/-	X	X	X
Different social groups within the region	X	X	+/-	X	X	X
Identification of social indicators to be used for baseline data collection	X	X	X	X	X	X
Described data collection	-	X	X	X	X	X
Community participation and engagement						
Evidence of engaging stakeholders	X	X	+/-	X	X	X
Evidence of how stakeholder input was actually utilised	-	X	-	-	X	+/-
Participatory processes	X	X	+/-	X	X	X

Table 7.1. Initial screening of EA reports to review their quality. "X" represents that the specific criteria has been found in the report, "-" represents absence of the criteria and "+/-" is used in cases where it is somewhat mentioned but not fulfilling the criteria, for example, when report mentions impact enhancement measures in methodology but the actual measures are not described.

	Bauxite Hills Project (Australia)	CBG Mine Extension Project (Guinea)	Outer Valley (Jamaica)	Special Mining Lease 173 (Jamaica)	Sierra Minerals Holdings limited bauxite mining project (Sierra Leone)	Expansion of the middle Timan bauxite mine (Russia)
Participatory processes established early in the project	-	X	-	X	X	X
Scoping, assessment of impacts and significance determination						
Scoping mentioned	-	X	-	-	X	X
Indicate how scoping was done	-	X	-	-	X	+/-
Mitigation and enhancement strategies						
Description of the mitigation measures	X	X	X	X	X	X
Consideration of enhancement measures	+/-	X	-	+/-	+/-	X
Grievance mechanisms and monitoring procedures						
Grievance mechanism	-	X	-	X	X	X

Table 7.1. Initial screening of EA reports to review their quality. "X" represents that the specific criteria has been found in the report, "-" represents absence of the criteria and "+/-" is used in cases where it is somewhat mentioned but not fulfilling the criteria, for example, when report mentions impact enhancement measures in methodology but the actual measures are not described.

	Bauxite Hills Project (Australia)	CBG Mine Extension Project (Guinea)	Outer Valley (Jamaica)	Special Mining Lease 173 (Jamaica)	Sierra Minerals Holdings limited bauxite mining project (Sierra Leone)	Expansion of the middle Timan bauxite mine (Russia)
Monitoring process established	-	X	X	X	X	X
Reporting and overarching issues						
Connection to SIA literature	Queensland Government General SIA Guideline 2013	IFC Performance Standards (2012)	-	-	IFC/World Bank Operational Policies	IFC's policy on EA
Clear roles and responsibilities	-	X	-	X	-	X
Notes	Very long	Very long		Focus on public participation, public perception		
Level of quality	Middle	High	Poor	Middle	High	High

In a similar manner, the screening allows to pinpointed the most problematic categories of quality, that are not fulfilled by all EAs.

- Identification of stakeholders;
- Identification of different social groups;
- Data collection;
- Public involvement early in process;
- Providing evidence of actually involving the public;
- Scoping process;
- Enhancement measures;
- Establishment of grievance mechanisms;
- Clear roles and responsibilities.

As the list illustrates, there are certain issues when it comes to quality indicators. This study, however, selects a couple of categories to analyse deeper based on the results of the screening and the knowledge from the literature. First, due to the visible lack of community participation and engagement, joined with the importance of it based on the literature (Chapter 5), the timing and level of public participation is analysed. Second, even though, mitigation measures are mentioned in all reports, the enhancement measures seem to be neglected. In addition, mitigation of social impacts is a key element of an SIA, therefore, this study analyses the mitigation measures in the selected cases.

There are other criteria that affect the quality but are not included in the initial screening, for example, the experience if EA practitioners, methods that are used to assess the potential impacts [Lyhne et al., 2016], communication of results (the layout and structure of the report), cumulative impacts and description of the affected environment [Bonde and Cherp, 2000].

Next section of the study represents the results of the in-depth analysis of three selected cases of various quality from the initial screening.

7.2 Mitigation measures of social impacts

The results of the document document study show that all reports have at some level included mitigation measures for social impacts. It is noticeable that the amount of different mitigation measures varies gradually from the "high" quality report with almost 300 measures, whilst the "middle one" has 74 and the "poor" quality report includes 52 measures.

As it can be seen in the reports, there is a wide range of categories of various mitigation measures. The top eight of the most common ones between all three cases are combined in Figure 6.1.

