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FROM BUILDING LEGITIMACY TO BUILDING NETWORKS: RECONCEPTUALISING THE SOCIAL LICENCE TO OPERATE IN THE CONTEXT OF DEEP OFFSHORE MINING

by

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ABSTRACT

As the global demand for metals grows and terrestrial sources become more difficult to access, it seems inevitable and, arguably, vital that the mining industry will turn to the oceans in order to meet the demands of growing populations and global industrialisation.

In 2011, the government of Papua New Guinea granted the world's first commercial-scale deep offshore mining licence to Nautilus Minerals. The mine, Solwara I, in the territorial waters of Papua New Guinea, is therefore a trail-blazing project at the threshold of a frontier industry.

Thus far, very little has been written about the social impacts of deep offshore mining. This dissertation investigates the role of the social licence to operate in the context of this nascent industry, with particular reference to Solwara I. Lessons learnt regarding the social licence to operate are extrapolated to the context of deep offshore mining.

An overview of the evolution of the social licence to operate in terrestrial mining, from its emergence as a concept underpinning community engagement around mining operations, to its anticipated role in deep offshore mining, is presented. The affected communities of deep offshore mining are no longer bound by geographical location and are therefore more appropriately characterised as stakeholders.

Turning to Solwara I, specific aspects of the stakeholders around the project are presented. It is shown that the fragmentation and volatility of the context around the mining operation present challenges to building social capital, necessary to earning and maintaining a social licence to operate.

Within the Solwara I context, in the minds of stakeholders, the roles of the government and the company are conflated, with the social licence to operate also being influenced by perceptions of legitimate benefits. It is shown that, currently, Nautilus Minerals probably does not have a social licence, although, taking a longer-term perspective, its social licence to operate has hovered around the acceptance level over the past five years.

It appears though that the apparent absence of a social licence to operate does not seem to be playing a determining role in the Solwara I project. This may be attributable to the limited spatial and temporal scale of the project. However, in the future of deep offshore mining, projects and their impacts are likely to be longer term, with the social licence to operate anticipated to play a key role. Earning and maintaining a social licence to operate in the emerging industry of deep offshore mining will most likely entail establishing interdependent networks of stakeholders in the pursuit of sustainable outcomes.

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LIST OF ACRONYMS

ADB	Asian Development Bank
BHRC	Business & Human Rights Resource Centre
CAB	Coastal area of benefit
CIA	Central Intelligence Agency
CMJ	Canadian Mining Journal
CSR	Corporate social responsibility
DMPGM	Department of Mineral Policy and Geohazards Management
DNPM	Department of National Planning and Monitoring
DOM	Deep offshore mining
DSM	Deep sea mining
EEZ	Exclusive economic zone
EIS	Environmental Impact Statement
EITI	Extractive Industries Transparency Initiative
EIU	Economist Intelligence Unit
EU	European Union
FPIC	Free, prior and informed consent
HDI	Human Development Index
HRW	Human Rights Watch
ICMM	International Council on Mining & Metals
ISA	International Seabed Authority
MOU	Memorandum of understanding
MPI	Mineral Policy Institute
MRA	Mineral Resources Authority
NGO	Non-governmental organisation
OBG	Oxford Business Group
PANG	Pacific Network on Globalisation
PIANGO	Pacific Islands Association of Non-governmental Organisations
PNG	Papua New Guinea
PNGMW	Papua New Guinea Mine Watch
RSF	Reporters without Borders
SDG	Sustainable development goal
SLO	Social licence to operate
SMS	Seafloor massive sulfide
SPC	Pacific Community
StaRS	Strategy for Responsible Sustainable Development
TI	Transparency International
UN	United Nations
UNDP	United Nations Development Programme

KEYWORDS

Deep offshore mining
Hydrothermal vent
Nautilus Minerals
Papua New Guinea
Social capital
Social licence to operate
Solwara I
Stakeholder
Wantok

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CHAPTER 1. INTRODUCTION

1.1 Background

Mining operations have the potential, especially in resource-rich developing countries, to make an incisive contribution to economic development and poverty reduction. Paradoxically, the opposite effect has often been borne out, with mining in these countries all too often having unleashed far-reaching social and environmental disruption and economic instability (Natural Resource Governance Institute, 2015). While the resource curse is steeped in a mire of interwoven factors, there is a growing acknowledgement that transparency, accountability (Extractive Industries Transparency Initiative (EITI), 2016) and credibility (Mining Association of Canada, 2018) in the governance of mineral resources are key to the sustainable exploitation of these countries' mineral wealth. Moreover, there is a growing recognition by mining companies of the need to align their operations with the tenets of sustainable development (Boutilier, 2009; Bice, 2014).

It is within this context that these companies increasingly acknowledge the importance of obtaining, in addition to the legal licence to mine, a social licence to operate (SLO) from the community affected by their operations (Prno and Scott Slocombe, 2012). Thus, the SLO marks a shift which sees communities who have traditionally borne the brunt of mining operations to becoming stakeholders of these projects.

Although the SLO has an established history of just over twenty years in the context of terrestrial mining (Cooney, 2017), the concept still regarded as "emerging" (Boutilier, 2009). Nevertheless, EY (2018) identify the SLO as among the top ten risks faced by mining operations over the past decade. Thus, this dissertation will interrogate the possibility of extrapolating the role of the SLO to the "emerging" frontier of deep offshore mining (DOM) in the territorial waters of countries (and, by extension, deep sea mining (DSM)), with specific reference to the Solwara I project in the exclusive economic zone (EEZ) of Papua New Guinea (PNG).[1] Nautilus Minerals, a Canadian company, holds the mining licence for this site.

[1] Deep sea mining is usually associated with the Area, the part of the ocean which falls beyond the limits of national jurisdiction (United Nations (UN), 1982). The Area is under the jurisdiction of the International Seabed Authority (ISA). Traditionally, the deep sea refers to places where the seabed is situated at depths of 200 metres and below, although the ocean at its deepest point is just under 11 km deep – at the Mariana Trench in the western Pacific (The Conversation, 2016). However, given the narrow continental shelf of PNG, the deep sea is situated relatively close to the coastline and, thus, Solwara I, although its operations will take place in the deep sea, is located within the national jurisdiction of PNG, in an area denoted the EEZ (UN, 1982). This dissertation will distinguish between territorial deep offshore mining (DOM) and deep sea mining (DSM) within the Area in acknowledgement of the different jurisdictions regulating these operations.

Aspects of the Solwara I project, as these impact on the SLO, will be discussed. Although no commercial-scale DOM operations have, as yet, taken place, DOM in Melanesia is predicted to commence in 2019–2020 (Cuyvers *et al*., 2018). Finally, an attempt will be made to extrapolate findings from the Solwara I study regarding the SLO to the nascent industry of DOM.

It is against this background that the following research questions have been formulated:

1.2 Primary research question

- What is the potential role of the social licence to operate in deep offshore mining operations?

1.3 Secondary research questions

- What are the specific characteristics of the social licence to operate in the context of deep offshore mining?
- What is the context of the Solwara I project in Papua New Guinea?
- What is the role of the social licence to operate in the context of the Solwara I project?
- What role will the social licence to operate play in future deep offshore mining projects and what lessons can be learnt from the Solwara I case study?

The objectives below are formulated in view of answering the above primary and secondary research questions.

1.4 Objectives

- To define the characteristics of the social licence to operate in the context of deep offshore mining.
- To define the characteristics particular to the Solwara I project in the territorial waters of Papua New Guinea.
- To determine the role of the social licence to operate in the Solwara I project and to identify possible lessons for the future.

1.5 Methodology

This study is based on an extensive literature survey of journal and newspaper articles, blogs and reports. Reference is made to press releases and notices released by Nautilus Minerals on their website, www.nautilusminerals.com. Statistics pertaining to PNG were obtained from data published by various international organisations, such as Transparency

International (TI), the Economist Intelligence Unit (EIU), The Oxford Business Group (OBG), Country Watch, Reporters without Borders (RSF) and the UN Human Development Index (HDI).

The national PNG newspaper, The National, and various blogs and Facebook pages, were consulted to obtain the viewpoints of the affected stakeholder groups in East New Britain and New Ireland Provinces. Information was also obtained from international newspapers, news sources and international environmental and mining magazines.

1.5.1 Parameters

Given the diversity and complexity of the stakeholders of the Solwara I project, it is beyond the scope of this dissertation to undertake an exhaustive analysis of all the elements of the Solwara I stakeholder network. Therefore, the focus of this dissertation is on the communities of East New Britain, New Ireland and on the operating company, Nautilus Minerals. Reference will be made to the government of PNG, and to environmental and economic aspects of the project only insofar as these impact on interactions of the company and the communities of East New Britain and New Ireland.

1.5.2 Limitations

In some instances, the analysis of online sources was challenging, as information obtained, even from reliable sources, contains significant variations. For example, the Central Intelligence Agency (CIA) (2018) and Country Watch (2018) report population statistics for PNG of 6 909 701. The World Bank (2018) estimates a figure of “almost 8 million” and the World Population Review (16 June 2018) reports a figure of 8.42 million. The variances in these figures reflect the challenges inherent to reporting precise, verifiable information about a country where 85% of the population live in remote, “far-flung” rural areas and in “fragmented social groups, with more than 800 ethnic groups speaking over 800 languages” (World Bank, 2015).

While it was endeavoured to consult only reliable sources, communications by community groups in PNG are often published only on social media — on Facebook and in blog posts. At times, it was unclear who the responsible agents behind these posts are. Clearly, anonymity has an impact on accountability and, as a consequence, on the SLO.

1.6 Relevance of the study

As the global demand for metals grows and terrestrial sources become more difficult to access, it seems inevitable and, arguably, vital that the mining industry will turn to the oceans

in order to meet the demands of growing populations and global industrialisation (Yeats, 2012). Indeed, to date, the ISA (2018) has extended 29 exploration licences in the deep ocean. However, the nascent industry of DSM is fraught with uncertainties and risks. For this reason, Solwara I is a trail-blazing project. It has the opportunity to establish best industry practice in this frontier industry in regard to technology, obviating the “costly environmental and social mistakes” of terrestrial mining (Clouse, 2017). Although the putative environmental and commercial and legal impacts of deep offshore and DSM have been debated extensively, very little has thus far been written about the social impacts of deep offshore/sea mining. By investigating the role of the SLO in the Solwara I context, it is hoped that this dissertation will make a contribution to the debate.

1.7 Chapter overview

Chapter 2 will present an overview of the evolution of the SLO, from its emergence as a concept to frame community engagement to its anticipated role in DOM operations. Consideration will be given to ambiguities around the definition of the concept as well as the community presumed to be affected by such mining operations. The implications of these issues will be discussed in respect of DOM. The informal, intangible and fluctuating nature of the SLO will be juxtaposed with the formal, legal, more permanent content of the licence to mine issued by the government. Boutilier and Thomson's theoretical model of the SLO (2011) will be presented, leading to a reframing of the concept of the “affected community” as a “stakeholder network”.

Chapter 3 will consider specific aspects of the stakeholder network most closely involved with the Solwara I project in PNG. An overview of pertinent elements concerning the country and the impacts of previous (terrestrial) mining operations will be presented. A brief overview of the Solwara I project and the company, Nautilus Minerals, as well as the complex stakeholder network of the East New Britain and New Ireland Provinces will be presented, followed by a discussion of the governance, economic and cultural impacts of the Solwara I project.

In chapter 4, an integrative analysis of the role of the SLO in the context of Solwara I will be presented. In this regard, aspects of the social, environmental and economic impacts of Solwara I, as these impact on the role of the SLO, will be considered. Ultimately, questions around who the “licensors” are and what the “licenseable” operations around Solwara I are are raised. Stakeholder communication, focussing on free, prior and informed consent (FPIC) will be discussed. Similarly, environmental and economic impacts on the stakeholder network

will be considered in order to highlight the interwoven nature of the stakeholder context in which the SLO operates.

In conclusion (chapter 5), it is argued that the prerequisites of transparency, accountability and credibility are equally important to the sustainability of terrestrial and marine mining. Therefore, stakeholder approval of DOM operations, in the form of an SLO, will remain a key constituent of their viability. Indeed, given the dispersal of stakeholder networks of DOM (and DSM), it is perhaps more important than ever to build strong networks around these operations.

1.8 Conclusion

This chapter presented an overview of the dissertation, outlining the aims and objectives of the research project as well as the associated primary and secondary research questions. An overview of the methodology and an outline of the parameters and limitations of the study were given. The study was contextualised by highlighting its relevance in view of the expectation that commercial-scale DOM will soon commence.

CHAPTER 2. THE SOCIAL LICENCE TO OPERATE

2.1 Introduction

This chapter presents a discussion of the SLO. The theory of the concept will be traced, from its origin, in the late twentieth century, to its present role as a framework for the dialogue between mining companies and the communities affected by their operations (Owen and Kemp, 2013). A definition of the SLO will be given, as well as a consideration of how the concept may be applied to the emerging landscape of DOM.

2.2 Origin of the SLO

The term “social licence to operate” was coined by Jim Cooney during a “small conference” (Cooney, 2017) with officials from the World Bank (Bursey and Whiting, 2015). From there, the term rapidly gained currency, although the precise meaning of the SLO largely remained “intangible” and “impermanent” (Nelsen, 2006). Cooney had intended the SLO to denote a mechanism to manage socio-political risk at a local level and, recently, expressed surprise that the term has become a “major reference point in the discussion about the relationship between mines and communities” (Cooney, 2017). He had intended the concept merely to highlight that mining operations are subject to two separate approval/licencing processes.

The first entails obtaining the government licence to operate a mine. This authorisation, which needs to be acquired once only before the start of operations, is codified in a legal document stipulating minimum levels of operational performance with due regard for standards pertaining to the preservation of human health and safety and the environment (Cooney, 2017). The suspension of the mining permit by the government leads to the cessation of operations.

The second process entails engaging with the local community in order to gain their approval of the mining operation. This approval, once gained, is embodied in an SLO (Cooney, 2017). However, the SLO, unlike the legal mining permit, is not encoded in a document. Black (2013) defines authentic stakeholder engagement as “listening, keeping promises, and committing to fair and transparent processes and consistent behaviour”.

The SLO denotes a community’s intangible, fluctuating and impermanent acceptance of mining activities. Although the SLO takes many years of relationship and trust building to establish, it can be lost very quickly (Lacey *et al*., 2012). Thus, Cooney (2017) concedes that the term is necessarily “nebulous”. The term “licence” had been chosen for its “verbal

parallelism" with the mining permit and was intended to highlight that lack of community support would lead to the suspension of the SLO (Cooney, 2017). Although the withdrawal of the SLO itself bears no legal force, when communities block mining operators' access to resources, this may well have dire consequences, potentially leading to significant financial losses, violence, loss of life and the cessation of operations (Tlozek, 2017; Boutilier and Zdziarski, 2017).

The SLO had originally been conceived as an analogy/metaphor for managing risks at the community level as well as at the government level (Boutilier *et al*., 2012; Bice, 2014; Cooney, 2017). In this regard, the SLO is a metaphor for the licence/ability of a community to approve or withdraw support from a mining operation (Boutilier *et al*., 2012).

