IMPACTS OF GOLD MINING ON SUSTAINABLE DEVELOPMENT
IN QUANG NAM PROVINCE, VIETNAM

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THESIS DECLARATION

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ABSTRACT

This research aimed to provide an original and substantial contribution concerning the impacts of gold mining on sustainable development in Quang Nam province, Vietnam. Specifically, the study examined the relationship between mining activities and the well-being of local residents in Phuoc Duc and Tam Lanh communes. Four research objectives were addressed in a series of peer-reviewed papers that investigate: i) increases in socio-economic wellbeing across Vietnam’s 63 provinces from 2009 to 2014; ii) local residents’ subjectivities and lived experiences regarding local mining operations; iii) differences in environmental impacts and socio-economic growth between mining and non-mining communities; and iv) Vietnam’s mining sector regulations and how they are operationalised ‘on the ground’. A mixed-methods research approach was used including content analysis, structured and semi-structured interviews, Q-methodology and regression analysis to address these objectives.

Results indicate that mining has been a driver of socio-economic wellbeing at the national level, yet the outcomes at the provincial level are more nuanced. Perceptions of mining operations suggest that local people are concerned with impacts to the standard of living, livelihoods, health and quality of life. However, these subjectivities are influenced by geography, demographics, history and culture. In addition, the research found that, when compared to non-mining communities, communes with active mines experienced job creation and decreased poverty rates, enhanced infrastructure and social development, but environmental degradation was pronounced. In regard to regulatory implications, findings indicated that although the nation’s regulations have been reformed over the past decade, many weaknesses still exist including complicated policies, inconsistency and fragmentation of regulations, corruption, a lack of transparency and dominance of State-owned enterprises.
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Chapter 1: Introduction

1.1. Introduction

Research on impacts of the extractive industries on the wellbeing and development of the resource-dependent regions in developing countries has been a longstanding area of interest to social scientists (e.g. Sachs and Warner, 1995, Ballard and Banks, 2003, Ding and Field, 2005, Hilson and Hilson, 2017). The nature of this interest is diverse, spanning issues associated with social inequality (e.g. Bebbington et al., 2008), uneven economic development (e.g. Akabzaa, 2009a), political upheaval (e.g. Auty, 1993), community livelihoods (e.g. Banks et al., 2013), and Indigenous peoples (e.g. Owen and Kemp, 2014). Much of this work has been undertaken from detailed cross-sectional analysis and case studies in different regional and local contexts. Indeed, there is now a bourgeoning literature that has provided detailed insights into the relationship between mining and aspects of human development (e.g. Horsley et al., 2015c). This work spans Central and South East Asia, Central and South America and Africa (e.g. Campbell and Akabzaa, 2009).

While the number of studies on mining in developing regions has increased in recent years, relatively little research has been undertaken on Vietnam. This is despite mining being an important part of the Vietnamese economy. Those studies that have been undertaken have tended to be quite narrow in focus, constraining their analysis to a particular locality or extractive sector. This includes studies of the Central Highlands that considered the relationship between bauxite mining and sustainable development (Hoa, 2009), socio-economic wellbeing and poverty reduction (Tran et al., 2012; Tran and Nguyen, 2010), and the relationship between mining and civil society (Carlyle, 2009; Marston, 2012; Morris, 2013).
In the past decade, the economy of Vietnam has been affected by two critical issues. First, the country has many of the hallmarks of the so-called ‘resource curse’ phenomenon (Vuong and Napier, 2014), in which economic performances of countries with large resource endowments tends to lag non resource dependent countries (Sachs and Warner, 2001). The reasons for this are complex and remain contested, but include the tendency to export unprocessed raw materials, the dominance of multi-national corporations headquartered in ‘core’ developed countries, rent-seeking behaviour, inflation and ‘crowding out’ effects that can adversely affect other sectors, notably manufacturing (e.g. Auty, 1993, Sachs and Warner, 2001, Ploeg, 2011).

The other critical issues, closely linked to the notion of a resource curse, is that volatile global commodity prices have resulted in inconsistent revenues to governments, the regular opening and closing of mines (or scaling up and down of production levels), employment uncertainty, and broader local economic instability (Besra, 2014, Hai, 2014, 2015). This, in turn, has led to social upheaval and difficulties in ensuring the social and economic wellbeing of people living in mining regions.