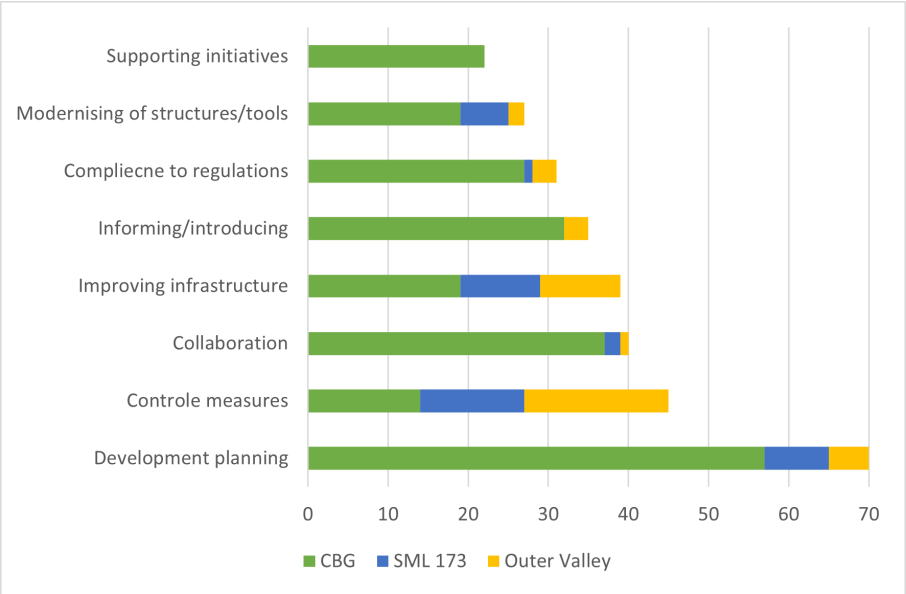

Figure 7.1. Various types of mitigation measures in the EA reports.

There are certain patterns that can be seen in Figure 6.1. Case 1 (CBG mine) demonstrates a focus on developing strategies, plans and mechanisms, including communication plan, resettlement and compensation action plan, community development plan and complaint-handling mechanism. A large share of Case 1 measures are aimed at communication with the local communities - informing and introducing the local communities, as well as building partnerships with various actors such as the authorities, concerned communities, businesses and NGOs. Furthermore, for a noticeable share of mitigation measures, compliance to a specific legislation, standard or guidelines (e.g., Guinea's 2011 Mining Code, IFC Performance Standard).

Case 2 (SML 173) and Case 3 (Outer Valley), however, concentrates on more pragmatic measures. The most common measure between those are numerous control measures, for example: *" (...) the control of runo will be exercised where orebodies are located close to private lands or public roads (...)"* [Conrad Douglas & Associates Limited, 2021, pp. 8–3]. Along with that, improvements for the infrastructure is another important category that is directed to e.g., paving roads, securing mining zones, erecting warning signs, etc.

According to the mitigation hierarchy, Figure 7.2 shows that most of the measures aim to minimise and compensate. This finding correlates with the findings of Larsen, Kørnøv, and Christensen [2018], which states: "(...) it is interesting that there are relatively few mitigation measures concerned with avoiding impacts, and rather many on minimisation" [Larsen, Kørnøv, and Christensen, 2018, p. 290]. Compensation seems to be the second most common measure. It is, however, not always specified what kind of compensation is planned. As stated in the Case 2 report, compensation was one of the four main issues discussed in the public meetings [Conrad Douglas & Associates Limited, 2021], which could indicate that compensation is the preferable mitigation measure by a share of involved stakeholders.

Measures to avoid and repair are less common compared to previous ones, even though

avoidance is the highest level of the hierarchy. The choice of mitigation measures that are used, could be connected to the fact that in the mining industry some impacts are unavoidable [Joyce and MacFarlane, 2001] or the possibility that some of the measures have been taken care of before the final EA statement, a process that is known as the "grey IA". Bidstrup [2017] has analysed 98 practices in Denmark and concludes that in *"45% had been adjusted either prior to or during the screening procedure (...)"* [Bidstrup, 2017, p. 233].