Cooney (2017) had never intended the concept to be used prescriptively for the relationship between the community and the mining company. The SLO had been conceived to describe the reality "on the ground" faced by mining companies in the context of their operations and the impacts of these on the local community (Cooney, 2017). Therefore, the SLO may be regarded as "shorthand for a more complex situation" (Boutilier and Thomson, 2011). In order for the SLO to be used meaningfully to inform stakeholder relations around mining operations, especially in view of the emerging industry of DOM, the concept needs to be clearly circumscribed to make a meaningful contribution to stakeholder discourse (Bice, 2014; Bursey and Whiting, 2015).

2.3 Evolution of the SLO

At the end of the twentieth century, Cooney (2017) forecast that accelerating globalisation would significantly impact the socio-political risk profile of mining operations. Mining operators were increasingly venturing into the developing world, thereby exposing their operations to "significant uncertainty" in terms of how affected communities and governments would respond to these, long term. In this context, Cooney (2017) envisioned the SLO as a way to mitigate socio-political risk by reducing uncertainty regarding the long-term treatment of foreign-operated mining operations by affected communities.

Globalisation also brought with it a communications revolution which has had the effect of connecting remote communities (where the mining operations are often located), in the past perhaps neglected by their national governments, with international watchdogs, civil groups and the media (Cooney, 2017).

As a result, in the twenty-first century, mining impacts in remote corners of developing countries have been placed under the instant scrutiny of the world (Cooney, 2017).

Concomitantly, the SLO, although still serving as the basis for a dialogue between mining companies and local communities, has also been propelled onto a global stage.

The SLO appears, as a result, to have developed along two trajectories.

2.3.1 Management tool

In order for a mining company to obtain and maintain an SLO, it is essential to earn the trust of the community, based on ongoing communication and transparent disclosure of information (Moffat and Zhang, 2014). Given the long-term lifespan of a typical terrestrial mine often of several decades, earning and maintaining an SLO is a long-term objective. In this regard, the SLO as a stakeholder management tool is said to offer the company the best hope of achieving "global as well as organizational sustainability" (Prno and Scott Slocombe, 2012). Thus, the SLO, from the perspective of the mining company, provides a means of reconciling the outcomes of the operation to the expectations of its affected community on a local and global scale. Interestingly, Moffat and Zhang (2014) found that the quality of community engagement, rather than the quantity, is the better predictor of whether an SLO has been earned. However, while the SLO takes a long time to build, it can be lost quite abruptly. Indeed, it is often easier to assess when an SLO has been lost than to judge whether it is in place (Bursey and Whiting, 2015). Stakeholder management (cf. 2.4) based on trust, mutual respect and transparent disclosure has the potential to offer a "high capacity for collaboration" (Boutilier and Zdziarski, 2017). From a business perspective, therefore, there is a strong case to be made for earning and maintaining an SLO, as this will greatly facilitate operations.

2.3.2 Governance tool

Globalisation has had led to increased participation by communities in mining operations with challenges to mining operators to go beyond their traditional voluntary corporate social responsibility (CSR) initiatives. The SLO arose in the mining industry at more or less the same time that mining operators started adopting CSR practices. While the SLO may be viewed as the operational embodiment of the CSR (Bice, 2014), both concepts were developed as a result of pressure by communities on mining companies to embrace sustainability practices (Prno and Scott Slocombe, 2012). The CSR and the SLO are not equivalent, though. While both are voluntary initiatives, a company's self-imposed CSR policy does not automatically earn it an SLO. Moreover, its CSR does not require approval from the community. It is only when the community, bolstered by global civil groups, non-governmental organisations (NGOs) and other allies, feel that they are "heard, understood and respected" and receive a "fair share of benefits from mining projects" that they are likely to issue an SLO (Nelsen, 2006).

Moreover, communities are increasingly demanding more than just jobs, such as participation in and a share of the success of mining projects and empowerment opportunities (Black, 2013; Prno and Scott Slocombe, 2012).

Another important community-level governance measure influencing decision making around mining operations is the principle of FPIC.[2] Article 32(2) of the UN Declaration on the Rights of Indigenous Peoples (UNDRIP) places an obligation on states to "consult and cooperate" with indigenous peoples (UN, 2007). In terms of UNDRIP, the rights of indigenous peoples as regarded as inherent and therefore not "determined or denied by legislation, or any nation state" (Indigenous Rights and Resource Governance Research Group, no date). In addition, there is a recognition the highest standard of FPIC entails ongoing "consultation and consent confirmation" (Indigenous Rights and Resource Governance Research Group, no date).

Globalisation has given a wider range of stakeholders a voice in mining operations. Indeed, it may be said that sustainability issues are too complex to be subject to one form of governance only (Prno and Scott Slocombe, 2012). In the absence of a global regulatory authority for terrestrial mining and DOM operations, mining companies are held to account by a number of voluntary reporting measures, such as the Global Reporting Initiative, the EITI and the UN Global Compact (Bice, 2014).

2.4 Stakeholder engagement

The SLO is granted by an "affected" community — that is, a community impacted by (mining) operations. However, the term "community" tends to mask the heterogeneity of the group. For this reason, Boutilier and Thomson (2011) prefer to use the concept of a "network of stakeholders". Although stakeholders may all have an interest in the same project, this does not mean that they all have the same agenda; for example, they may not all agree on the status of the SLO to be granted to the company, or whether one should be granted at all, for that matter (Boutilier and Thomson, 2011).

The notion of the SLO presupposes the ability to grant or withhold an SLO. Not all stakeholders in the network have equal power in this regard. By framing SLO discourse within a stakeholder network, it becomes apparent what the stakes are and who the holders of these stakes are (Boutilier, 2009). The stakeholders decide on the degree to which they oppose or

[2] This requirement, traditionally imposed on governments rather than mining operators (Bursey and Whiting, 2015), will be discussed in 4.2.

give their support to an operation, based on how they weigh the positive and negative impacts they are experiencing or based on their anticipation of these impacts over the projected course of the project (Boutilier and Zdziarski, 2017). Moreover, stakeholders form coalitions and alliances, both among themselves and with allies beyond the local context. By harnessing coalitions within this wider network, stakeholders increase their ability to hold the company to account (The World Bank Group, 2001; Boutilier and Zdziarski, 2017). From the company's perspective, earning an SLO from stakeholders with disparate interests, in different geographical locations and with differing interests, is challenging.

Local-scale stakeholder engagement around relatively remote projects is propelled onto the world stage, as more people around the world perceive themselves as stakeholders in these projects. In the case of trail-blazing projects, this is all the more true because there are several stakeholders with an interest in the outcome of the project. With mining operations being placed under worldwide scrutiny, mining companies are being held to account, not only for their mining operations, but also for their stakeholder engagement (Deloitte, 2011).

2.5 A four-tiered model

In their pyramid model (Figure 1), Boutilier and Thomson (2011) define the SLO as a "community's perceptions of the acceptability of a company and its local operations". The model is underpinned by the normative components/cornerstones of legitimacy, credibility and trust, which are acquired sequentially (Thomson and Joyce, 2008; Thomson and Boutilier, 2017b).

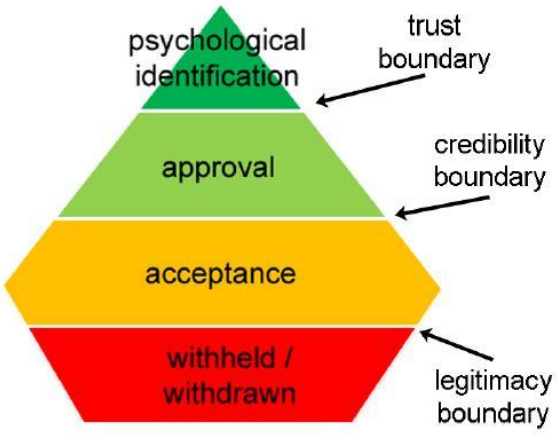

Figure 1. Boutilier and Thomson's (2011) pyramid model of the SLO.

The above model comprises four levels of SLO. The lowest level represents the highest (socio-political) risk to the company. At this level — withheld/withdrawn, which falls below the legitimacy boundary — the company does not have an SLO. At this point, the company may yet need to earn an SLO, but in the perception of the community has not yet done enough to earn it. Alternatively, according to the "withdrawn" scenario, the company may once have held an SLO, but given that something has happened to violate the trust of the community, it has been withdrawn.

At the "acceptance" level of the SLO model, the company is said to have an SLO. To attain an acceptance level, the project must be seen to be at least economically legitimate. Without economic legitimacy, earning an SLO is not possible. Acceptance at this stage is indicative of tolerance and although an SLO is in place, it is not very robust. The company is seen to operate according to the standards set by the community. A mining company earns this level of the SLO by engaging with "all members of the community", answering their questions and providing information (Thomson and Boutilier, 2017b). Clearly, engagement with "all members" of a heterogeneous group, who may not all be located in the same geographical place, is quite challenging. In practice it is more likely that stakeholder engagement will take place with a selection of representatives.

In Boutilier and Thomson's (2011) model, acceptance precedes approval, with the latter only being earned once the legitimacy boundary has been crossed. Approval cannot be won without acceptance being in place. Acceptance denotes a lower level of stakeholder sanction than approval.[3] At the approval level of the SLO, the company is seen to comply with commitments made to stakeholders (Thomson and Boutilier, 2017b). At this point, stakeholders see the project as having at least both economic and socio-political legitimacy. Although the SLO is not a documented formal agreement, it may at times be concretised as a memorandum of understanding (MOU) or a mineral development agreement, these agreements do not guarantee the longevity of the SLO. Moreover, progress is not linear; the SLO fluctuates over the course of a mining project and the issuance of an MOU in the context of the SLO is merely a marker of the SLO at a point in time. If the stakeholders perceive the mining operator at any point to be in breach of an agreement, the SLO can be withdrawn summarily. However, by documenting agreements, the scope for misinterpretation can be limited (Thomson and Boutilier, 2017b).

[3] Prno and Scott Slocombe (2012) do not appear to make a distinction between acceptance and approval. In their analysis of the SLO, twice they refer to approval as preceding acceptance, and once acceptance is listed before approval.

The highest level of SLO that can be achieved is based on social capital (or co-ownership — Thomson and Boutilier, 2017b). This level will have been achieved once the company has earned the trust of its stakeholders, which takes time to build and which signals congruency between company and stakeholder expectations (Boutilier and Thomson, 2011). Without transcending the trust boundary, the company will not be able to achieve an SLO beyond the approval tier. Trust, as a major determinant of the SLO, is largely determined by "perceptions of fairness and the quality of the contact" with representatives of the mining company (Boutilier, 2014).

At the psychological identification level, stakeholder relations will have transcended the short-term transactional level. At this point, the project is perceived to have economic, socio-political legitimacy, with institutionalised trust, or co-ownership having been achieved (Boutilier and Thomson, 2011; Thomson and Boutilier, 2017b). This level of SLO is seldom achieved, with most SLOs vacillating between acceptance and approval (Boutilier and Thomson, 2011).

2.6 The social licence to operate in the context of deep offshore mining

2.6.1 Stakeholder context

Given that anticipated DOM activities will take place within the EEZ of Pacific Island states, these operations will fall under the national jurisdictions of these sovereign states. In many cases, however, the legislative frameworks are lagging and do not yet make adequate provision for mining in the deep offshore environment (Blue Ocean Law and Pacific Network on Globalisation (PANG), 2016). However, one of the major drivers of DOM is that it offers a means of radically contributing to the economic development of these countries and it is for this reason that DOM is likely to start on a commercial scale very soon (Cuyvers *et al.*, 2018). PNG, in particular, has the potential to leverage benefits from DOM "for generations to come" (World Bank, 2017; Wakefield and Myers, 2018).

For the purposes of this dissertation, it will be assumed that the main difference between the stakeholders of terrestrial operations and those affected by DOM is that the latter do not live in immediate proximity to the mining operations. However, this does not necessarily mean that there will be "no impacts" on coastal communities (Coffey Natural Systems, 2008). Given that the most disruptive aspects of DOM mining are anticipated to occur offshore, their social impacts can at best be described as uncertain, and are likely to be informed by perceptions based on experiences of terrestrial mining (World Bank, 2017). In terms of the SLO, questions are likely to arise regarding the extent to which the stakeholders will have a say in how DOM operations are conducted. Will they, in fact have the ability to approve or veto DOM operations,

or will DOM continue regardless of the presence of absence of an SLO? In short, as Roche and Bice (2013) ask, will these stakeholders be able to “grant a social licence to operate to an industry operating not in their backyards, but in their equally prized and culturally important seas?”

2.6.2 Role of the media

The Internet and social media are undoubtedly important in influencing global perceptions of mining projects. For example, increased connectivity and media coverage have been instrumental in creating near-instantaneous global-local connections. In terms of DOM, vast amounts of data become available daily about an industry which is emerging at the same time as the information is published online and opinions are formed. For example, a Google search of “deep offshore mining” (on 23 September 2018), produced links containing the following: “possibly as damaging as land mining”, “destroys”, “dangerous experiment” “risk”, “dangers”. Lower in the list, less emotively charged links such as “technology options for deep-seabed exploitation”, “sustainable seabed mining: guidelines…” and “incorporating transparency into the governance of deep-seabed…” appeared.

A Google search is informed by a variety of algorithms, and the above example is offered merely to illustrate the entry point to an Internet search on DOM on a particular day. The barrier to publishing information on the Internet is low, with global NGOs, civil society and self-appointed watch dogs able to broadcast informed and sometimes not so informed opinions about events which often do not necessarily affect them directly using email, Facebook and Twitter. In PNG, the government has issued threats to clamp down on freedom of speech under the guise of clamping down on fake profiles (Price, 2018). Events that may have escaped public scrutiny before the age of social media are shared instantly. However, the age of social media has also brought with it the era of “fake news” and corporations scramble to preserve their reputation in the face of often unjustified assaults. Careful scrutiny of news emanating from social media is necessary in order to ascertain its legitimacy, credibility and trustworthiness.

2.6.3 Stakeholder networks

Given the wide dispersal and heterogeneity of the stakeholders of DOM, it is advantageous to view them in terms of a network. Given the early stages of development of DOM, disputes may arise regarding issues such as customary ownership and usage, cultural ownership rights and practices, spiritual connections and governance. It is possible that disputes regarding ownership may arise as a result of seabed location in the absence of adequate legislative

provisions (Roche and Bice, 2013). For example, Solwara I is already seen to impinge on "historical land tenure and fishing rights", giving rise to "discontent and conflict" among the affected PNG stakeholders (Blue Ocean Law and PANG, 2016).

The way to build, achieve and maintain an SLO in the context of DOM is by building strong social capital by developing trust and shared values across a network of stakeholders (Black, 2013). Social capital, in this regard, is seen as

> *the stock of active connections among people: the trust, mutual understanding, and shared values and behaviors that bind the members of human networks and communities and make cooperative action possible* (Cohen and Prusak, 2002).