One of the challenges facing Vietnam is that the policy and institutional environment within which resource extraction is situated is not well attuned to the emerging needs at local and regional levels. Indeed, a number of studies have pointed to the policy and institutional landscape being excessively complicated, inconsistent and fragmented (Murfitt, 2009, Lien, 2011). Yet, there have been some reforms in recent years to help ensure that companies engaging in resource extraction recognise their responsibilities regarding environmental governance, sustainable development, local employment and corporate social responsibility more generally (e.g. MONRE et al., 2017, Ortmann, 2017). There has also been an explicit focus on ensuring transparency in the way in which companies operate through the Extractive Industries Transparency Initiative (EITI) (Bui et al., 2011, VCCI, 2014, Dau et al., 2015).
One of the central objectives of Vietnamese policy has been to ensure that the negative ‘resource curse’ type impacts of mining are minimised, and that some of the potential economic and social benefits are realised. Much of this is in the context of debates about sustainable development, and in particular ensuring that goals around economic and social development do not compromise natural environments. There are now a handful of studies beginning to emerge that suggest some of these gains are being realised, particularly in the case of gold production in Quang Nam province (Besra, 2013, 2014). Yet, this research suggests that ensuring the negative social, economic and environmental impacts of mining are minimised, remains a challenge.

Given the relative paucity of research on the relationship between extractive industries and wellbeing and development in Vietnam, the purpose of this thesis is to better understand these interactions. The thesis adopts a multi-scaler perspective, giving consideration to the broader national context before examining in more detail both processes and interactions occurring at regional and local scales. In this respect, the thesis draws on two case study regions to consider the relationship between extractive industries and wellbeing and development - Phuoc Duc and Tam Lanh communes, Quang Nam province. This research has been published in a series of refereed papers already in print (n=3), or currently under review (n=1).

1.2. Aims and objectives

The overall aim of this thesis was to make a substantial and original contribution to insights on the impacts of gold mining in the Quang Nam province in Vietnam on sustainable development of the region. It also provides an enhanced understanding of the link between mining and livelihoods and indicators of socio-economic wellbeing in the Vietnam context. In addition, it provides new insights into the regulatory implications on the mining sector across Vietnam. To this end, this thesis addresses four key objectives:
a. To examine the impacts of mining on the socio-economic wellbeing of 63 provinces across Vietnam during the period between 2009 and 2014.
b. To understand distinctive perceptions of local communities regarding the impact of gold mining in Phuoc Duc and Tam Lanh communes, Quang Nam province.
c. To investigate differences in socio-economic development and environmental protection between mining and non-mining communes in Quang Nam province.
d. To provide a critical appraisal of the regulatory frameworks governing Vietnam’s mining sector.

1.3. Economic background and mining context

After re-unification in 1975 the economic development paradigm of the Democratic Republic of Vietnam (DRV) largely replicated that of the Soviet Union (Ronnås and Sjöberg, 1991). In the DRV model, the approach was one of a centrally-planned economy (CPE) in which resources were allocated by the state and private sector interests were virtually non-existent. Industry, land and resources were owned by the state, which was also responsible for the development of infrastructure and the provision of key services. Yet, as with many centrally planned economies, by the mid 1980s difficulties had begun to emerge in terms of balance of payments, inflation, production difficulties and an inability to develop critical infrastructure and services (Riedel and Turley, 1999).

According to Diez (2016), due to deteriorating living conditions in the 1980s, the communist party decided to reform the economic system, coined “Doi Moi” (the renovation) during the 6th party congress in December 1986. The political elite opted for a gradual change of the economy, without changing the political system. The ‘renovation’ process aimed to create macroeconomic stability and a growth model based on cheap labour, natural resource extraction, rural development, environmental improvements and social protection.
In 1986 Vietnam commenced a series of economic and political reforms to facilitate the transition from a centrally planned economy towards a ‘socialist-oriented market economy’ (Chan et al., 1999). These reforms integrated centralised government planning with a number of market incentives, and encouraged the establishment of private firms, foreign investment and a more open system of trade. The outcome was a rapid transition that continued during the 1990s towards an open market economy. Indeed, during the 2000s Vietnam became deeply embedded in global systems of trade, finance and investment (Perkins and Vu, 2009). Exports substantially increased and played a key role in the increase of GDP, from approximately USD 120 million in 1990 to USD 724 million in 2000 and USD 3.6 billion in 2010 (GSO, 2017). Similarly, poverty rates also fell significantly from 58% in 1993 to 29% in 2002 and below 10% in 2010 (World Bank 2003, 2012). In 2008, approximately 90% of Vietnam’s industrial growth and job creation was a result of effective policies regarding foreign direct investment in the private sectors (Dapice et al., 2008).