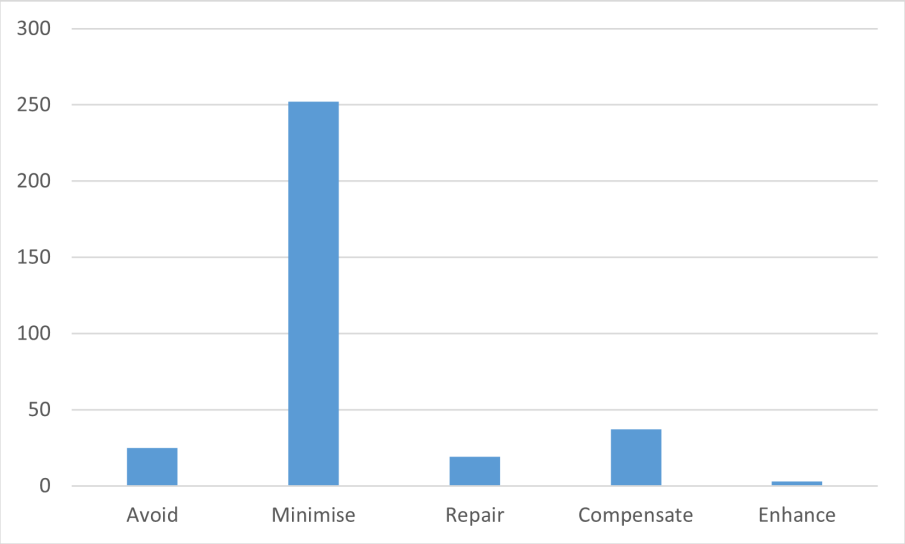

Figure 7.2. Mitigation measures against the mitigation hierarchy found in the EA reports.

As 7.2 illustrates, enhancement measures are the least used. It might be linked to the fact that the impact assessments are often conducted as a requirement to operate, therefore, focusing on the bare minimum of the demands [Joyce and MacFarlane, 2001], as well as the lack of a regulatory push to increase the level of mitigation measures and include enhancement of positive impacts as a requirement [Martinez and Komendantova, 2020; Golder Associates, 2019].

Figure 7.3 shows the words used to describe the level of commitment for the mitigation measures.

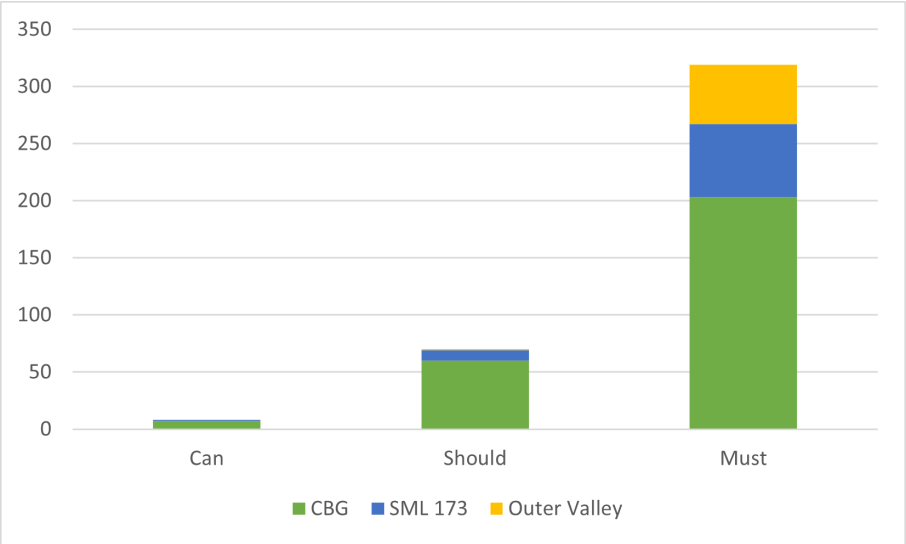

Figure 7.3. Phrases used to describe mitigation measures.

The figure illustrates that most of the actions are written as something that "must" be carried out, a way smaller number uses the word "should", which can be understood as a recommendation. The least amount of measures uses the word "can" or "could", which is perhaps the softest for of commitment and can be understood as a vague possibility. The result of this indicates that there is a strong pledge to the mitigation measures in all three reports. It speaks well for the quality of EA practices, as the follow-up of the mitigation measures tend to be disregarded and weak, affecting both the quality and effectiveness of an EA [Larsen, Kørnøv, and Christensen, 2018; Jalava et al., 2010].

The first part of in-depth analysis indicates several issues that affect the quality and, in many cases, also effectiveness of an EA. First, there are different amount of measures mentioned in the reports, as well as various types of measures to mitigate social impacts related to bauxite mining, which has a possibility to affect the follow-up. Second, in a disagreement with the mitigation hierarchy, most mitigation measures seek to minimise impacts in stead of avoiding them. It also shows that there is a definite lack of enhancement measures, despite the fact that they are "promised" when describing the methodology. However, from the positive side, the phrasing of the measures to mitigate social impacts distinctly shows commitment to follow through them.

7.3 Public participation

The document study reveals that there are different levels of public involvement in each of the cases. Before exploring that, it is interesting to mention that each of the cases has defined the involvement differently. Case 1 (CBG) has used the therm *public consultations*, while Case 2 (SML 173) has put an emphasis that the public participation process is voluntary and defined it as *voluntary public (stakeholder) consultations* and Case 3 (Outer Valley) has characterised it as *public consultation meeting*. As participation in the meetings or consultations should be voluntary to be able to gather high quality data, it can be considered as a positive thing. Nevertheless, all cases has the part of *consultation*, which

can lead to an understanding that in all cases public has been consulted, therefore there is a possibility to gather valuable local knowledge and data which increases the quality of an EA.