Thomson and Boutilier (2017b) regard social capital as central to the SLO, equating the concept with "capacity building" and "institutional strengthening". Knowledge about the patterns of stakeholder patterns will inform efforts to earn and maintain the SLO. Interestingly, the term "capital" perhaps establishes a "verbal parallelism" with the minimum SLO requirement of "economic legitimacy", perhaps suggesting that the economic course of a mining project may mirror the ebb and flow of the SLO.[4]

By framing the SLO discourse as a stakeholder network, the interaction of stakeholder actions becomes apparent. Moreover, configurations within the networks are highlighted, with the company's actions seen to impact on stakeholders, and "these influences also operat(ing) on the company side" (Boutilier, 2009).

[4] "Capital" is a concept related to economics. Therefore, the state of social capital could perhaps be regarded as a metaphor mirroring the economic course of a project. More research is required to determine whether a causal link can, in fact, be established between social capital and economic performance.

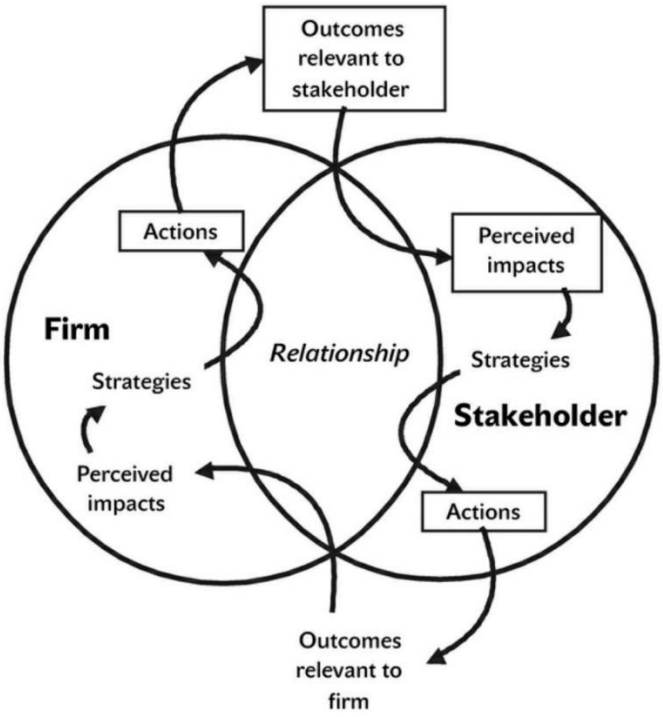

Figure 2. View of the company as part of a stakeholder network (Boutilier, 2009).

The model proposed in Figure 2 views the process of obtaining and granting an SLO as the outcome of an ongoing dialogue between stakeholders within a network around a mining operation. According to this model, the strength of the SLO is premised on a robust dialogue among stakeholders of which the mining company is part, with each entity potentially being a licensor and licensee.

Prno and Scott Slocombe (2012) caution that the SLO is not the primary goal of mining operations as these are answerable to their shareholders and are therefore driven by a "profit motive" in a "free market economy". According to Boutilier (2009), most corporations espouse the principles of "ethical and sustainable work", to which end they use the SLO to navigate a "world populated by a fantastic array of differing and competing interests – hostile activists, self-interested elites and child-like dependents".

2.7 Conclusion

In this chapter, the emergence and development of the SLO were discussed followed by a definition of the concept, as a management and governance mechanism, in the context of mining operations. The role of the Internet and social media was highlighted. Anticipated changes to the stakeholder landscape of DOM operations were discussed together with the

presentation of a model to suggest how the SLO might be reframed as a dialogue within a stakeholder network based on the principles of free speech and democracy.

In the next chapter, certain aspects of the stakeholder network of the Solwara I project, as these impact on the SLO, will be presented.

CHAPTER 3. STAKEHOLDER NETWORK OF SOLWARA 1

3.1 Introduction

This chapter will present an overview of the stakeholder network of Solwara I. An overview of the project, the socio-political context of PNG and of the coastal communities around Solwara I is given in view of contextualising the stakeholder network.

3.2 The project

In 1997, the government of PNG granted Nautilus Minerals, a Canadian company listed on the Toronto Stock Exchange, its first tenement in the EEZ of PNG to undertake exploration for seafloor massive sulfide (SMS) deposits (Nautilus Minerals, 2018g).

Subsequently, in 2007, Nautilus Minerals launched a commercial-scale exploration programme to explore the feasibility of extracting high-grade polymetallic SMS deposits from the seafloor (Nautilus Minerals, 2018g). SMS deposits are concentrated around hydrothermal vents and contain high-grade concentrations of copper, zinc, gold and silver at grades by far exceeding those of deposits found on land (Nautilus Minerals, 2018f). Clustering, as they do, around hydrothermal vents, these deposits are the marine counterparts of terrestrial volcanogenic massive sulfide deposits (Nautilus Minerals, 2018f; Toovey, 2011; Coffey Natural Systems, 2008).

Following six months of intensive fieldwork, including chimney sampling and diamond drilling around the Solwara I site, Nautilus Minerals issued a resource estimate report (Mining Technology, 2018). Findings indicated highly prospective grades of 870 000t indicated resources of 6.8% Cu, 4.8 g/t Au, 23.0 g/t Ag and 0.4% Zn. Inferred resources of 1.3 million tonnes grading at 7.5% Cu, 7.2 g/t Au, 37.0 g/t Ag and 0.8% Zn were also reported (Canadian Mining Journal (CMJ), 2007), comparing very favourably with terrestrial mines.[5]

In January 2011, the government of PNG granted the world's first DOM licence, valid for 20 years, to Nautilus Minerals, to develop Solwara I (CMJ, 2011).

The Solwara I deposit is located at a depth of 1 600m (Nautilus Minerals, 2018f), and situated at approximately 30km from the nearest coast (New Ireland Province) and 50km north of East New Britain Province in the Bismarck Sea (SYM Mining and Construction Machinery,

[5] Comparatively, Ok Tedi, a terrestrial mine in PNG, produces grades of 0.8% Cu and 1 g/t Au and has resources of 910 million tonnes (World Bank, 2016).

2018) (Figures 3a and b). The site is small, spanning a surface area of 0.112km^2 (Mining Technology, 2018). The anticipated life of mine of Solwara I is 30 months, subject to a maximum yield of 5 900t of ore per day (Mineral Policy Institute (MPI), no date).

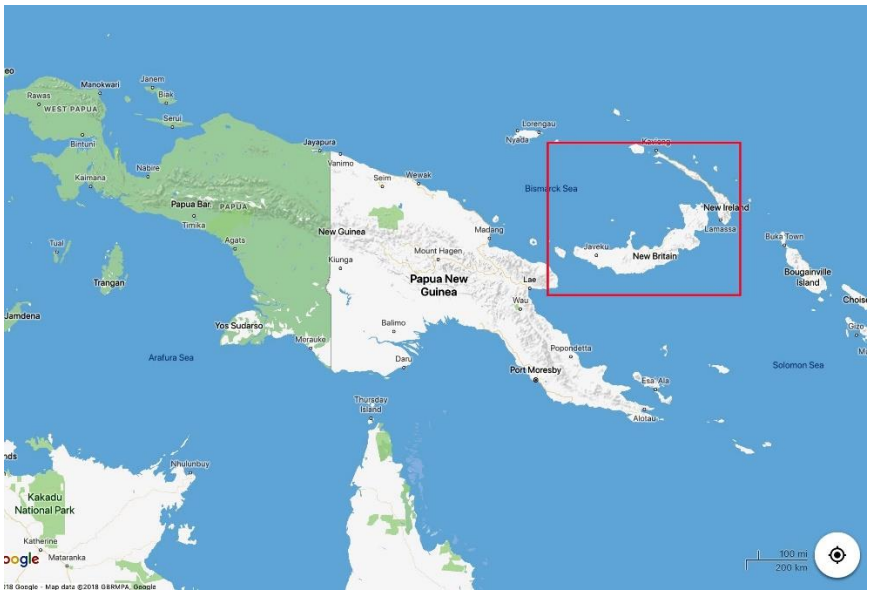

Figure 3a. Locality map of the Solwara I project in the EEZ of PNG. The inset map (3b) shows a zoomed-in perspective of the project area.

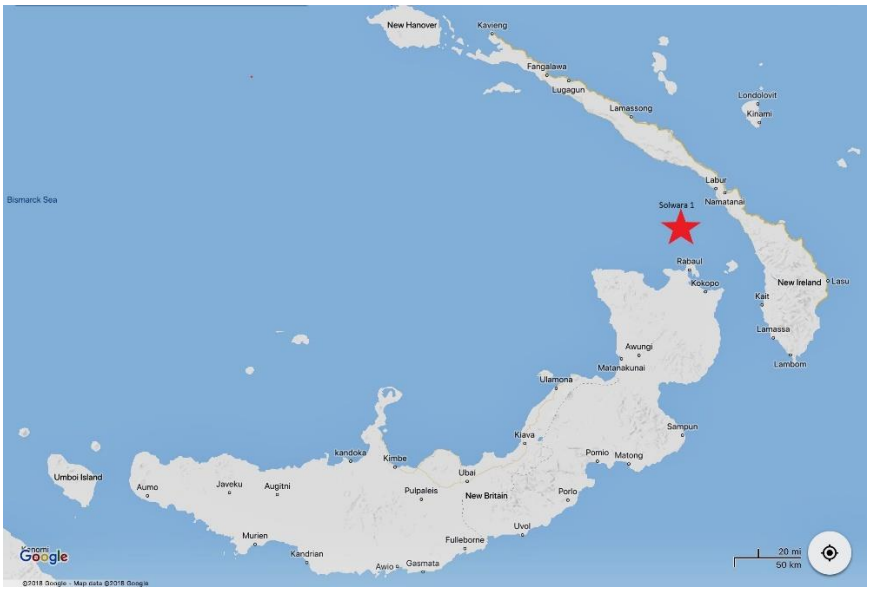

Figure 3b. Zoomed-in perspective of the Solwara I project between the provinces of New Britain to the south and New Ireland to the north, PNG.

The Environmental Impact Statement (EIS) for the Solwara I project asserts that an understanding of the impacts of mining hydrothermal vents is the “fundamental environmental issue for the project” (Coffey Natural Systems, 2008). However, the EIS acknowledges that the biodiversity associated with hydrothermal sites is largely unknown and that many species

that have yet to be identified will most probably become extinct as a result of the project (Coffey Natural Systems, 2008).

3.2.1 Technology

Nautilus Minerals is in the process of developing technology to mine SMS deposits associated with the volcanic arc beneath the Bismarck Sea (Filer and Gabriel, 2016). It is proposed that the mining operation will take place in two phases. Phase I will entail the extraction, stockpiling and export of the ore from Rabaul in East New Britain Province. Phase 2 will entail the construction of a treatment/concentrator facility (MPI, no date).

Rock material will be excavated and disaggregated from the seafloor by means of specialised seafloor production tools. Next, the material will be collected and pumped as seawater slurry to the production support vessel where the slurry is dewatered. The solid material will be moved to another vessel while the seawater is pumped back to the seafloor. The revised mine plan involves using an auxiliary cutter, a bulk cutter and a collecting machine (World Bank, 2017). The thinking behind the proposed method of mining is that it has the potential to extract SMS deposits with "surgical precision" and, given the small surface area of Solwara I, to minimise environmental impacts (Birney *et al.*, 2006; Nautilus Minerals, 2018c).

Given the pioneering nature of the project and the challenges of the deep offshore environment, costs are escalating rapidly as the project nears its launch. In this regard, Filer and Gabriel (2016) estimate that it is unlikely that revenue from the Solwara I project, once it becomes operational, will cover the costs of exploration and of developing the technology, which means that "this operation will only prove to be successful if the same technology is … applied to other resources of the same type".

3.2.2 The future

Nautilus Minerals holds 51 exploration licenses in the Bismarck–Solomons Seas in the southwest Pacific, covering an area of 107 917km^2, and 37 exploration licence applications, extending over another 88 906km in the Pacific (MPI, no date). Assuming the successful conclusion of the Solwara I project, Nautilus Minerals plans to undertake another eleven Solwara mining projects (2–12) in the Bismarck–Solomons Seas (World Bank, 2017).

Initially, the expectation was that Solwara I would be operational by 2010 (Coffey Natural Systems, 2008). However, over the course of the last decade, in addition to rising technical and financial risks, the project has run into various difficulties, including the 2008–2009

downturn in the commodities market (CMJ, 24 December 2008), stakeholder objections (Davidson and Doherty, 2017), an 18-month-long dispute with the PNG government over payment of its equity share in the project (Jamasmie, 2014), withdrawal of Anglo American (Lowrey, 2018a) and, most recently, the departure of the CEO, Mike Johnston (Creamer Media's Mining Weekly, 2018). At the time of writing, the project "is (now) expected to be delayed past Q3 2019" (Nautilus Minerals, 2018a).

3.3 The country

The motto of PNG is "Unity in Diversity" (OBG, 2015). While the diversity of the country is apparent, the term "unity" is perhaps more aspirational than descriptive.

PNG gained independence from Australia in 1975. The country comprises 600 islands, including the eastern part of the island of New Guinea and is divided into four regions and 22 provinces, including the National Capital District and the Autonomous region of Bougainville. The capital city is Port Moresby (Asian Development Bank (ADB), 2015; The Commonwealth, 2018).

3.3.1 Ring of fire

PNG, located in a volcanically and seismically active zone, the Pacific ring of fire, is the 12th most disaster-prone country in the world (OBG, 2015). Approximately 75% of the world's active volcanoes and 90% of earthquakes worldwide occur in the vicinity of this volcanic chain where the tectonic plates converge, causing volcanic eruptions, earthquakes and tsunamis (Globalsecurity.org, 2018a). On 25 August 2018, following a volcanic eruption, thousands of villagers were evacuated from Manam Island on the north coast of PNG (Owoseje, 2018). The hydrothermal vents producing the highly prospective mineralisation which is the target of the Solwara I project, are associated with active and dormant undersea volcanoes in the area.

Sometimes the geological turbulence of PNG is mirrored by social instability, such as when, in February 2018, after a powerful 7.5 earthquake struck the country, killing more than 150 people, the rescue effort by the UN had to be abandoned when violence broke out among residents of Hela Province, making the situation unsafe for rescue workers (Roy, 2018). Subsequently, a nine-month-long state of emergency was declared following prolonged violence and unrest (Berlinger, 2018).

3.3.2 Patchwork of cultures

PNG is the most linguistically diverse country in the world, with about 850 distinct languages spoken (The Economist, 2017). Curiously, eleven of these languages have no

known living speakers (South Pacific Internet Stats, 2015). Overall, languages are spoken by clans comprising a few dozen people to 650 000 speakers (The Economist, 2017; CIA, 2018).

The oldest group of languages are the Papuan group — introduced to PNG about 40 000 years ago (Country Watch, 2018). These languages are linguistically distinct and share no common root (The Economist, 2017). Then there are the Austronesian languages, which were introduced about 3 500 years ago, "probably from a single Taiwanese source" (The Economist, 2017). In the 1800s, German- and English-speaking colonists added their influence to the mix and, after independence, PNG adopted English, Tok Pisin and Hiri Motu as its official languages (ADB, 2015).