According to Dapice et al. (2008), the notable characteristic of the Vietnamese economy was dualism (two systems in one economy). In this dualist system, State owned enterprises (SOEs) were regarded as a ‘pillar of the economy’ that operated alongside the emerging private sector. Yet, it has also been argued that SOEs contributed to a ‘crowding out’ in other sectors and stifled economic development in some regions (Pham et al., 2013). Indeed, being privileged, subsidised, supported and managed by the State, the dominant position of SOEs created monopolistic conditions in sectors such as mining (Nguyen, 2009). As an example, a World Bank report in 2011 indicated that the Vietnam National Coal-Mineral Industries Holding Corporation (Vinacomin) controlled, at that time, approximately 95% of the hard-rock mineral production in Vietnam.
This heavy involvement of government and SOEs in some parts of the economy has resulted in increasing concerns with regard to corruption, particularly in the mining industry. According to the Vietnam Chamber of Commerce and Industry (VCCI, 2014), for example, 78% of the mining companies in Vietnam agreed that they had to pay an unofficial fee for their businesses. Similarly, rent-seeking behaviours on the part of officials routinely violated the laws regarding the licensing process. For instance, due to group benefits or bribery, mining licenses were often granted to poorly qualified mining companies or incapable enterprises which were not specialised in the mining sector (VUSTA, 2012).

Alongside the role of SOEs in Vietnam, there has also been a recognition of shortcomings in legislation and institutions and the way that these are presenting challenges to economic development. Although the Vietnamese government has endeavoured to reform laws over the past two decades, there remain numerous weaknesses. In the mining sector, for example, the relevant legislation has been criticised as excessively complicated, inconsistent and fragmented (Murfitt, 2009, Lien, 2011). Indeed, according to Perkins and Vu (2009), reforms to industry policies appeared to have failed and their improvement has moved in the wrong direction. Among many challenges, the industrial policies were seen as presenting barriers rather than flourishing competition among industrial enterprises (Perkins and Vu, 2009). In addition, protecting and promoting SOEs was understood as the primary objective of much industrial policy by the relevant ministries (Perkins and Vu, 2009).

Although the National Government has endeavoured to reduce domination of SOEs, effectiveness of reforms is still a concern. For instance, privatisation was encouraged, but the State is still the biggest shareholder with at least 65% of equity in Vinacomin (58/2016/QD-TTg). Second, FDI has been warmly invited by legislations such as the 2014 Investment Law, but unexpected outcomes occurred in practice. An example is the case of Besra, a gold mining
company that had operated in Quang Nam province. Due to a failure to obtain mutual consensus, their extractive licenses were not extended and the company completely disinvested their businesses in Vietnam as of July 2017 (Besra, 2017a).

One of the key drivers underpinning a greater focus on foreign investment is the repayment of external debt (Nguyen et al., 2017). According to the World Bank (2017), the external debt stocks of Vietnam have exponentially increased from USD 12.785 billion in 2000 to USD 93.931 billion in 2015. The Ministry of Finance (2017b) indicated that the public debt of Vietnam in 2015 (domestic and external debt) was USD 94.297 billion which accounts for 61% of the GDP. According to the IMF (2016a), the debt may approach an unsafe level of 62.1% in 2016 and is predicted to account for 67.5% of GDP by 2021.

In light of high levels of public debt it is easy to see why FDI might be encouraged by the Government. This has meant that considerable effort has been directed towards encouraging investment that generates export earnings. Critical in this regard is the mining industry, and Vietnam has actively pursued a strategy to recognise the important role of mining for economic growth. This was highlighted by directive 24/CT-TTg/2017, in which the Government stated the importance of for the extraction industry in increasing national revenue in 2017. In addition, a number of regulations were enacted to enhance the regulatory frameworks supporting the mining industry. The notable example is decision 167/2007/QD-TTg, which paved the way for implementation of two ambitious bauxite projects and economic development of the Central Highlands (Morris, 2013).

In essence, there is a growing focus on the role of mining in promoting economic development within Vietnam and its regions. At a micro level, the extractive sector contributes to job creation, corporate social responsibility initiatives (CSR) initiatives and infrastructure
development (e.g. World Bank, 2011). At a macro level, the industry is purported to contribute to increase in regional economic growth, tax revenue, and human resource development (e.g. IFC, 2018).