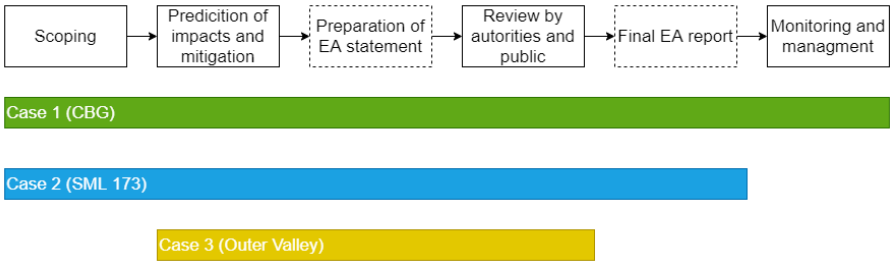

Figure 7.4. Timing of stakeholder engagement based on the EA reports.

As Figure 7.4 illustrates, stakeholder involvement is done in different phases of the EA assessment.

In case of the CBG bauxite mine (Case 1), it can be seen that diverse stakeholders have been involved in throughout the whole process of ESIA. With the project beginning in 2013, more than 500 locals (local authorities, sector representatives, elders, farm groups, NGOs, etc.) have been involved in the consultations during the scoping phase. From December 2013 to February 2014, baseline studies have been carried out engaging 21 consultations. Parallel to that, six public consultations carried out by CBG in key communities to inform them of the mine extension project. Following this, during February and March of 2014, a total of 57 consultations with stakeholders (1330 people) have been conducted during social impact assessment. In January, 2015 the final ESIA report has been published. During October, 2015 a Supplementary Information Package to the ESIA was published, stating that ESIA has been unanimously accepted. According to Environmental and social monitoring report (2021), continuous stakeholder engagement has been accomplished up to the date of the report. During the consultations, all parties involved had opportunities to voice their opinions and fears and all inputs have been collected by the team and answered by potential solutions.

For Case 2 (SML 173) four voluntary consultations have been carried out in the project planning EIA development phase during May, 2017 to inform the public, raise awareness of the project, access the local knowledge and gather feedback. It has been followed by another four voluntary public stakeholder consultations in four townships during May, 2019 with attendance from 67 to 134 persons. According to Conrad Douglas & Associates Limited [2021], an early public involvement complies with United Nations Agenda 21: *"These consultations are also very useful to assist in developing a sustainable project since the concerns of the receptors are incorporated in the project planning phase [Conrad Douglas & Associates Limited, 2021, pp. 6–2]"*. The EIA report mentions additional four consultation meetings convened by the Forestry Department during November, 2018, meetings with South Trelawny Environmental Agency, Jamaica Environment Trusin and Windsor Research Centre in June, 2019. Later, in October, 2020, more stakeholder consultations have been conducted as pre-consultations for a following mandatory public meeting on December, 2020. It is documented in a separate report, which includes concerns raised by the pre-consultation, proof of the meetings with signatures and photos of the

participants and the mandatory (mixed-virtual) public meeting for the acceptance of EIA and a verbatim description of the meeting. In August, 2021 the final EIA report has been published. Interestingly, in November, 2021 a subsequent mandatory public meeting has been requested by National Environment & Planning Agency to inform and consult about the changes in the original mining project, which has been made due to the public involvement, indicating an effective stakeholder engagement.

Lastly, according to the EIA report for Case 3 (Outer Valley), *"Public participation to date has been by way of a socio-economic study as well as interaction with the community during air and water quality monitoring as well as noise level assessment. The biological study also involved informal interaction with the communities within the study area" [EnviroPlanners Ltd, 2022, p. 24]*. According to the report, the socio-economic study has taken a form of survey, questioning 220 local residents and it has been used to inform the local communities about the project, as well as collect feedback on it, however, it does not specify how it has been done. The report mentions interviews of the key stakeholders during August, 2020. As it seems that the report is in the final draft stage, it is also stated in that public meeting will be planned in the future. However, there is an additional report with a verbatim description of the mandatory public consultation for the EIA acceptance held in March, 2022.

Regarding the stage of the report, it is visible that the public involvement in Case 3 is less developed and described compared to Case 1 and Case 2. Furthermore, the surveys of Case 3 which seem to be the first communication with the local communities, has been carried out by students from the St. Elizabeth Technical High School, supported by two members of staff, while, for example, the team of Case 1 consists of international, national experts accompanied by an international human rights expert.