This astonishing diversity of languages has survived as a result of PNG's rugged topography with some communities, until recently, having been unaware of neighbouring clans "only a few kilometres away" (Country Watch, 2018). The population distribution of PNG is very uneven, with by far the majority of the population concentrated in rural, often inaccessible, areas and 13% living in urban areas (The Commonwealth, 2018).

3.3.3 Wantok

In the absence of linguistic cohesion nationally, the clan system establishes local clusters around the distribution of goods in a community. Clans are organised around individuals who are able to obtain and distribute wealth to the group. However, there is no "chief" or spokesperson for these clans, organised around the principle of "wantok" (meaning "one talk"). Wantok provides a safety net to the members of the clan, creating an expectation of benefit sharing (ADB, 2015). For example, people who work in cities will send money home by post to ensure that essential needs of the wantok members are provided for (OBG, 2015).

The pervasiveness of the wantok system is evidenced by its inclusion by the government in the PNG national strategy for responsible sustainable development (StaRS) as a means to provide social security, to reduce poverty and to achieve the development goals of the country (Department of National Planning and Monitoring (DNPM), 2014). Similarly, in its 2008 EIS, Nautilus Minerals acknowledges the system as one of three key elements underpinning the social environment of PNG, with the other two being the land tenure system and faith-based and community groups (Coffey Natural Systems, 2008).

In PNG, churches play a prominent role in civil society, providing an estimated 50% of health services, running two universities and managing about 40% of schools (ADB, 2015). Customary land ownership is the highest in the world, estimated at 97% (Birney *et al.*, 2006; OBG, 2015).

Although the wantok system is intended to function as a safety net within communities, it has the net effect of increasing the fragmentation of the social fabric of PNG and exacerbating tensions among the country's myriad of ethnic groups. Often these tensions lead to tribal fighting, crime and conflict (The National, 31 August 2018; Avalos *et al.*, 2015). Indeed, PNG is perceived to have among the highest rates of community violence in the world, with low rates of prosecution (Human Rights Watch (HRW), 2018).

When wantok is extended to national level, it often leads to nepotism, intensifying social tensions and inequality, "making cooperation in the national interest difficult" (Avalos *et al.*, 2015). As a result, tensions are worsened by perceptions of unequal wealth distribution, undemocratic resource governance and corruption (Banks, 2008). Clans look after their own, to the exclusion of others.

3.3.4 Revolving door politics

The influence of wantok appears to extend to the politics of PNG. Since independence in 1975, the outcomes of elections seem to have been determined on personal and ethnic considerations rather than party politics (Globalsecurity.org, 2018b). The country, ranking 75th out of 167 countries in the Democracy Index of the Economist Intelligence Unit (EIU) (2018) is indicated as a flawed democracy, scoring only 3.89 and 5.64 out of 10 for political culture and participation, respectively. These scores reflect weak governance and endemic corruption, with "cronyism" often taking precedence over efficiency (EIU, 2018). Since independence, PNG has been characterised by a "revolving door succession of prime ministers" (Country Watch, 2018), with Michael Somare's name appearing four times as prime minister. Julius Chan (the current New Ireland Governor) has been prime minister twice. Moreover, the sons of Chan and Somare have also held positions in parliament. The election process has been subject to vote rigging, violence and "ghost" voting — votes cast by people who were, in fact, deceased (Globalsecurity.org, 2018b). The present prime minister, Peter O'Neill, who has held office since 2011, was re-elected in 2017 amidst a "chaotic election campaign marred by violence" (SBS News, 2017). A warrant for his arrest on charges of having made corrupt payments to a law firm, was thrown out of court in December 2017. O'Neill had refused to be questioned and after the case was dismissed, he discharged the attorney general and deputy police commissioner. TI PNG compared O'Neill's conduct to "a disgruntled player sacking the referee and changing the rules" (Davidson, 2017a).

3.3.5 Development challenges

Despite its rich endowment in mineral resources, 40% of the population in PNG are living in poverty (HRW, 2018). The mineral resources of the country, including gold, copper and oil, accounted for almost two thirds of its export earnings of $9.5 billion in 2017 (CIA, 2018; Index Mundi, 2018) with very little of this revenue reaching the population. Poor governance and lack of transparency are well known factors leading to opaque policies and the ineffective distribution of resource revenues (Avalos *et al.*, 2015).

Currently, mining in PNG is regulated by the 1992 Mining Act, which is in the process of being revised in view of accommodating new developments in mining, notably in the offshore environment. The offshore mining policy, which has not yet been published, envisages regulating the distribution and sharing of benefits derived from offshore mining more effectively. According to the Secretary of the Department of Mineral Policy and Geohazards Management (DMPGM), Mr Shadrach Himata, the policy will be used when the Solwara I project becomes operational (The National, 15 October 2015).[6]

In this regard, PNG's ranking on the Corruption Perceptions Index, which provides a measure of public sector corruption, for 2017 is 135 (out of 180 countries), with the country having achieved a score of only 29/100 (TI, 2018).[7] In order to combat corruption, TI (2018) calls on governments to encourage free speech and open debate. Regulations on the media should be minimised and journalists should be allowed to do their work without fear of reprisal or violence. Access to information and the implementation of robust legal frameworks are regarded as key to reducing corruption and maximising transparency. Specifically, countries should harness the momentum created by the UN sustainable development goals (SDGs) to implement reforms nationally to ensure access to information and the protection of basic civil freedoms. Disclosure by governments of relevant data on open platforms will enhance accountability (TI, 2018).

Access to information in PNG is highly variable, with newspapers only available in towns. As a result of low literacy rates, people who can afford radios access the news that way, with television still being a luxury to many PNGeans (Firth, 2006). In 2006, only 1.6% of the

[6] The mining sector in PNG is regulated by the Mineral Resources Authority (MRA) and the DMPGM, with the former being responsible for issuing exploration licences and mining licences. The MRA is also tasked with the promotion of the sustainable development of the mining industry. The DMPGM, on the other hand, is responsible for policy and has been working on amending the 1992 Mining Act (MRA, no date).

[7] While PNG's score is very low, alarmingly, TI (2018). notes "that more than two thirds of countries score below 50".

population had cellphone access. In 2016, this figure had risen to 50% (Laryea, 2018) with Internet penetration in the country estimated at 11.7% (Statista, 2017)

Reporters without Borders (RSF) ranks PNG 53rd out of 180 countries in terms of press freedom. However, PNG has dropped two places in the rankings since 2017, with the current state of affairs being characterised as “fragile” (RSF, 2018). In a country wracked by violence, journalists’ lives are frequently endangered (Davidson, 2017b).

PNG was ranked 154 out of 185 countries in the Human Development Index (HDI) report for 2016, placing it in the “low human development” group (UN Development Programme (UNDP), 2017). Regionally, it had fared worse than other Pacific countries such as Fiji (91), Tonga (101) and Samoa (104) (Patjole, 2017b). The measures used to assess the country’s ranking in respect of three basic measures of human development, were longevity, access to information and standard of living. It was found that social and gender inequality and vulnerable communities had greatly impacted PNG’s rating. In fact it is estimated that gender inequality and the exclusion of women from the (formal) labour force had led to an estimated loss of income of 19% countrywide (Patjole, 2017b).

3.3.6 Sustainable development goals (SDGs)

The aspiration of the PNG government, as stated in its Vision 2050 is to create a “smart, wise, fair, healthy and happy society” and to achieve a ranking in the top 50 countries of the UN HDI by 2050 (Government of PNG, 2009). However, by 2015, PNG had not achieved any of the UN Millennium Development Goals (Trivedy, 2016).

In this regard, Roy Trivedi, the UN resident coordinator for PNG, has stressed the importance of building partnerships and harnessing innovation in order to achieve the country’s national development goals in future (Trivedy, 2016). Therefore, the UN, under the Prosperity Working Group, has launched various key projects in PNG, in order to explore ways of achieving the country’s SDGs as articulated in the country’s national StaRS. Essentially, the goal is to transform PNG into a middle income country by 2030 through the implementation of five-year medium-term plans (DNPM, 2014)

To this end, over the next five years (2018–2022), the Prosperity Working Group will undertake several key projects in PNG in view of improving the livelihoods of PNGeans. Disaster relief will be extended to those who have been affected by natural and man-made disasters and food gardens will be established (UNDP, 2018a). Digital solutions will be harnessed to establish local, regional and global connections. Safe market and city projects will be piloted and partnerships with training institutes built (UNDP, 2018a). In addition, training

will be extended to government officials to provide guidance and capacity building (UNDP, 2018b).

3.4 The coastal towns

Nautilus Minerals's 2008 EIS (Coffey Natural Systems, 2008) identifies Kavieng and Rabaul, in New Ireland and New Britain Provinces respectively, as the main local areas impacted by the project.

3.4.1 Coastal area of benefit

On their website, Nautilus Minerals (2018f) affirms that they will undertake, as the launch of operations draws near, to continue focussing stakeholder consultations on the Coastal Area of Benefit (CAB), defined as the "closest local-level government ward to the offshore mining lease together with the three adjacent wards in both directions along the coastline". The CAB is a concept defined, not by Nautilus Minerals, but by the DMPGM of PNG, in the yet to be released offshore mining policy of the country (Pacific Community–European Union (SPC-EU) workshop, no date). However, the CAB and the 2008 EIS definition of the impacted areas do not coincide. According to the definition of the Solwara I CAB, Rabaul (and New Britain) would be excluded from receiving benefits from the Solwara I project, as the CAB includes a maximum of seven wards — the original ward closest to operations (that of Kavieng) and three more on either side (Patjole, 2017a). This exclusion has created some dissatisfaction among the population of New Britain who claim to "feel cheated and lied to" (Rosenbaum, 2016). However, Nautilus Minerals has continued its stakeholder engagement in both New Ireland and New Britain Provinces, having signed MOUs with representatives of both provinces (The National, 7 August 2014).

3.4.2 New Ireland and East New Britain

New Ireland Province comprises a group of islands in northeast PNG and is home to a population of 194 000 people (Australian Doctors International, 2018). The capital city is Kavieng, which is the headquarters of the offshore component of the Solwara I project (Coffey Natural Systems, 2008). The island's population is largely rural, with 68% of the population relying on a subsistence lifestyle. Basic developmental challenges facing this province entail an almost complete lack of access to sanitation, running water and schools. Health care throughout the rural areas is provided by six doctors (Australian Doctors International, 2018).

After a volcanic eruption destroyed the harbour city of Rabaul in East New Britain in 1994, the capital city was moved to Kokopo (OBG, 2015). The population estimate for this province,

271 250, dates from 2011 (World Data Atlas, 2018). However, with high population growth rates throughout PNG, this figure may have changed significantly.

A survey of the CAB by Nautilus Minerals (2015) reports a total project affected population of only 8 146.

Once the Solwara I project is active, ore will be stockpiled in Rabaul before being shipped off for processing in China (Coffey Natural Systems, 2008). Given that Rabaul is situated on "alienated land" (i.e. customary land expropriated by the government), customary land ownership issues do not come into play (Coffey Natural Systems, 2008).

3.4.3 Social media

According to Roche and Bice (2013), perceptions of project risks and impacts are influenced by "prior experiences and knowledge of terrestrial mining operations". In PNG, in particular, many terrestrial mining operations such as Ok Tedi, Bougainville and Panguna have been characterised by "community disputes and legal wrangling" (Roche and Bice, 2013). Therefore, even though the impacts of DOM are still largely unknown, perceptions of future impacts based on past experiences may prove to be as important as "actual risks supported by scientific data" (Roche and Bice, 2013).

Social media play an important role in the context of the Solwara I project, giving a voice to affected stakeholders around these operations. In a country where significant linguistic fragmentation and geographical isolation present barriers to stakeholder engagement, social media may present a means of unifying the "stock of active connections" in the stakeholder network around Solwara I (cf. 2.6.3). Social media provide the protection of anonymity, allowing community activists to express their opinion without fear of reprisal. At the same time, however, without traceability and therefore, accountability, the key requirements around the SLO — legitimacy, credibility and trustworthiness are called into question.

3.4.4 Online stakeholder network

Various local and international activists, identifying themselves as stakeholders (and watchdogs) of the Solwara I project, have taken to social media to air their views.

Although their agendas and backgrounds differ, social media appear to unite these stakeholders in their opposition to seabed mining in general, and to the Solwara I project in particular. This dissertation will focus in particular on the following groups:

The Deep Sea Mining Campaign, an umbrella group for various national local and international activist groups and NGOs, declare themselves to be “concerned about the likely impacts of DSM on marine and coastal ecosystems and communities” (Deep Sea Mining Campaign, no date).

The Centre for Environmental Law and Community Rights Inc (Celcor) in Port Moresby, is currently representing community plaintiffs in a legal case against the government of PNG over the Solwara I project (Papua New Guinea Mine Watch (PNGMW), 15 December 2017).

The Solwara Warriors are unequivocal in their militant opposition of the Solwara I project and of further seabed mining in the Pacific. Photos on their Facebook page show an allegiance to the Deep Sea Mining Campaign, and various PNG activist groups.

The Papua New Guinea Mine Watch is a blog, with connections to the Ramu Nickel Mine (https://ramumine.wordpress.com). This anonymous blog, which was started in order to track the Ramu Nickel Mine in Madang Province of PNG, covers and reposts news relating to the whole mining sector in PNG. The Ramu Nickel Mine, which has been operational since 2012, has been highly controversial for its disposal of reactive tailings into the sea. Nevertheless, the mining company, Highland Pacific, in the face of clear evidence to the contrary, has maintained that no environmental damage has been caused (Asia–Pacific Journalism, 2012).

3.5 Conclusion

In this chapter, a description of specific aspects of the stakeholder network most closely involved with the Solwara I project in PNG was presented. In particular, an overview of the Solwara I project and the company, Nautilus Minerals, as well as the complex stakeholder network of the East New Britain and New Ireland Provinces was presented, followed by a discussion of the governance, economic and cultural impacts of the Solwara I project.

Chapter 4 will present an analysis of the role of the SLO in the context of the Solwara I project with a discussion of specific aspects of the social, environmental and economic impacts of Solwara I as these impact on the role of the SLO.

CHAPTER 4. ROLE OF THE SOCIAL LICENCE TO OPERATE IN THE CONTEXT OF SOLWARA I

4.1 Introduction

The Mineral Resources Authority (MRA) of PNG has hung an image of a hydrothermal vent chimney in the lobby of their offices (Blue Ocean Law and PANG, 2016). But does this gesture suggest that the prevailing level of the SLO in the Solwara I project has reached the pinnacle of psychological identification (Boutilier and Thomson, 2011), or does the escalating "rumbling of discontent" permeating news reports and social media (Filer and Gabriel, 2016) reflect that the SLO has, in fact, been lost? This chapter will present an analysis of the present role of the SLO in the context of Solwara I, together with a hypothesis of the anticipated role of the SLO for the future of the project and the future of DOM.