1.4. Resource-based communities and resource extraction

One of the central themes taken up in this thesis is the way in which resource extraction, particularly in rural regions, is often associated with uneven spatial development. The evidence, however, is often complex and contradictory. One of the most cited perspectives on territorial development in the context of mining is the notion of ‘core and periphery’, which is closely linked to dependency theory (Smith and Steel, 1995). Dependency theory, formulated by Andre Gunder Frank in 1960s, argues that the economies of Third World countries (the periphery) have been highly dependent on developed nations (the core) (Juergensmeyer and Anheier, 2012).

In resource dependent communities, Smith and Steel (1995) argued that dependency theory has helped to explain the imbalance in development between the core (the urban) and peripheral (the rural), in which the core has more advantages than the periphery in regard to political power, corporate control and capitalist accumulation. Indeed, Markey et al. (2008) and Tonts et al. (2013b) have described peripheral regions as ‘resource banks’, where the latent capital is stored and later ‘drawn down’ through mining, but with most of the economic benefits accruing in the urban core.

The WorldBank (2011) claims that resource extraction is likely to reduce poverty by effective management. However, in Ghana, a rich mineral resource nation, after 25 years of continuous reform in the mining industry, a fundamental question still remains: whether or not the mining sector is the key driver for poverty alleviation and national economic development? (World
Bank, 2011, Akabzaa, 2009). A similar situation was also found in African countries where poverty reduction was considered to be much lower than in the rest of the developing world (Chuhan-Pole et al., 2017). The debate is intense, yet poverty in local communities directly impacted by extractive operations is pervasive (Akabzaa, 2009a).

Indeed, local communities have benefited from investment by mining companies, either directly or indirectly. Positive contributions include infrastructure development (e.g. Glen and David, 2012), job creation (e.g. Weber-Fahr et al., 2001), CSR initiatives (e.g. Jenkins and Yakovleva, 2006), and forward and backward economic linkages (e.g. Bloch and Owusu, 2012). In addition, the social and economic wellbeing of local communities has improved through direct health and education support and other spillovers (e.g. Pegg, 2006).

However, alongside these apparent benefits, mining has also been one of the most disruptive activities in terms of social wellbeing (Hatcher, 2012). Extractive activities have contributed to water pollution, deforestation, ecosystem disruption, acid mine drainage and chemical leakages (Bridge, 2004b). In addition, many companies have ignored rehabilitation after extraction (Doyle et al., 2007a).

There have also been significant health impacts from mining including mercury and cyanide exposure through gold extraction in Kenya (Bridge, 2004b), Buruli ulcers in Ghana (Tschakert et al., 2016), itching and skin rashes in the Philippines (Doyle et al., 2007a), and tuberculosis in South Africa (Basu et al., 2009).

Life in local communities has also been threatened due to dependency on mining. The issue emerges when mining operations cease which leads to negative consequences including unemployment, income reduction, and lack of social support services (Knierzinger, 2014). Due
to the nature of mining, extractive operations are often undertaken in remote or isolated areas where fewer alternatives to improve livelihoods and less stringent mining laws exist (Fernando, 2017). Therefore, the lives of local people can become more difficult when mines close (MMSD, 2002b).

One of the challenges for the extractive sector is emergence of tension between local people and mining enterprises (e.g. Bebbington and Williams, 2008). Reasons are diverse including environmental degradation, ineffective policy, uneven benefit sharing, or insignificant reinvestment (e.g. Kemp et al., 2011). However, intense conflicts indicate the failure of authorities’ to manage mining companies and companies inability to obtaining a ‘social license to operate’.

The examples outlined above suggest that finding a balance between economic development, social wellbeing and environmental protection in the context of mining in developing countries is extremely difficult. Indeed, there are often complex trade-offs associated with mining activities, and quite often the elements being ‘traded off’ are of social and/or environmental concerns. According to Eggert (2006), mining will only be sustainable when environmental quality and social justice are regarded as central to the activity.

While much of the discourse on mining and sustainable development points to problematic aspects of the industry, some scholars are more circumspect. For example, Bridge (2004) and Davis and Tilton (2002) argue that mining should be seen as a process to create wealth for a society and convert natural capital to human capital. In some instances, a significant proportion of mining revenues have been returned to communities with benefits to education, technology and other human resources improving the well-being of future generations (Eggert, 1995, 2001). The return can be seen as compensation for resource depletion, and sustainability can
be achieved through saving and reinvesting in society, in which a proportion of the net annual revenue from selling mining products is contributed (Mikesell, 1994).