Based on the analysis, it appears that there is a connection between early and effective public involvement and the quality of the EAs. Even though both Case 2 and Case 3 are located in the same country and following most of the same legislation, there is a clear difference between the reports and their quality. Speaking of the Case 1 and Case 2, the stakeholders are approached early in the EA stages, therefore having an impact on the rest of the project. The comments and fears of the stakeholders are collected and addressed in the reports. Moreover, the "high quality" case goes further than the other two cases by developing and following a Stakeholder engagement plan.

Besides that, there is a noticeable difference in the transparency regarding the consultations. All cases have additional documentation of the consultations, however, they are displayed differently and of various detail. For CBG mine (Case 1), the stakeholder meeting are processed and published in a compressed way, which is logical for the amount of consultations they have carried out. However, for SML 173 assessment, documentation includes proof (pictures, signatures etc.) that the meetings have been conducted, as well as full transcriptions of the mandatory public meetings. In case of the Outer Valley mine (Case 3), the only meeting that is documented is the mandatory public meeting for the acceptance of the EIA, which can raise questions of the quality and validity of the assessment, or at least, the quality of stakeholder engagement.

For a qualitative stakeholder engagement, it is necessary to consult the local communities

to harness the local knowledge and increase the quality of the chosen mitigation measures [Vanclay et al., 2015]. It can be observed from the document analysis that the feedback from the public meetings has been collected and in Case 1 and Case 2, also addressed, which illustrates the quality of public participation. Even though the EA reports and the presentations for the public meetings present a wide assortment of environmental and social impacts, the concerns and fears of the public are concentrated on several issues and problems. The most common ones are summarised in Figure 7.5.

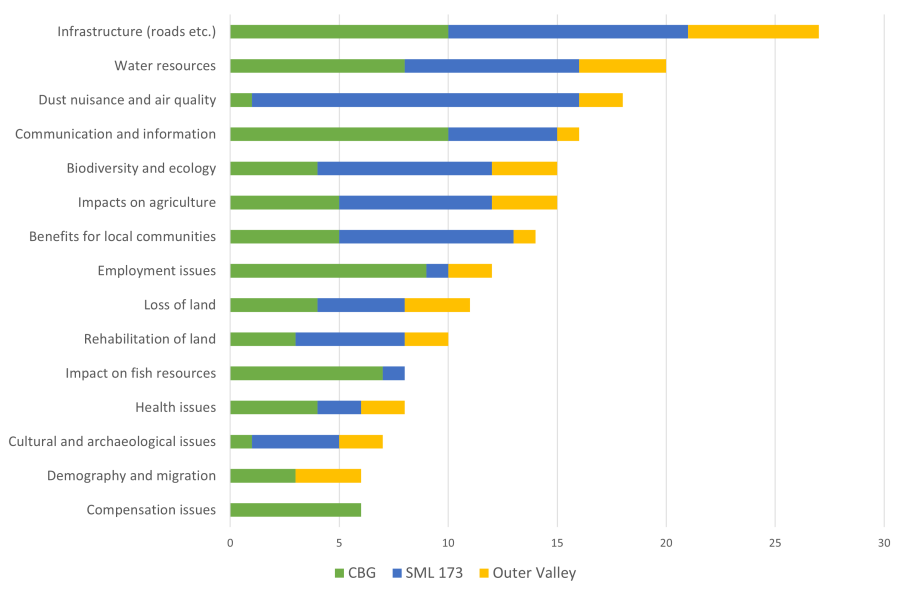

Figure 7.5. Concerns raised by the stakeholders

As Figure 7.5 illustrates, most public concerns are directed to infrastructural problems, from which a large share is about the quality of the roads in the project's area. It has been voiced in all three cases, for example, a comment from a concerned citizen from Case 2: *"When we look at our road infrastructure of this area where mining has been taking place, is a disgrace. We want to know what happen to those funds? Where is it spending? Why it is not spending on our roads? All we need over here is – Our major problem is our roads"* [Conrad Douglas & Associates Limited, 2020, p. 6]. The subject also reflects in the mitigation measures that can be seen in Figure 7.1.

Regarding water quality and supply public has demonstrated their concerns in all three cases. Their concerns have been met on some level by recommendations and mitigation measures, such as digging wells, creating buffer zones, as well as paying taxes (or royalties) to the affected communities for the extraction of their resources.