4.2 Free, prior and informed consent and the social licence to operate

The right of indigenous populations to FPIC is recognised by UNDRIP, adopted in 2007. Financial institutions, such as the World Bank, the ADB and the International Finance Corporation also endorse the principle, making adherence to FPIC a prerequisite to the provision of financing (World Bank, 2017). For example, before the proclamation of UNDRIP in 2007, the World Bank adopted, as a prerequisite to financing, the assessment of anticipated positive and adverse impacts of development projects proposed for financing. Borrowers are obliged to "consult" with indigenous peoples in view of obtaining "broad community support". (World Bank, 2017). While this perspective considers only how indigenous people are likely to be affected, FPIC requires going beyond consultation by adopting an "inclusive participatory approach" based on access to information and "the right to express their concerns" (World Bank, 2017).

4.2.1 Stakeholders affected by FPIC

In upholding the ability of indigenous people to authorise or veto development projects without coercion or intimidation (World Bank, 2017), FPIC is similar to the SLO in recognising indigenous people as stakeholders who are affected by and have the power to affect resource development projects. Indeed, Bice (2014) regards FPIC as an essential element of the SLO, although she remarks that FPIC is often overlooked. As with FPIC, the SLO is premised on stakeholder approval or dissent, rather than mere consultation. While the SLO plays a role throughout the course of a project, FPIC, in the strict sense of the concept, is applicable only before a project commences.

In terms of UNDRIP (2007), FPIC is a state obligation. However, in this regard, it should be borne in mind that the government of PNG has not yet ratified UNDRIP (PIANGO, 2016; Filer and Gabriel, 2016). Moreover, increasingly, companies are also being called upon to embrace FPIC as a fundamental component of "human rights due diligence that can help to create shared value for companies and communities and mitigate the risk of social conflict down the road" (Oxfam, 2018).

Given that there is no universal definition of "indigenous" other than a perception of cultural and spiritual ties to the land (World Bank, 2017), the International Council on Mining & Metals (ICMM) (2013) recommends extending the concept of FPIC to non-indigenous people. Thus, the concept of FPIC is increasingly seen to apply to all stakeholders of mining operations, including DOM (Hunter *et al*., 2018).

Companies are not obliged to obtain unanimous approval from communities and are not required to consent to aspects beyond their control (ICMM, 2013). The ICMM (2013) recommends that companies and indigenous stakeholders decide on reasonable dispute resolution mechanisms at the outset. In the event of a dispute, if attempts at mediation fail, the ICMM (2013) recommends that the government assume the ultimate responsibility for determining whether a project should proceed.

4.3 The lawsuit

The Guardian (Davidson and Doherty, 2017) reports that, in December 2017, community groups affected by Solwara I, led by Celcor, instituted a lawsuit against the government of PNG. Disgruntled stakeholders claim that key documents, "including the original permit, the environmental management plan and independent reviews, oceanographic data on the site and … modelling of the environmental, social, health, culture and economic impacts" have been withheld from them (Davidson and Doherty, 2017). Although demands for "increased transparency" regarding Solwara I were sent to the PNG government as early as 2012, these have fallen on deaf ears (Lowrey, 2017). Concerns over the government's stake in Solwara I and questions over environmental impacts and the financial viability of the project have also entered the fray.

The lawsuit, instituted against the government of PNG, appears to conflate government and company roles. Solwara I is said to be at the "centre of the court hearing" and while the stated purpose of the lawsuit is to halt the project (Lowrey, 2018b; Hosie, 2017), the suit is directed at the government of PNG primarily, and at Nautilus Minerals, indirectly. Jonathan Mesulam, spokesperson for the Alliance of Solwara Warriors (PNGMW, 28 February 2018),

takes issue with Nautilus Minerals's approach to stakeholder engagement because the "community at large (has not given) 'free, prior and informed consent' on the company's permit" (Davidson and Doherty, 2017). At the same time, however, he goes on to say that the community "had no control (because the permit) has been organised by the former minister, and a few other people from the local level government" (Davidson and Doherty, 2017). It would therefore appear that the lawsuit is as much about the government having failed the people as it is about Solwara I:

> *Our history has shown us over 40 years that despite active government engagement in extractive (mining) industries and despite seeing and witnessing billions of kina in revenue earned by foreign companies, there really is nothing to show in terms of real development and benefit to the citizens and the nation* (PNGMW, 9 February 2018).

4.4 Transparency and the SLO

Prno and Scott Slocombe (2012) emphasise the importance of ongoing stakeholder engagement, transparency and "open communication" to earning and maintaining an SLO. Roche and Bice (2013) reiterate the importance of transparency, adding to this a "genuine commitment to corporate social responsibility".

In this regard, Nautilus Minerals (2018i) lists among its stakeholder engagement goals an undertaking to ensure that stakeholders are "properly informed", the provision of a structure for stakeholder inputs and the consideration of "valid concerns and interests" with the incorporation of these concerns into "mitigation plans, if practicable". The EIS of the company undertakes to establish a grievance procedure so that community concerns may be dealt with "in a culturally appropriate and expeditious manner" (Coffey Natural Systems, 2008). Moreover, in order to make its EIS more accessible, the executive summary of the report has been published on the company website in Tok Pisin (Nautilus Minerals, 2018e).

From independent assessments of Nautilus Minerals's performance regarding its stakeholder engagement and commitment to transparency, the company's performance appears to be exemplary. The World Bank (2017) underwrites the company's "strong history of transparency and data sharing". The Business & Human Rights Resource Centre (BHRC) (2018), lists reports and articles relating to the activities of various businesses, including Nautilus Minerals. Each company whose activities are reported on in the media, is given the opportunity to respond, with company responses published on the website. Nautilus Minerals's response rate is given as 100% (BHRC, 2018). For example, the thread containing the above

article from The Guardian (Davidson and Doherty, 2017), includes an (earlier) a report by Nautilus Minerals (2016) clarifying how its exploration and mining licences were obtained and where the records pertaining to these may be found.

Over the last decade, Nautilus Minerals (2018i) has held extensive community meetings with over 20 000 PNGeans in 46 locations "to ensure the views and concerns of local communities (are) heard". Despite these efforts, however, the PNGMW (17 July 2018) reports that the Solwara Warriors "are now well informed of the potential impact" of the project and that they are "giving their undivided support to ensure that the project is stopped at all cost". The (then) CEO of Nautilus Minerals counters this argument by claiming "broad and strong public (and government) support" saying that the project opponents represent a minority view (Davidson and Doherty, 2017). However, despite the best efforts of Nautilus Minerals to facilitate public access to information, access to these data in PNG is severely hampered by the low Internet penetration in the country.[8] In addition, despite Nautilus Minerals's commitment to transparency, stakeholder opposition to the project seems to be increasing, especially on social media (Roche and Bice, 2013).

As the present lawsuit demonstrates, public perception appears to conflate government and company roles. Stakeholder concerns regarding government transparency may not be entirely unjustified. The National (10 August 2015) reports an admission by New Ireland Governor, Julius Chan, that "the Government unilaterally granted a mining lease to Nautilus Minerals in January 2011 without the people's consent". Curiously, Chan goes on to claim that "unless we are autonomous, the project will therefore go ahead. We have no choice but to accept that".

Nevertheless, opposition to Solwara I, while vocal, may not be as "undivided" as suggested by Mesulam, with New Ireland elders yet to speak out unequivocally against the project, appearing to support a precautionary approach. Their appeal to the government of PNG is to ensure that the offshore policy and mining legislation are updated before DOM activities are undertaken (Loop PNG, 2018).[9] Julius Chan seems to be wavering between "neutral" (PNGMW, 27 April 2017) and "opposed" (PNGMW, 26 December 2017).

4.5 Impacts and benefits

According to Black (2013), the first step to earning an SLO is ensuring that the benefits of a mining operation outweigh the costs/impacts. In terrestrial operations, the costs are

[8] Cf. 3.3.5.
[9] The national PNG Council of Churches is supporting a ban on seabed mining (PNGMW, 5 September 2018).

immediate and proximal, with benefits often only accruing long term (Boutilier *et al*., 2012). In the case of Solwara I (and future DOM operations), however, onshore impacts appear to be greatly reduced (Roche and Bice, 2013). Indeed, an independent report by Earth Economics (2015) on the impacts of Solwara I predicts that "the site will have virtually no impact on human communities". The World Bank (2017) largely corroborates this finding but qualifies that it should be "considered with some caution" as the environmental and social costs of DSM (and DOM) are still largely unknown. Moreover, one of the criticisms of the report by Earth Economics is that impacts are discussed for Solwara I only without taking into account that a number of future Solwara projects are being planned, greatly increasing the impacts and time period of mining operations (Rosenbaum and Grey, 2015).

4.5.1 Impacts

Roche and Bice (2013) emphasise the importance of addressing perceptions in managing the anticipated impacts of DOM. Often these perceptions are seen to inform responses to operations, frequently disregarding scientific evidence diametrically opposed to those notions.

Subsistence fishing is an important activity in New Ireland Province. Although the Earth Economics (2015) report claims that coastal fisheries will not be impacted by Solwara I, given the distance of the mine from the coast, there is nevertheless a perception among some villagers that there has been an increase in dead fish and a pervasive foul smell attributable to the exploration activities at Solwara I (Mou, 2016). In addition to these observations, sightings of "unusual deep sea creatures hot to the touch" have been reported (Blue Ocean Law and PANG, 2016).

It is very difficult to establish a causal link between the Solwara I project and the above observations. PNG has a long history of unsustainable mining practices where tailings are known to have been dumped into the sea. Therefore, these practices are more likely responsible for the reported phenomena than Solwara I. For example, an assessment of the impacts of 15 years of dumping tailings from the Lihir mine in New Ireland into the sea, established a direct link between this practice and the significant depletion of marine in-sediment fauna and other structures (Hughes *et al.*, 2015).

In a survey by the UN, 90% of respondents in New Ireland Province said that their livelihoods were being impacted by climate change (Laryea, 2018). Indeed, the effects of climate change in PNG have been significant. Many PNGeans from the Carterer islands have become the world's first displaced population as a result of rising sea levels. As sea levels

continue to rise, it is expected that more islands in PNG will soon become uninhabitable (Minority Rights Group International, 2011).

Climate change predates Solwara I and is one of the global “messes” for which no one industry can be held accountable (Boutilier, 2009). For example, it is estimated that unsustainable logging practices will cause the PNG to have lost 53% of its total forested areas by 2021 (Minority Rights Group International, 2011). However, based on an article in the Harvard Environmental Law Review highlighting the “potentially critical contributions” of hydrothermal vents to climate regulation (Hunter *et al*., 2018), the PNGMW (21 April 2018) draws a direct correlation between Solwara I and climate change. In his independent critique of the Nautilus Minerals’s EIS, Steiner (2009) affirms the existence of a “strong spiritual connection” between PNG people and “hydrothermal vents systems that they have never seen”. He continues to assert that the PNGeans “feel” “substantial stewardship” for the sea and that they attach “considerable spiritual value” to it. Although the coastal communities do not live near the Solwara I site, their “ownership and tenure” over the site should be recognised (Steiner, 2009).

In this regard, the yet to be published new PNG offshore mining policy asserts that the mineral resources of the seabed will be governed as the “common heritage of the nation” (SPC-EU workshop, no date). How this principle will be played out in future will very much depend on the strength of governance around offshore mining.

Although 97% of the PNG population nominally identify as Christian (CIA, 2018), strong ties with ancient ethnic, predominantly animistic mythologies are retained. In this regard, Solwara I is seen by some to thwart people’s passage into the afterlife because of its location. Noise interference from the project has also been seen to impact on the cultural practice of shark calling and concerns have been voiced over the disturbance caused to “deep sea animals” and spirits (Blue Ocean Law and PANG, 2016). Interestingly, Jorgensen (2014) remarks that narratives invoking spirituality and customary heritage around mining operations in PNG are often specifically shaped to “establish land claims and secure benefits”. Whether these mythologies are sufficiently widespread to gain traction in the case of Solwara I remains to be seen.

4.5.2 Benefits

Nautilus Minerals established its CSR division, Nautilus Cares, in order to respond to the needs of stakeholders affected by the Solwara I project. In order to determine priorities in terms of community development, the company voluntarily conducted a needs assessment of

over 1 500 households in the CAB, and appointed members of the community to assist with the survey (Nautilus Minerals, 2015). In the most recent annual report (2015) posted on the company's website, Nautilus Minerals emphasises the importance of having maintained an SLO through the leadership of its CSR team. Various initiatives, including a health baseline study, a partnership against malaria, and a water and sanitation programme are aligned with the SDGs of the country. In particular, the programmes target primary schools in providing water and sanitation facilities and education. The goal is for the communities to become self-sufficient in running these initiatives themselves (Nautilus Minerals, 2015). Moreover, the company is actively involved in the promotion of science in the schools of the CAB. Nautilus Minerals completed the construction of a bridge in partnership with the Provincial Government and Works Department of New Ireland Province. The bridge, providing an important gateway to health and education services and to markets, was handed over early in 2017 (Pacific Islands Report, 2017). However, in terms of the SLO, perceptions regarding benefits provided are at least as important as the benefits themselves.

In the original EIS issued by the company (Coffey Natural Systems, 2008), Nautilus Minerals undertakes to provide training and employment opportunities and to involve local businesses in the procurement of goods and services. In addition to legislated royalties and taxes paid to government and the voluntary amount 2 kina per tonne of mineralised ore mined paid into a community development fund (Nautilus Minerals, 2018b), the company also undertakes to develop human and financial capital in the country and to improve the balance of trade, infrastructure and employment and educational opportunities (Coffey Natural Systems, 2008).

As the project launch date approaches, it is becoming increasingly apparent that Solwara I is probably not going deliver on its perceived potential in terms of jobs and training. It is estimated that Solwara I will provide employment to only about 200 people and that local procurement opportunities, likewise, will be limited (PNGMW, 3 October 2017) with operations taking place offshore and the recovered minerals being processed in China (Nautilus Minerals Niugini Ltd, 2018). Increasingly, affected stakeholders are questioning whether they are receiving their "fair share of benefits" (Nelsen, 2006) and whether therefore, Nautilus Minerals is deserving of an SLO.

Since 2016, Nautilus Minerals has been decreasing its spend on CSR (as well as on administration and exploration), as a result of rising equipment manufacturing costs, financial and technical difficulties and mounting stakeholder (and shareholder) pressures (Nautilus Minerals, 2018d).

4.6 Social capital

Black (2013) regards legitimate benefits and building “strong social capital within communities” and “playing your part in the broader social contract” as foundational to the SLO. In this regard, social capital is the “glue” of the SLO. This view of the SLO is reminiscent of Thomson and Boutilier's (2017b) requirement of compliance “with any and all commitments made to the community”. Thus, the SLO is founded on a relationship among stakeholders within a network. One stakeholder’s commitment to promise keeping, trustworthiness and transparency (Black, 2018) of itself does not establish an SLO – the SLO is necessarily premised on reciprocity and establishing connections/networking (cf. Figure 3).