1.5. Resource extraction in Vietnam

Mineral extraction in Vietnam has a long history. Since the first century B.C., copper, zinc, tin and gold have been extracted (Kušnír, 2000). After the French invasion in 1884, resource extraction including coal, gold, tin, and other minerals was intensified and these minerals were exported to France (Blondel, 1931). During the Second World War and Japanese occupation, the majority of extracted minerals were exported to Japan and after independence in 1956, with the support from China and Soviet Union, the mining industry in the North of Vietnam further developed (Kušnír, 2000). Export activities during this period were primarily to other Communist countries. The re-unification of the country in 1975, and in particular the political and economic reforms outlined above, have given rise to an increasing range of opportunities for Vietnam’s mineral resource sector.

Vietnam’s extensive reserves of minerals have made it an increasingly significant player in the global commodities industry (Weber-Fahr et al., 2001). It has more than 5,000 ore occurrences representing 60 different kinds of minerals such as coal, bauxite, gold, tin, zinc, copper, titanium and manganese (Tran et al., 2012). According to Morris (2013), bauxite reserves in Vietnam are high and are estimated at between 5.5 to 8 billion tons. In 2014, production of tungsten and titanium were ranked 2nd and 5th globally (Reichl et al., 2016), while in 2015 Vietnam’s bismuth extraction accounted for 35% of the world’s production (Brown et al., 2017). While most of Vietnam’s mineral deposits are located in the North of the country, bauxite reserves exit in the Central Highlands and gold mines are located in the Central provinces (Wu, 2007).
Extractive industries have been strongly supported by the Vietnamese Government. For instance, the 2010 mineral law was passed to replace the mineral law 2005 and 1996. In addition, a number of ‘under laws’ were enacted to underpin the mining industry such as decision 2427/QD-TTg on “mineral resources strategy to 2020, with a vision toward 2030”, decision 167/2007/QD-TTg for bauxite and decision 6000/QD-BCT/2013 for gold, copper, and nickel. These documents were acknowledged as providing legal frameworks for mining operations in Vietnam. According to the Law on Promulgation of Legislative Documents (80/2015/QH13), the ‘under law’ refers to legal documents which have been enacted by the Standing Committee, the Prime Minister, several Ministries and the Provincial Peoples’ Committees. ‘Decisions’ are legal documents disseminated by the Prime Minister and Provincial Peoples’ Committee.

Given the increasing scale of production, it is no surprise that the mineral resources sector plays a key role in the Vietnamese economy. The General Statistics Office (GSO, 2017) indicated that, in the last decade, the mining industry contributed USD 4.445 billion to the GDP in 2005 which has increased to USD 20.143 billion in 2015. In addition, mining contributed to around 10% of the total annual GDP and 3.8% of export earnings in 2015 (GSO, 2017), with the total value of all FDI mining projects at the end 2016 sitting at around USD 3,498.9 million (GSO, 2017). As Pegg (2006) notes, mining has been important in terms of indirect economic contributions through job creation, tax revenues, infrastructure development and technological spillovers.

While there has been considerable recent policy interest within Vietnam that has aimed to mitigate against the negative economic, social and environmental impacts of mining, there are nevertheless ongoing concerns. Bauxite projects in the Central Highlands, for example, faced widespread opposition as a result of public concerns about national interests and regional
development issues (Carlyle, 2009). In addition, these projects have caused serious environmental problems, including the collapse of a red mud dam and the subsequent discharge of water contaminated with sodium hydroxide (CODE, 2009, Dung, 2011). Similarly, gold mining in Quang Nam has been controversial, contributing to a significant tax debt for authorities and local service providers, and rising unemployment for local people when the mine was closed July 2014 (Besra, 2014). This led to tensions between the local communities and the companies (Besra, 2013, Hai, 2015).

The industry is also characterised by ongoing volatility, largely linked to movements in global commodity process. Not only does this affect the performance of the national economy, but also those local and regional economies dependent on the industry. Indeed, the falling gold price on the international market was likely one of the key reasons that led to substantial revenue reduction and tax owed to the government and closure of gold mining operations in Quang Nam province (Son, 2013, Besra, 2017a). Coal production faces similar issues. In 2013, for instance, the decline of the global coal market resulted in Vinacomin, the biggest coal producer in Vietnam, scaling back production and reducing export volumes from 1.2 million ton per month to approximately 0.5 million ton per month (Nhi, 2013). The reduction in production resulted in a contraction of employment and a decrease in local economic activity in those localities the firm operates.