The air quality, connected to the dust nuisance from the bauxite mining process, is another major issue for the public. Furthermore, the worry about these issues can be seen in the nature of the comments, e.g.:

"They speak of the dust where the respiratory system is concerned, the infertility of their lands. So, that model that you have done if it's the same one here, for Trelawny, God help us!" [Conrad Douglas & Associates Limited, 2020, p. 8]

"Dust suppression? How? By putting a filter over the entire area? Laughable! [Conrad Douglas & Associates Limited, 2020, p. CCXXIII]

However, the issues are taken into account and mitigation measures directed towards the dust issue varies from use of the highest class of equipment and technology during the mining process to regular watering of haul roads and dust monitoring systems.

To this extent, it is apparent that in all three cases, the main concerns of the public have been determined, indicating that the local knowledge has been assessed and used to determine mitigation measures. However, it is done on different levels which has an effect on the quality of the EA, as Case 1 and Case 2 has a higher quality of public involvement, correlating with the overall quality of the EAs. Needless to say that the public can have different (even opposite) interests and concerns, however to increase the credibility and validity of the process, a full transparency of all opinions is needed [Joyce and MacFarlane, 2001].

Next, the evidence of the level of public participation has been analysed by looking deeper in each case based on the *Public Participation Spectrum* (see Figure 6.2). The result of the evaluation can be seen in Figure 7.6.

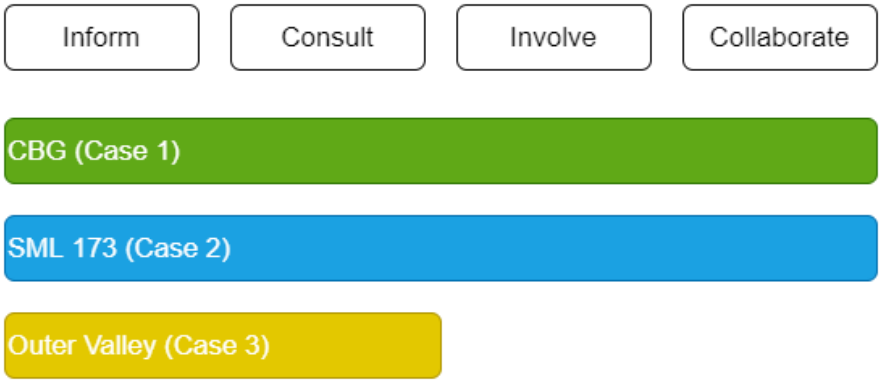

Figure 7.6. Levels of public participation found in the EA reports. Levels are inspired by Vanclay et al. [2015]

As the figure above illustrates, there is a correlation between quality and the level of public involvement. It can be confirmed that all three cases has *informed* some part of the public about the mining projects by brochures, field trips and digital documents. Yet, it is not always clear to what level they have been informed. In the best case scenario (Case 1), the EA practitioners have developed a stakeholder engagement plan and kept a track on the degree each stakeholder has been informed about the project. Both in Case 1 and Case 2, the presentations of the public meetings have been attached to the reports. However, as described in section 6.2, just informing does not increase quality, as there is no feedback [Bonde and Cherp, 2000].

Similarly, all cases have been *consulted*, which implies that the feedback has been obtained from the involved stakeholders by conducting surveys or questionnaires, public meetings and interviews. While on different levels, but the public has been able to communicate their views or concerns, which indicates stakeholder input, therefore an increased quality

of the EA due to collection of local knowledge and data [Kørnøv, 2005].

Both Case 1 and Case 2 demonstrates *involvement* of the public, as they are engaged from the beginning of the process and their fears and concerns are reflected in the report, which can indicate a higher quality of public participation, as well as the overall quality of EA.

Collaboration is apparent in Case 1 and Case 2 during the development of alternatives. For the SML 173 mine (Case 2) due to stakeholder engagement, an alternative scenario is being used. The changes include reduction of the proposed mining area by 25% and from this area only 18% is planned to be mined. The modified area is referred to as the clawed back area. This demonstrates, how in a case where people do collaborate, people take ownership of the IA and improve the quality of inputs for the whole process, which improves the quality of the EA. Nevertheless, according to the media, part of the public was not satisfied by the reduction: *"Although the permit is for a smaller parcel of land than requested, we believe the decision of the environmental regulator is counter to its mandate to protect and preserve Jamaica's environment, including the sensitive and important Cockpit Country"* [OTFaircloughTrustFund, 2022].

As it can be concluded by the analysis of the public participation level in the EAs, it is evident that there are different levels of public participation to be found, which has an effect on the quality of the impact assessments by several ways. Public involvement helps to understand the delimit the scoping, predict and analyse the pathways of the potential impact (significance, affected party changes) and develop the correct strategies (mitigation, enhancement) [Vanclay et al., 2015]. Even though perhaps in some cases major involvement is not desirable, it can be said that just informing the public is not enough and it is desirable to aim for a level of public participation that includes feedback [Kørnøv, 2005; Joyce and MacFarlane, 2001]. Moreover, the analysis indicates that the higher amount of stakeholder consultations increases the quality, as it covers a larger audience and therefore increases the quality of the data collection.