4.6.1 Broken promises and good intentions

In 2014, a year-long dispute between the government of PNG and Nautilus Minerals was settled in the company’s favour. The court ordered the government, which had been holding back on payment of its 15% equity share in Solwara I to settle its debt and the matter was resolved (Samson, 2014). The legal dispute took more than a year to resolve, setting back the project significantly and leading to a precipitous drop in the company’s share price, from an all-time high of 3.48CAD (29 January 2011) to a low of 0.235CAD (23 April 2014) (TMX, 2018) — Figure 4.

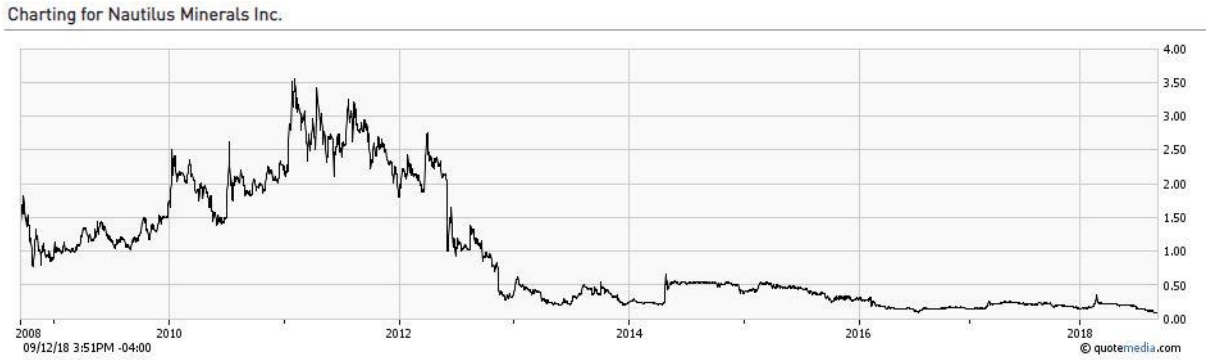

Figure 4. Share price of Nautilus Minerals over the last decade (TMX, 2018).

As is evident from Figure 4, Nautilus Minerals has not yet recovered from this dispute. Not only had the PNG government attempted to renege on its commitment to Nautilus Minerals, but it also let the people of PNG down by placing public funds in the “riskiest of all mining ventures” (World Bank, 2017). Moreover, attempting to play the role of shareholder and regulator simultaneously compromises the integrity of the government as regulator. In this regard, the World Bank (2017) cautions that the responsible management of DOM mining will depend on technical expertise and a sound regulatory regime.

The government borrowed USD120 million from Bank South Pacific to pay for its stake in the Solwara I mine. Payment for the 15% stake amounted to USD113 million, but this has left USD 7 million unaccounted for (PNGMW, 22 February 2018).

Recently, the PNG government has shown a commitment to strengthening governance structures and greater transparency. The 1992 Mining Law is in the process of being updated with an offshore mining policy to be published imminently. However, until the amended legislation has been published, speculation and concerns are fuelled by uncertainty, which is a disincentive to investment and the establishment of a SLO.

In 2014, PNG was admitted as a candidate country of the EITI, with validation having started in April 2018 (EITI Secretariat, 2018). In order to strengthen governance around its extractive industry, the World Bank (2017) recommends that PNG work towards compliance with the EITI. The PNG government has also committed to the establishment of a sovereign wealth fund. The intention is to invest taxes and royalties from major extractive projects. In the meantime, it is estimated that it will take at least another year "if not two" for the fund to be established – curiously, the "revenue is available, but it can't flow into the fund until the fund's been set up" (James, 2018).

4.7 Where is the SLO?

2018 has been a torrid year for Nautilus Minerals, with the exit of its PNG Chief of Operations and its Chief Executive Officer in quick succession. In addition, Anglo American has chosen to divest from the project[10] and Nautilus Minerals's share price has reached an all-time low of 0.080CAD as at 23 September (TMX, 2018).

However, the Solwara I project is still in the preproduction phase and is not expected to be profitable at this stage. If Nautilus Minerals is able to weather the storm and continue obtaining financing to cover preproduction costs, and if the project goes into production, it has the potential to be very lucrative. It is estimated that the government of PNG stands to earn a net revenue between USD75 million to USD260 million from Solwara I (Wakefield and Myers, 2018). It may be the promise of this windfall revenue that accounts for the image of the hydrothermal vent chimney in the MRA offices rather than considerations of co-identification with Solwara I.

[10] Although the Deep Sea Mining Campaign would like to claim the exit of Anglo American as a sign that the company has heeded its warning about the unsustainability of Solwara I, Anglo also divested from another PNG project earlier this year and its exit from the Solwara I project may merely be a business decision (Lowrey, 2018a).

Building trust and restoring confidence in the highly fragmented and capricious stakeholder network around Solwara I is proving to be an onerous challenge. Moreover, as the current lawsuit illustrates, the extent to which Nautilus Minerals can be said to have an SLO is intricately connected to stakeholder perceptions of the PNG government.

Thomson and Boutilier (2017a) propose a range of indicators to measure the state of the SLO (Figure 5).

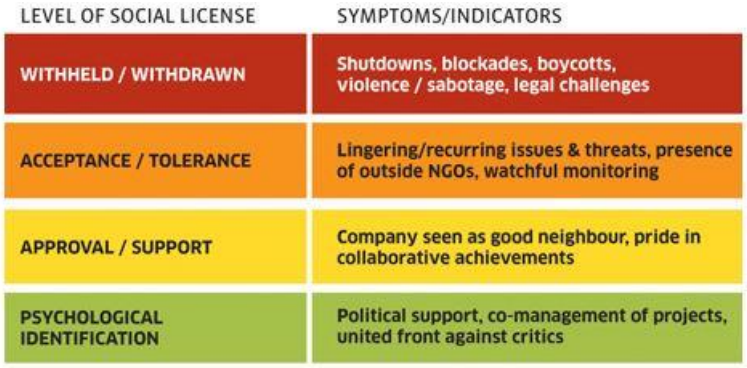

Figure 5. Physical indicators of the SLO (Thomson and Boutilier, 2017a).

Based on the indicators in Figure 5, it would appear that the ongoing litigation around Solwara I, although directed at the PNG government, means that Nautilus Minerals currently does not have an SLO. However, the company's ongoing efforts to remain afloat and to ensure that Solwara I starts as soon as possible probably mean that the SLO is not playing that important a role in the project at the moment. At any rate, if the project goes ahead, the SLO is not likely to be a determining factor. Likewise, if the project does not proceed, this will probably be due to financial or technical factors rather than the SLO.

Earning an SLO is "neither a short term nor a linear achievement" (Boutilier *et al*., 2012). These authors propose that a five-year perspective offers a more realistic perspective. Therefore, Nautilus Minerals has probably hovered around the "acceptance" level of the SLO over the last few years (Figure 5) through its consistent stakeholder engagement and efforts to provide information and answer questions.

In this time, however, overall, the SLO has not transcended the credibility boundary to reach "approval" (Figure 1). Although MOUs were signed with East New Britain and New Ireland Provinces, these cannot necessarily be equated with an SLO. Moreover, although Nautilus Minerals appears to have honoured commitments and provided clear information, this information, having been published online, has not always been readily accessible. The company has not offered ways for the people of PNG to participate in and therefore to co-own

the project. Also, Nautilus Minerals has been let down by the PNG government, who in the mind of the public is inextricably linked to the Solwara I project, and has therefore lost credibility in the minds of the public.

4.8 Future of DOM

At this point it is not clear whether Solwara I will go ahead in the near future. However, it appears that the SLO is not a determining factor in this project. This may be as a result of the very short-term nature and limited physical extent of the project. However, future DOM life cycles are likely to be much longer term, with the SLO predicted to play an “essential” role in ensuring the equitable distribution of benefits (Roche and Bice, 2013; World Bank, 2017). It is anticipated that the future mine-affected communities will likely manifest as a worldwide network of stakeholders. Thus, earning and maintaining an SLO in the emerging industry of DOM will most likely entail establishing interdependent networks of stakeholders globally in order to collaboratively find the best solutions towards sustainable outcomes (Owen and Kemp, 2013).

Traditionally, the SLO has been regarded as a concept specific to a particular project (Thomson and Boutilier, 2017b). The question of whether it is possible to assign an “international” industry-wide SLO will therefore entail aligning the future well-being of the DOM/DSM industry with the “successes of the civil and public sectors” (Boutilier, 2009).

4.9 Conclusion

This chapter presented an overview of the role of the SLO within the complex stakeholder network of the Solwara I project. It was shown that the SLO is influenced both by perceptions of legitimacy and of perceptions of coalitions. In the case of Solwara I, over the last five years, the SLO has hovered around the acceptance level, never transcending the credibility boundary for very long. At the present time, however, it appears that Nautilus Minerals does not have an SLO. The project, besieged by numerous challenges, of which the SLO is but one, seems to be forging ahead regardless. The successful launch of Solwara I, given its limited scale and time frame, will probably be contingent on factors unrelated to the SLO. Given that future DOM operations are likely to be longer term and more global in scale, the SLO is likely to play a determining role.

CHAPTER 5. CONCLUSION

There has been a growing recognition by mining companies of the need to align their operations with the tenets of sustainable development (Boutilier, 2009; Bice, 2014). It is within this context that that there is an acknowledgement of the importance to obtain, in addition to the legal licence to mine, an SLO from the community affected by these operations (Prno and Scott Slocombe, 2012). This dissertation has investigated the potential role of the SLO in the context of the emerging industry of DOM.

The chosen case study is the Solwara I project in the EEZ of PNG. In 2011, the PNG government awarded the first commercial-scale DOM licence to Nautilus Minerals, a Canadian company. Findings from this project were extrapolated to the emerging industry of DOM.

The theory of the SLO was presented with a discussion on how the concept might apply to DOM. The SLO, denoting an informal measure of the approval of an affected local community in respect of a mining operation, was juxtaposed with the formal legal licence. In the context of DOM, the SLO, although still serving as the basis for a dialogue between mining companies and affected communities, has undergone a shift, now potentially applying to a much larger more diffuse, audience. Affected communities are no longer “local” or proximal to operations. In this regard it is more appropriate to speak of stakeholders rather than local communities. Stakeholders are both affected by and have the ability to affect mining operations. Moreover, they are not necessarily defined in terms of their location. It was shown that the establishment of active connections based on trust and transparency is essential to earning and maintaining an SLO in the context of DOM. Stakeholders must view benefits accruing from mining operations as legitimate.

Specific aspects of the stakeholder network around Solwara I were presented. It was found that the configuration of stakeholders around the project is highly fragmented and volatile. Socio-political connections are largely based on the wantok system, which creates close bonding locally but which hampers networking beyond the clan system. Moreover, the manifestation of wantok on a national scale has contributed to corruption, poor governance and a lack of transparency. The net effect has been an ineffective distribution of resource revenues, the persistence of widespread poverty, and a challenging context in regard to the SLO.

Although PNG failed to achieve any of the millennium development goals, various initiatives are currently underway under the auspices of the UN in support of the national development plan of the government. Moreover, the Mining Act is being revised and an offshore mining policy, the purpose of which is to regulate DOM, is due to be released soon.

It is against this background that an overview of the stakeholders of the two island provinces closest to Solwara I was presented. While the project is positioned to make a significant contribution to the SDGs of PNG, linguistic fragmentation and geographical isolation present significant barriers to stakeholder engagement. The Internet and social media may present a means of building the social capital necessary to establishing a stakeholder network which is able to earn and issue an SLO.

In assessing the role of the SLO in the context of the Solwara I project, it was noted that perceptions of impacts and benefits are at least as important as the reality. In this regard, past experiences are also important in informing perceptions and the likelihood that an SLO will be issued.

The present litigation in which the government of PNG is being taken to court by the community, illustrates that the stakeholders are conflating government actions and the operations of Nautilus Minerals. Therefore it would seem that the company does not currently have an SLO, as the purpose of the court case is to stop Solwara I. However, the apparent absence of an SLO does not seem to be the deciding factor in determining whether the project will proceed. The legal mining licence remains in force, and despite enormous financial pressures, Nautilus Minerals is forging ahead with plans to start mining in 2019 or 2020. The future of the project appears to depend on the availability of financing and the ability to overcome technical challenges rather than the SLO.

Taking a longer-term view of the project, it appears that the SLO has hovered around the acceptance level of the SLO. Despite the company's commitment to transparency and efforts to build a relationship with stakeholders over the last decade, the SLO has never transcended the credibility boundary for very long. Although Nautilus Minerals appears to have honoured commitments and provided clear information, this information has not always been readily accessible. The company has not really offered ways for the people of PNG to participate in and therefore to co-own the project. Also, Nautilus Minerals has been let down by the PNG government, significantly delaying operations, impacting its share price and damaging trust among stakeholders.

Overall, it appears that the SLO alone is not the determining factor in the Solwara I project. This may be as a result of the very short-term nature and limited physical extent of the operation. However, future DOM life cycles are likely to be much longer term, with the SLO predicted to play an "essential" role in ensuring the equitable distribution of benefits. Thus, earning and maintaining an SLO in the emerging industry of DOM will most likely entail establishing interdependent networks of stakeholders globally in order to collaboratively find the best solutions towards sustainable outcomes. Given that future DOM operations are likely to be longer term and more global in scale, the SLO is likely to play a key role.

BIBLIOGRAPHY

Journal articles

Avalos, N., Stuva, V.G., Heal, A., Lida, K. and Okazoe, N. (2015) Papua New Guinea and the natural resource curse. Comparative Economic Studies, 57(2), pp.345–360.

Bice, S. (2014) What Gives You a Social Licence? An Exploration of the Social Licence to Operate in the Australian Mining Industry. Resources, 3(1), pp. 62–80. doi: 0.3390/resources3010062.

Boutilier, R.G. (2014) Frequently asked questions about the social licence to operate. Impact Assessment and Project Appraisal, 32(4), pp. 263–272. doi: 10.1080/14615517.2014.941141.

Boutilier, R.G. and Thomson, I., 2011. Modelling and measuring the social license to operate: fruits of a dialogue between theory and practice. Social Licence, pp.1779-96.

Boutilier, R.G. and Zdziarski, M. (2017) Managing stakeholder networks for a social license to build, Construction Management and Economics. Routledge, 35(8–9), pp. 498–513. doi: 10.1080/01446193.2017.1289229.

Boutilier, R.G., Black, L.D. and Thomson, I. (2012) From Metaphor to Management Tool — How the Social License to Operate can Stabilise the Socio-Political Environment for Business. International Mine Management 2012 Proceedings, 227-237. Melbourne, Australian Institute of Mining and Metallurgy. Available at: http://www.stakeholder360.com/Boutilier_Black_Thomson_From_metaphor_to_mgmt_tool_w_AUSIMM_permission.pdf [Accessed on 16 September 2018].

Bursey, D. and Whiting, V. (2015) Rethinking Social Licence to Operate: A Concept in Search of Definition and Boundaries. Environment and Energy Bulletin, Business Council of British Columbia, 7(2), pp. 1–10.

Cohen, D. and Prusak, L.(2002) In good company: how social capital makes organizations work. Harvard Business School Press, Boston, Massachussetts.