8 Discussion

Based on the findings in the literature (3 & 5) and analysis (7), this chapter aims to discuss ways how to improve quality within SIA. It is important to understand that quality is a holistic concept that consists of diverse indicators that affect it. However, the discussion is focused on the factors that have been noticed during the project.

As it has been mentioned in Chapter 3, there are various regulations, guidelines and standards that applies to a particular cases. However, as [Esteves, Franks, and Vanclay, 2012] points out, due to the narrow capacity of regulators and the lack of resources that are dedicated to quality control, a common practice is to generate assessments that meet the minimum of the expectations of regulators. That indicates, that a way to improve quality of EAs is to increase the minimum requirements with a regulatory push. It can be clearly seen during analysis how the quality level of SIA increases when it has to meet requirements and expectations of an international financial institution. Indeed, in Case 1 (CBG project) in Guinea where the project had to meet IFC Performance Standards to receive funding, the quality is a share higher than the rest of the analysed cases. Furthermore, according to Vanclay [2020], SIA should be viewed as a management tool for social issues and not just as a regulatory tool to achieve "go" or "no go" decisions. It can be implied that Case 1 and Case 2 represents the choice of management, as they focus on handling social affairs and minimising the burden on local communities throughout the project, while Case 3 seems to have the regulatory objective to pass or not pass, as the focus on managing social issues is a large share smaller than the other two cases.

According to European Commission [2009], another course of improving quality in EAs is to pay attention to the consultants and the knowledge of the practitioners, including: *"proper accreditation of consultants that undertake EIA work; preparation of reports by independent consultants; use of independent external review or expert assistance (...)"* [European Commission, 2009, p. 6]. Indeed, the quality of an SIA can be increased by choosing practitioners with a professional value system and competent knowledge of social issues [Vanclay et al., 2015]. As observed amid analysis, in Case 1, a team of professionals with a significant experience have made the assessment, collaborating with a consultancy that specialises in social sciences. Similarly, for Case 2, a company with an over three decades of experience in IAs in the mining sector achieved a decent level of quality. However, in Case 3 the consultancy without a web page and an EIA study team, judging from their qualifications, raises doubts about their knowledge in social sciences. As one can see, the awareness and knowledge of social aspects can limited and especially critical if the SIA is part of an EIA. Furthermore, the problem of knowledge is also reflected by Vanclay [2020], stating that there are concerns regarding the knowledge of the technical staff of the projects.

Another issue, that can be related to the capabilities and prioritisation choices of the practitioners, is the focus on biophysical impacts during EAs [Esteves, Franks, and

Vanclay, 2012]. According to the article, it has been a continuing practice to devote more resources to assessing biophysical impacts compared to social issues. As Du Pisani and Sandham [2006, p. 709] comments: *"This type of approach has led to the misconception that consideration of social e ects is only necessary if these result from environmental impacts"*. To raise the quality of EAs, an equal (in some cases even higher) distribution of attention to social impacts in comparison to biophysical and economic impacts is necessary [Du Pisani and Sandham, 2006]. In this project, the level of commitment to social impacts is already visible by the type of the assessment that is conducted: in Case 1 it is an ESIA, and in Case 2 and 3 - an EIA. Indeed, the narrow focus on social concerns is visible in Case 2 and even more in Case 3, which reflects on the quality of these IAs. Perhaps, it is a matter of resources dedicated to the social part of the EAs, which is also mentioned in Case 1 report. However, it is within the power and competences of SIA project managers to gather the necessary funds for it [Wong and Ho, 2015].

As it can be seen from the screening part of the analysis, half of the analysed cases do not even mention scoping as a part of the project. Even though many authors (e.g., [Lyhne et al., 2016; Vanclay et al., 2015] underline the importance of it, it is not always done and when it has been done, the scoping report is not publicly available. From the analysed cases, only Case 1 mentions scoping and also includes it in the final ESIA report. In Case 2 and 3 scoping is not mentioned, however, there are indications that scoping related activities could have been involved in early stages of the Case 2. A good SIA practice recommends to go through the scoping phase, as it aims to assess the main social and human rights issues that have to be taken into account. It helps the practitioner to investigate the context of the project and the affected parties [Vanclay et al., 2015]. European Commission [2009] also highlights the need for a mandatory scoping as a way to improve quality of the EA process and IAIA [2018] states that certain issues that might appear if scoping is not done, including delays in the project, generation of extra costs and reduced IA efficiency.