Cooney, J. (2017) Reflections on the 20th anniversary of the term “social licence”, Journal of Energy & Natural Resources Law. doi: DOI: 10.1080/02646811.2016.1269472.

Filer, C. and Gabriel, J. (2016) How could nautilus minerals get a social licence to operate the world’s first deep sea mine? Marine Policy. Elsevier (December). doi: 10.1016/j.marpol.2016.12.001

Firth, S. (2006) Globalisation and Governance in The Pacific Islands, The Contemporary Pacific, 20, pp. 121–135. doi: 10.1353/cp.0.0015.

Hughes, D.J., Shimmield, T.M., Black, K.D. and Howe, J.A. (2015) Ecological impacts of large-scale disposal of mining waste in the deep sea. Scientific reports, 5, p. 9985.

Hunter, J., Singh, P. and Aguon, J. (2018) Broadening Common Heritage: Addressing Gaps in the Deep Sea Mining Regulatory Regime. Harvard Environmental Law Review (16 April). Available at: http://harvardelr.com/2018/04/16/broadening-common-heritage [Accessed on 16 September 2018].

Jorgensen, D. (2014) Mining narratives and multiple geographies in Papua New Guinea: Ok Tedi, the emerald cave and Lost Tribes, Journal de la société des océanistes. Société des Océanistes, pp. 23–36. doi: 10.4000/jso.7117.

Lacey, J., Parsons, R. and Moffat, K. (2012) Exploring the concept of a Social Licence to Operate in the Australian minerals industry: results from interviews with industry representatives. EP125553, CSIRO, October.

Moffat, K. and Zhang, A. (2014) The paths to social licence to operate: An integrative model explaining community acceptance of mining, Resources Policy. Pergamon, 39, pp. 61–70. doi: 10.1016/J.RESOURPOL.2013.11.003.

Nelsen, J.L. (2006) Social licence to operate: industry survey, Mining, Reclamation and Environment, 20(3), pp. 161–162. doi: 10.1080/17480930600804182.

Owen, J.R. and Kemp, D. (2013) Social licence and mining: A critical perspective, Resources Policy. Elsevier, 38(1), pp. 29–35. doi: 10.1016/j.resourpol.2012.06.016.

Prno, J. and Scott Slocombe, D. (2012) Exploring the origins of “social license to operate” in the mining sector: Perspectives from governance and sustainability theories, Resources Policy. Elsevier, 37(3), pp. 346–357. doi: 10.1016/j.resourpol.2012.04.002.

Wakefield, J. and Myers, K. (2018) Social cost benefit analysis for deep sea minerals mining, Marine Policy, 95, pp. 346–355.

Yeats, C. (2012) Deep sea mining: exploration is inevitable, Sci Dev Net. Available at: https://www.scidev.net/global/earth-science/opinion/deep-sea-mining-exploration-is-inevitable.html [Accessed on 16 September 2018].

Reports

Asian Development Bank (2015) Civil society briefs — Papua New Guinea. Available at: https://www.adb.org/sites/default/files/publication/173264/csb-papua-new-guinea.pdf [Accessed on 16 September 2018].

Banks, G. (2008) Understanding resouce conflicts in Papua New Guinea, Asia Pacific Viewpoint, 49(1), pp. 23–34.

Black, L. (2013) Your Social Licence to Operate: When Communities become Advocates, CSR Wire. Available at: http://www.csrwire.com/blog/posts/1085-your-social-licence-to-operate-when-communities-become-advocates [Accessed on 16 September 2018].

Blue Ocean Law and Pacific Network on Globalisation (2016) Resource Roulette: How Deep Sea Mining and Inadequate Regulatory Frameworks Imperil the Pacific and its Peoples. Available at: https://cer.org.za/wp-content/uploads/2016/08/Resource-Roulette-Deep-sea-Mining-and-Inadequate-Regulatory-Frameworks.pdf [Accessed on 16 September 2018].

Coffey Natural Systems (2008) Environmental Impact Statement. Solwara 1 Project.Nautilus Minerals Niugini Limited, Main Report Coffey Natural Systems, Brisbane.

Country Watch (2018) 2018 Country Review — Papua New Guinea. Available at: http://www.countrywatch.com/Content/pdfs/reviews/B3ZM9Q86.01c.pdf [Accessed on 16 September 2018].

Cuyvers, L., Berry, W., Gyerde, K., Thiele, T. and Wilhem, C. (2018) Deep seabed mining A rising environmental challenge. Available at: https://portals.iucn.org/library/sites/library/files/documents/2018-029-En.pdf [Accessed on 16 September 2018].

Deloitte (2011) Stakeholder engagement. Available at: https://www2.deloitte.com/content/dam/Deloitte/za/Documents/governance-risk-compliance/ZA_StakeholderEngagement_04042014.pdf [Accessed on 16 September 2018].

Department of National Planning and Monitoring (2014) National Strategy for Responsible Sustainable Development for Papua New Guinea. Available at: http://www.planning.gov.pg/images/dnpm/pdf/StaRS.pdf [Accessed on 16 September 2018].

Earth Economics (2015) The Environmental and Social Benchmarking Analysis of the Nautilus Minerals Inc. Solwara I Project. Available at: http://www.nautilusminerals.com/irm/content/earth-economics-report2.aspx?RID=438 [Accessed on 16 September 2018].

EY (2018) Top 10 business risks facing mining and metals 2017–2018. Available at: https://www.ey.com/Publication/vwLUAssets/ey-top-10-business-risks-facing-mining-and-metals-2017-2018/$FILE/ey-top-10-business-risks-facing-mining-and-metals-2017-2018.pdf [Accessed on 16 September 2018].

Government of Papua New Guinea (2009) Papua New Guinea. Vision 2050. Available at: http://actnowpng.org/sites/default/files/png version 2050.pdf [Accessed on 16 September 2018].

Human Rights Watch (2018) World Report 2018: Papua New Guinea. Available at: https://www.hrw.org/world-report/2018/country-chapters/papua-new-guinea [Accessed on 16 September 2018].

International Council on Mining & Metals (2013) Indigenous Peoples and Mining. Position Statement, May 2013. Available at: https://commdev.org/wp-content/uploads/2015/06/ICMM-Indigenous-Peoples-and-Mining-Position-Statement.pdf [Accessed on 16 September 2018].

Laryea, S. (2018) What 8000 Papua New Guineans have to say about sustainable development, Tales of delivering sustainable development together. Available at: https://undg.org/silofighters_blog/what-8000-papua-new-guineans-have-to-say-about-sustainable-development [Accessed on 16 September 2018].

Mining Association of Canada (2018) Towards Sustainable Mining. Available at: http://mining.ca/towards-sustainable-mining [Accessed on 16 September 2018].

Mining Technology (2018) Solwara project. Available at: https://www.mining-technology.com/projects/solwara-project [Accessed on 16 September 2018].

Minority Rights Group International (2011) State of the World's Minorities and Indigenous Peoples 2011. Events of 2010. Available at: http://www.crin.org/en/docs/MRG SWM 2011-FULL TEXT.pdf [Accessed on 16 September 2018].

Natural Resource Governance Institute (2015) The Resource Curse. The Political and Economic Challenges of Natural Resource Wealth. Available at: https://resourcegovernance.org/sites/default/files/documents/nrgi_readers_compilation.pdf [Accessed on 16 September 2018].

Oxfam (2018) ICMM commits to Free Prior Informed Consent standard. Oxfam America The Politics of Poverty Blog. Available at: https://politicsofpoverty.oxfamamerica.org/2013/05/icmm-commits-to-free-prior-informed-consent-standard [Accessed on 16 September 2018].

Oxford Business Group (2015) The Report. Papua New Guinea 2015. Available at: https://www.pngcci.org.pg/wp-content/uploads/2015/10/Oxford-Business-Week-PNG-Report-2015.pdf [Accessed on 16 September 2018].

Pacific Islands Association of Non-governmental Organisations (2016) UNDRIP Important For The Pacific – PIANGO, Pacific Islands Association of Non-governmental Organisations. Available at: http://www.piango.org/our-news-events/undrip-important-pacific [Accessed on 16 September 2018].

Pacific Islands Report (2017) Seabed Mining Company Nautilus Minerals Unveils New Bridge In PNG's New Ireland, 26 April. Available at: http://www.pireport.org/articles/2017/04/26/seabed-mining-company-nautilus-minerals-unveils-new-bridge-pngs-new-ireland [Accessed on 16 September 2018].

Roche, C. and Bice, S. (2013) Anticipating social and community impacts of deep sea mining. Deep Sea Minerals and the Green Economy, Secretariat of the Pacific Community, Suva, pp. 59–80.

Rosenbaum, H. (2016) The socio-political and regulatory context for sea bed mining in Papua New Guinea. Available at: http://www.deepseaminingoutofourdepth.org/wp-content/uploads/DSMC-PNG-Report-on-Deep-Sea-Mining.pdf [Accessed on 16 September 2018].

Rosenbaum, H. and Grey, F. (2015) Accountability Zero: A Critique of the Nautilus Minerals Environmental and Social Benchmarking Analysis of the Solwara 1 Project. Deep Sea Mining Campaign, Melbourne.

SPC-EU workshop (no date) Papua New Guinea Offshore Mining Policy. Available at: http://dsm.gsd.spc.int/public/files/meetings/PNG Offshore Policy Raaymakers Pres - SOPAC Workshop.pdf [Accessed on 16 September 2018].

Steiner, R. (2009) Independent Review of the Environmental Impact Statement for the proposed Nautilus Minerals Solwara 1 Seabed Mining Project, Papua New Guinea, pp. 1–27.

The Conversation (2016) Ten things you never knew about the ocean's deepest places. Available at: https://theconversation.com/ten-things-you-never-knew-about-the-oceans-deepest-places-55172 [Accessed on 16 September 2018].

The Economist (2017) Papua New Guinea's incredible linguistic diversity, 20 June. Available at: https://www.economist.com/the-economist-explains/2017/07/20/papua-new-guineas-incredible-linguistic-diversity [Accessed on 16 September 2018].

Thomson, I. and Boutilier, R.G. (2017a) Measuring the Social License. Available at: https://socialicense.com/measure.html [Accessed on 16 September 2018].

Thomson, I. and Boutilier, R.G. (2017b) What is the Social License? Available at: https://socialicense.com/definition.html [Accessed on 16 September 2018].

Thomson, I. and Joyce, S. (2008) The social licence to operate: what it is and why does it seem so difficult to obtain, PDAC Convention. Available at: https://oncommonground.ca/wp-content/downloads/PDAC_2008_Social_Licence.pdf [Accessed on 16 September 2018].

Toovey, L.M. (2011) VMS Deposits of the World. Available at: https://investingnews.com/daily/resource-investing/base-metals-investing/copper-investing/vms-deposits-of-the-world [Accessed on 16 September 2018].

Trivedy, R. (2016) SDGs: Moving beyond business as usual in Papua New Guinea, Available at: https://www.centreforpublicimpact.org/beyond-business-usual-papua-new-guinea [Accessed on 16 September 2018].

United Nations Development Programme (2018a) Leaving No One Behind, Increasing Prosperity in PNG. Available at: http://www.pg.undp.org/content/papua_new_guinea/en/home/presscenter/articles/2018/03/16/leaving-no-one-behind-increasing-prosperity-in-png-.html [Accessed on 16 September 2018].

United Nations Development Programme (2018b) National Parliament staff receive legislative training. Available at: http://www.pg.undp.org/content/papua_new_guinea/en/home/presscenter/pressreleases/2018/08/16/national-parliament-staff-receive-legislative-training.html [Accessed on 16 September 2018].

World Bank (2015) Connecting the Unconnected in Rural Papua New Guinea. Available at: http://www.worldbank.org/en/news/feature/2015/09/29/connecting-the-unconnected-in-papua-new-guinea [Accessed on 16 September 2018].

World Bank (2016) Precautionary Management of Deep Sea Mining Potential in Pacific Island Countries. Available at: http://pubdocs.worldbank.org/en/125321460949939983/Pacific-Possible-Deep-Sea-Mining.pdf [Accessed on 16 September 2018].

World Bank (2017) Precautionary Management of Deep Sea Minerals. Available at: http://documents.worldbank.org/curated/en/349631503675168052/pdf/119106-WP-PUBLIC-114p-PPDSMbackgroundfinal.pdf [Accessed on 16 September 2018].

World Bank (2018) The World Bank in Papua New Guinea: Overview. Available at: http://www.worldbank.org/en/country/png/overview [Accessed on 16 September 2018].

Online resources

Business & Human Rights Resource Centre (2018) Nautilus Minerals. Available at: https://www.business-humanrights.org/en/nautilus-minerals [Accessed on 16 September 2018].

Central Intelligence Agency (2018) The World Factbook — Papua New Guinea. Available at: https://www.cia.gov/library/publications/the-world-factbook/geos/pp.html [Accessed on 16 September 2018].

Deep Sea Mining Campaign (no date) About the Deep Sea Mining Campaign. Available at: http://www.deepseaminingoutofourdepth.org/about [Accessed on 16 September 2018].

Economist Intelligence Unit (2018) Democracy Index 2017. Available at: https://www.eiu.com/topic/democracy-index [Accessed on 16 September 2018].

Extractive Industries Transparency Initiative (2016) The EITI Principles. Available at: https://eiti.org/document/eiti-principles [Accessed on 16 September 2018].

Extractive Industries Transparency Initiative Secretariat (2018) Papua New Guinea. Available at: https://eiti.org/papua-new-guinea [Accessed on 16 September 2018].

Globalsecurity.org (2018a) Papua New Guinea — Geography. Available at: https://www.globalsecurity.org/military/world/oceania/png-geography.htm [Accessed on 16 September 2018].

Globalsecurity.org (2018b) Papua New Guinea — Politics. Available at: https://www.globalsecurity.org/military/world/oceania/png-politics.htm [Accessed on 16 September 2018].

Index Mundi (2018) Papua New Guinea Economy Profile 2018. Available at: https://www.indexmundi.com/papua_new_guinea/economy_profile.html [Accessed on 16 September 2018].

Indigenous Rights and Resource Governance Research Group (no date) Free Prior and Informed Consent: The Right to Decide. Available at: http://whatis.fpic.info [Accessed on 16 September 2018].

International Seabed Authority (2018) Exploration Areas. Available at: www.isa.org.jm/contractors/exploration-areas [Accessed on 16 September 2018].

Mineral Policy Institute (no date) DSM in PNG. Available at: https://www.solwaramining.org [Accessed on 16 September 2018].

Nautilus Minerals (2015) Nautilus Minerals — Annual Report 2015. Available at: http://www.nautilusminerals.com/irm/PDF/1748_0/2015AnnualReport [Accessed on 16 September 2018].

Nautilus Minerals (2016) Invitation to comment on Facing Finance statement. Community Consultation. Available at: https://www.business-humanrights.org/sites/default/files/documents/Nautilus Minerals re Facing Finance Sep 2016.pdf [Accessed on 16 September 2018].

Nautilus Minerals (2018a) Consolidated Financial Statements for the quarter ended June 30, 2018 and June 20, 2017. Available at:

http://www.nautilusminerals.com/irm/PDF/2057_0/InterimFinancialStatementsJune302018 [Accessed on 16 September 2018].