9 Conclusion

With the demand for aluminium growing, and the fact that the traditional alumina mining from bauxite generates a notable social impact on the local communities, it is important to assess and manage these impacts. SIA is the most frequently used tool to manage the social impacts of mine related operations, however, there are concerns of the quality of the practice. Thus, a following research question was formulated:

What is the state of quality of Social Impact Assessment in the field of bauxite mining and how to improve it?

The study formulated and answered two sub-questions. First sub-question was proposed to investigate what is the quality of SIA in the bauxite mining sector. To answer that, a conceptual framework was developed to analyse EA reports.

First, an initial screening of six EA reports was carried out to evaluate the overall quality of the EAs. Keeping in mind that quality is a holistic concept, consisting of various indicators that can have various perceptions, based on the person [Lyhne et al., 2016], the evaluation of quality on 20 different criteria, inspired from a checklist for evaluating a good SIA practice. The results suggest that the overall quality of EAs undertaken for bauxite mining projects is of good quality, as half of the assessed reports received a good quality score, two were evaluated as medium quality and one - as bad quality. Nevertheless, the screening reveled certain areas of EAs that could be handled better: a proper identification of stakeholders, identification of different social groups, description of the data collection, early public involvement in project, providing evidence of actually involving the public, carrying out the scoping process, including enhancement measures, establish of grievance mechanisms and define clear roles and responsibilities. To add substance of these claims, two quality indicators were selected for an in-depth analysis.

Second, based on the initial screening and knowledge from literature, three cases of various quality were selected to analyse mitigation measures and public participation. The results indicate that there are some distinct issues that has an impact on the EA quality.

The document analysis for regarding mitigation indicate that there are inconsistencies of mitigation measures compared to the mitigation hierarchy. Indeed, most mitigation measures in the reports seek to minimise impacts instead of avoiding them. Moreover, even though the methodology of defining mitigation measures in all cases included enhancement of positive impacts, in reality only in Case 1 (CBG mine extension) a couple of enhancement measures were planned. From the positive side, in all cases mitigation measures were proposed and the wording of them distinctly showed commitment to follow through by using phrases as "must/have to/will". It should be noted that regarding mitigation

measures, it is hard to separate quality and effectiveness of en EA, as managing of social impacts is the key of an IA [Vanclay, 2003].

Regarding public participation, the results show various commitments to public involvement. As one of the factors influencing a qualitative public involvement is to carry it out early in the project phase, the analysis showed that, indeed the case with high quality, as well as with medium quality had in fact engaged the public in early phases of the project (scoping), while in the case with a bad quality assessment, public participation had started later in the process. Moreover, the results showed that there is a correlation between the amount of consultations and the quality, as Case 1 had the highest amount of consultations, Case 2 - less, and Case 3 - the smallest amount. Besides that, there is a noticeable difference in the transparency regarding the consultations, Even though, all cases have additional documentation of the consultations, they are with various detail. Case 1 was the most documented one with numerous chapters and annexes, displayed in a compressed way, while in Case 2, documentation includes proof (pictures, signatures etc.) that the meetings have been conducted, as well as full transcriptions of the mandatory public meetings. And, in Case 3, the only meeting that is documented is the mandatory public meeting for the acceptance of the EIA, which can raise questions of the quality and validity of the assessment, or at least, the quality of stakeholder engagement. It was also visible that in all three cases, the main concerns of the public have been collected, indicating that the local knowledge has been assessed and used to determine mitigation measures. However, it is done on different levels. Results illustrated that all cases had informed and consulted the impacted actors, indicating a gathering of the local knowledge and data to increase the quality of an EA. In Case 1 and Case 2 public involvement was present, indicating that the inputs had an effect on the EA, therefore also heightening the quality. Based on this, it was concluded that informing the public is not enough and it is desirable to aim for a level of public participation that includes feedback such as consultations.

Lastly, various improvements were defined to answer the second sub-question of how to improve quality of SIAs. First, based on the document studies, it can be concluded that a well balanced report with a logical structure and non-extensive size can improve the evaluation process. Second, by combining knowledge from literature and observations from analysis, following actions were suggested to improve quality: a regulatory push by increasing the minimum requirements for an SIA, paying attention to knowledge and qualifications of the EA practitioner, making sure that the biophysical impacts are not favoured over the social impacts and including scoping as a part of the project.

Future research may investigate other quality indicators to get a holistic view of SIA quality in bauxite mining sector. Future studies might also consider exploring the connection between quality and effectiveness, as without one concept there might not be the other.

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