Nautilus Minerals (2018b) FAQ. Available at: http://www.cares.nautilusminerals.com/irm/content/faq.aspx?RID=314 [Accessed on 16 September 2018].

Nautilus Minerals (2018c) How it will all work. Available at: http://www.nautilusminerals.com/irm/content/how-it-will-all-work.aspx?RID=433 [Accessed on 16 September 2018].

Nautilus Minerals (2018d) Management's discussion and analysis of financial condition and results of operations. Available at: www.nautilusminerals.com/irm/PDF/2024_0/MDAfortheperiodendedMarch312018 [Accessed on 16 September 2018].

Nautilus Minerals (2018e) Nautilus Minerals Environment Reports. Available at: http://www.nautilusminerals.com/irm/content/environment-reports2.aspx?RID=413 [Accessed on 16 September 2018].

Nautilus Minerals (2018f) Nautilus Minerals SMS Information. Available at: http://www.nautilusminerals.com/irm/content/sms-information.aspx?RID=422 [Accessed on 16 September 2018].

Nautilus Minerals (2018g) Nautilus Minerals The Pipeline. Available at: http://www.nautilusminerals.com/irm/content/png.aspx?RID=258 [Accessed on 16 September 2018].

Nautilus Minerals (2018h) PNG Community. Available at: http://cares.nautilusminerals.com/irm/content/png-community.aspx?RID=302 [Accessed on 16 September 2018].

Nautilus Minerals (2018i) Stakeholder Engagement, Nautilus Cares. Available at: http://www.cares.nautilusminerals.com/irm/content/stakeholder-engagement.aspx?RID=336 [Accessed on 16 September 2018].

Nautilus Minerals Niugini Ltd (2018) Preliminary Economic Assessment of the Solwara Project, Bismarck Sea, PNG. Available at: www.nautilusminerals.com/irm/PDF/1974_0/PEAoftheSolwaraProjectBismarckSeaPNG [Accessed on 16 September 2018].

Papua New Guinea Mine Watch (no date) Available at: https://ramumine.wordpress.com [Accessed on 16 September 2018].

Reporters without Borders (2018) 2018 World Press Freedom Index. Available at: https://rsf.org/en/ranking [Accessed on 16 September 2018].

South Pacific Internet Stats (2015) Papau New Guinea Internet Usage, Population and Telecommunications Reports, Internet World Stats. Available at: https://www.internetworldstats.com/sp/pg.htm [Accessed on 16 September 2018].

Statista (2017) Papua New Guinea: Internet penetration rate 2016. Available at: https://www.statista.com/statistics/767568/internet-penetration-rate-papua-new-guinea [Accessed on 16 September 2018].

The Commonwealth (2018) Member Countries — Papua New Guinea. Available at: http://thecommonwealth.org/our-member-countries/papua-new-guinea [Accessed on 16 September 2018].

The World Bank Group (2001) Stakeholder Analysis. Available at: http://www1.worldbank.org/publicsector/anticorrupt/PoliticalEconomy/stakeholderanalysis.htm [Accessed on 16 September 2018].

TMX (2018) Nautilus Minerals Inc. Stock Charting for Nautilus Minerals Inc. TMXmoney, TMX. Available at: https://web.tmxmoney.com/charting.php?qm_page=49499&qm_symbol=NUS [Accessed on 16 September 2018].

Transparency International (2018) Corruption Perceptions Index 2017. Available at: https://www.transparency.org/news/feature/corruption_perceptions_index_2017#table [Accessed on 16 September 2018].

United Nations (1982) Convention on the Law of the Sea. Available at: http://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf [Accessed on 16 September 2018].

United Nations Declaration on the Rights of Indigenous Peoples (2007) Available at: https://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf [Accessed on 16 September 2018].

United Nations Development Programme (2017) Human Development Reports. Papua New Guinea. Available at: http://hdr.undp.org/en/countries/profiles/PNG [Accessed on 16 September 2018].

World Data Atlas (2018) East New Britain — Papua New Guinea, Data and Statistics — knoema.com. Available at: https://knoema.com/atlas/Papua-New-Guinea/East-New-Britain [Accessed on 16 September 2018].

World Population Review (no date) Papua New Guinea. Available at: http://worldpopulationreview.com/countries/papua-new-guinea-population/ [Accessed on 16 September 2018].

News reports

Australian Doctors International (2018) About New Ireland PNG and Health issues faced by ADI volunteer doctors. Available at: http://www.adi.org.au/about-new-ireland [Accessed on 16 September 2018].

Berlinger, J. (2018) Papua New Guinea riots: State of emergency declared for 9 months. CNN World. Available at: https://edition.cnn.com/2018/06/18/asia/papua-new-guinea-riots-intl/index.html [Accessed on 16 September 2018].

Canadian Mining Journal (2007) Copper-gold-zinc resources — World's first seabed NI 43-101 numbers. 26 December. Available at: http://www.canadianminingjournal.com/news/copper-gold-zinc-resources-world-s-first-seabed-ni-43-101-numbers [Accessed on 16 September 2018].

Canadian Mining Journal (2008) Undersea development: Nautilus defers Solwara I equipment build. 24 December. Available at: http://www.canadianminingjournal.com/news/undersea-development-nautilus-defers-solwara-1-equipment-build [Accessed on 16 September 2018].

Canadian Mining Journal (2011) Mining lease: First ever underwater lease granted to Nautilus, 18 January. Available at: http://www.canadianminingjournal.com/news/mining-lease-first-ever-underwater-lease-granted-to-nautilus [Accessed on 16 September 2018].

Clouse, C.J. (2017) Can deep sea mining avoid the environmental mistakes of mining on land? The Guardian, 28 June. Available at: https://www.theguardian.com/sustainable-business/2017/jun/28/deep-sea-mining-environmental-mistakes [Accessed on 16 September 2018].

Creamer Media's Mining Weekly (2018) Seafloor miner Nautilus says CEO quits. Available at: http://www.miningweekly.com/article/seafloor-miner-nautilus-says-ceo-quits-2018-08-07 [Accessed on 16 September 2018].

Davidson, H. (2017a) Arrest warrant for PNG prime minister Peter O'Neill thrown out of court. The Guardian, 17 December. Available at: https://www.theguardian.com/world/2017/dec/18/arrest-warrant-for-png-prime-minister-peter-oneill-thrown-out-of-court [Accessed on 16 September 2018].

Davidson, H. (2017b) Death of Papua New Guinea journalist sparks national debate about domestic violence. The Guardian, 24 October. Available at: https://www.theguardian.com/world/2017/oct/25/death-of-papua-new-guinea-journalist-sparks-national-debate-about-domestic-violence [Accessed on 16 September 2018].

Davidson, H. and Doherty, B. (2017) Troubled Papua New Guinea deep-sea mine faces environmental challenge. The Guardian, 11 December. Available at: https://www.theguardian.com/world/2017/dec/12/troubled-papua-new-guinea-deep-sea-mine-faces-environmental-challenge [Accessed on 16 September 2018].

Hosie, E. (2017) Locals launch legal action against PNG Gov't over Nautilus deep sea project, Australian Mining, 8 December. Available at: https://www.australianmining.com.au/news/local-community-launches-legal-action-png-govt-nautilus-deep-sea-project [Accessed on 16 September 2018].

Jamasmie, C. (2014) First seabed mine to go ahead as Nautilus solves dispute with PNG, Mining.com. Available at: http://www.mining.com/first-seabed-mine-to-go-ahead-as-nautilus-solves-dispute-with-png-87314 [Accessed on 16 September 2018].

James, D. (2018) Sovereign wealth fund at least a year away, Business Advantage PNG. Available at: https://www.businessadvantagepng.com/sovereign-wealth-fund-at-least-a-year-away-says-kpmg-head [Accessed on 16 September 2018].

Loop PNG (2018) No legislative framework for offshore mining: Churches, 4 September. Available at: http://www.looppng.com/tags/seabed-mining [Accessed on 16 September 2018].

Lowrey, N. (2017) Legal action launched over the Nautilus Solwara 1 Experimental Seabed Mine, 8 December. Available at: http://www.deepseaminingoutofourdepth.org/legal-action-launched-over-nautilus-solwara-1 [Accessed on 23 September 2018]/

Lowrey, N. (2018a) Anglo American divests from Nautilus over risks of deep sea mining, Deep Sea Mining Campaign. Available at: http://www.deepseaminingoutofourdepth.org/anglo-american-divests-from-nautilus-over-risks-of-deep-sea-mining [Accessed on 16 September 2018].

Lowrey, N. (2018b) Nautilus' stock plummets as deep sea mining litigation proceeds. Available at: http://www.deepseaminingoutofourdepth.org/nautilus-stock-plummets-as-deep-sea-mining-litigation-proceeds [Accessed on 16 September 2018].

Mou, F. (2016) Dead sea creatures causing awful smell in Namatai, Loop PNG, 13 April. Available at: http://www.looppng.com/content/dead-sea-creatures-causing-awful-smell-namatanai [Accessed on 16 September 2018].

Owoseje, T. (2018) Papua New Guinea volcano erupts, sending villagers fleeing, The Independent, 25 August. Available at: https://www.independent.co.uk/world/papua-new-guinea-volcano-eruption-evacuation-manam-island-lava-a8507746.html [Accessed on 16 September 2018].

Papua New Guinea Mine Watch (15 December 2017) World-first mining case launched in PNG. Available at: https://ramumine.wordpress.com/tag/celcor [Accessed on 16 September 2018].

Papua New Guinea Mine Watch (17 July 2018) Nautilus' stock plummets as deep sea mining litigation proceeds. Available at: https://ramumine.wordpress.com/2018/07/18/nautilus-stock-plummets-as-deep-sea-mining-litigation-proceeds [Accessed on 16 September 2018].

Papua New Guinea Mine Watch (21 April 2018) Deep-sea mining possibly as damaging as land mining, lawyers say. Available at: https://ramumine.wordpress.com/2018/04/21/deep-sea-mining-possibly-as-damaging-as-land-mining-lawyers-say [Accessed on 16 September 2018].

Papua New Guinea Mine Watch (22 February 2018) PNG's losses from Solwara 1 currently over K350 million. Available at: https://ramumine.wordpress.com/tag/bsp [Accessed on 16 September 2018].

Papua New Guinea Mine Watch (26 December 2017) Chan reaffirms stance against Solwara 1 project. Available at: https://ramumine.wordpress.com/2017/12/26/chan-reaffirms-stance-against-solwara-1-project [Accessed on 16 September 2018].

Papua New Guinea Mine Watch (27 April 2017) Julius Chan drops opposition to experimental seabed mining, 27 April. Available at: https://ramumine.wordpress.com/2017/04/27/julius-chan-drops-opposition-to-experimental-seabed-mining [Accessed on 16 September 2018].

Papua New Guinea Mine Watch (28 February 2018) NGO fights mining plan on seabed. Available at: https://ramumine.wordpress.com/tag/jonathan-mesulam [Accessed on 16 September 2018].

Papua New Guinea Mine Watch (3 October 2017) Nautilus finally admits "limited benefits in Solwara One project". Available at: https://ramumine.wordpress.com/2017/10/03/nautilus-finally-admits-limited-benefits-in-solwara-one-project [Accessed on 16 September 2018].

Papua New Guinea Mine Watch (5 September 2018) Churches want to ban seabed mining, Papua New Guinea Mine Watch. Available at: https://ramumine.wordpress.com/tag/nautilus [Accessed on 16 September 2018].

Papua New Guinea Mine Watch (9 February 2018) Minister should listen to the people on Experimental Seabed Mining. Available at: https://ramumine.wordpress.com/2018/02/09/minister-should-listen-to-the-people-on-experimental-seabed-mining [Accessed on 16 September 2018].

Patjole, C. (2017a) Coastal Area Benefit for offshore mining projects. Loop PNG. Your News Now, 3 October. Available at: http://www.looppng.com/business/coastal-area-benefit-offshore-mining-projects-67450 [Accessed on 16 September 2018].

Patjole, C. (2017b) PNG a step down in global HDI, Loop PNG. Your News Now, 23 March. Available at: http://www.looppng.com/community/png-step-down-global-hdi-55067 [Accessed on 16 September 2018].

Perrone, A. (2017) Rosia Montana: the people, the mine and the World Bank, New Internationalist. Available at: https://newint.org/sections/agenda/2017/07/01/rosia-montana [Accessed on 16 September 2018].

Price, E. (2018) Papua New Guinea is Banning Facebook for a Month, Fortune, 29 May. Available at: http://fortune.com/2018/05/29/papua-new-guinea-banning-facebook [Accessed on 16 September 2018].

Roy, E.A. (2018) Papua New Guinea earthquake: UN pulls out aid workers from violence hit region, The Guardian, 5 April. Available at: https://www.theguardian.com/world/2018/apr/05/papua-new-guinea-earthquake-un-pulls-out-aid-workers-from-violence-hit-region [Accessed on 16 September 2018].

Samson, M. (2014) PNG seabed mining restarts following dispute settlement, South-East Asia & Pacific, Sci Dev Net, 5 June. Available at: https://www.scidev.net/asia-pacific/environment/news/png-seabed-mining-restarts-following-dispute-settlement.html [Accessed on 16 September 2018].

SBS News (2017) Peter O'Neill re-elected by parliament after chaotic election. Available at: https://www.sbs.com.au/news/peter-o-neill-re-elected-by-parliament-after-chaotic-election [Accessed on 16 September 2018].

SYM Mining and Construction Machinery (2018) Mineral deposits on the seafloor. Available at: https://www.sourcenomics.co.za/mineral_deposits_on_the_seafloor/31985.html [Accessed on 16 September 2018].

The National (10 August 2015) Project to benefit people, 10 August. Available at: https://www.thenational.com.pg/project-to-benefit-people [Accessed on 16 September 2018].

The National (15 October 2015) Offshore mining policy vital. Available at: https://www.thenational.com.pg/offshore-mining-policy-vital [Accessed on 16 September 2018].

The National (31 August 2018) Crime, tribal fighting a blot on PNG tourism, 31 August. Available at: https://www.thenational.com.pg/crime-tribal-fighting-a-blot-on-png-tourism [Accessed on 16 September 2018].

The National (7 August 2014) Nautilus deals with two govts. Available at: https://www.thenational.com.pg/nautilus-deals-with-two-govts [Accessed on 16 September 2018].

Tlozek, E. (2017) Bougainville Copper Limited's Panguna mine hits roadblock from protesters, ABC News, 16 June. Available at: http://www.abc.net.au/news/2017-06-17/bougainville-copper-panguna-mine-suffers-setback/8626762 [Accessed on 16 September 2018].

Books

Birney, K., Griffin, A., Gwiazda, J., Kefauver, J., Nagai, T. and Varchol, D. (2006) Potential deep-sea mining of seafloor massive sulfides: A case study in Papua New Guinea. Donald Bren School of Environmental Science and Management Thesis.

Boutilier, R.G. (2009) Stakeholder politics: Social capital, sustainable development, and the corporation. Routledge, 304 pp., ISBN: 9780804763035.