1.6. Gold extraction in Quang Nam Province

One of the important characteristics of resource extraction is that mines are confined to particular mineral provinces, and therefore the impacts are often geographically quite concentrated. This makes the analysis of the social, economic and environmental impacts of mining well suited to intensive local analysis. In the context of this thesis, Quang Nam Province provides particularly valuable insights, largely as a result of its gold industry. Quang
Nam has two gold mines of significance. The first is the Phuoc Son mine, which is located in Phuoc Duc commune, Phuoc Son district in the western highlands of Quang Nam province. This property is approximately 100 km southwest of Tam Ky city, the capital of Quang Nam province, and 90 km northwest of Da Nang city, the third largest city in Vietnam (Steven and Fulton, 2008). The second is Bong Mieu mine, which is located in Tam Lanh Commune, Phu Ninh district in the southeast corner of Quang Nam province. This property is approximately 30 km northeast of Tam Ky city and 80 km northeast of Da Nang (Stevens and Fulton, 2007) (Figure 1.1).

Figure 1.1: Locations of Phuoc Duc and Bong Mieu gold mines (adapted from administration maps of Quang Nam province)

Gold extraction in the Phuoc Son and Bong Mieu regions has a long history. The first gold mining activities in Phuoc Son were undertaken during French occupation, 1857-1945 (Steven and Fulton, 2008). In contrast, the main gold mining activities occurring in Bong Mieu was
under the direction of France from 1895-1941 (with a pause occurring between 1919 and 1933). Following the Japanese invasion during the Second World War, gold mining operations in Bong Mieu ceased. When the Vietnamese-American war ended in 1975, it was taken over and managed by the Vietnamese government (Stevens and Fulton, 2007).

In recent decades, gold production in both sites has been undertaken by the Canadian owned Besra Gold Inc. According to the Investment License (140/GP/1991), Bong Mieu mine was permitted to operate in an area of 3,000 hectares for 25 years from 1991. The company was involved with the property since 1997, constructing the Bong Mieu Central open pit mine and associated infrastructure in 2005 and 2006 with commercial gold production starting in the fourth quarter of 2006 (Olympus, 2010). In Phuoc Son, the first exploration licenses (1953 & 1955 QD/DCKS) were granted in 1998. In the Investment License (2355/GP/2003), Phuoc Son mine was permitted to operate within a tenement of 7,000 hectares for 30 years from 2003. However, in the renewed exploration license in 2008 (67/GP-BTNMT), the company was allowed to explore within an area of 42 km². Subsequently, in 2011, a modern gold plant was commissioned in Phuoc Son (Besra, 2016a).

Plate 1.1: Phuoc Son gold mine during the temporary closure (Photo by Nhi Nguyen, 2015)

Obtaining exploration and investment licences for both Phuoc Son and Bong Mieu was complicated. The process required approvals from numerous government agencies at both
national and provincial levels. For example, exploration licences were managed by the Ministry of Industry (MOI), whilst the investment licences were administered by the Ministry of Planning and Investment (MPI). After 2006, while the mining license and exploration license were authorised by the Ministry of Natural Resources and Environment (MONRE), the investment acknowledgement license was granted by Quang Nam People’s Committee (QNPC) (Table 1.1).

**Table 1.1: Summaries of exploration and investment licences for Phuoc Son and Bong Mieu mines.**

<table>
<thead>
<tr>
<th>Locations</th>
<th>Phuoc Son</th>
<th>Bong Mieu</th>
</tr>
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<tbody>
<tr>
<td>Licenses</td>
<td>Decision No Year Agencies</td>
<td>Agencies Decision No Year</td>
</tr>
<tr>
<td>Investment</td>
<td>2355/GP 20/10/2003 MPI</td>
<td>140/GP 05/03/1991 SCCI</td>
</tr>
<tr>
<td>EIA approval</td>
<td>1698/QD 19/11/2004 MONRE</td>
<td></td>
</tr>
<tr>
<td>Mining permit</td>
<td>116/GP 23/01/2006 MONRE</td>
<td></td>
</tr>
<tr>
<td>Exploration</td>
<td>07/GP 10/01/2008 MONRE</td>
<td>67/GP 2125/GP 10/01/2008 MONRE</td>
</tr>
<tr>
<td>Investment</td>
<td>331022000010 08/07/2008 QNPC</td>
<td></td>
</tr>
</tbody>
</table>

The volume of gold production at both sites substantially increased during the period from 2007 to 2013. Figure 2.2 shows that in 2007 the volume of gold production was approximately 10,000 ounces (equivalent 280 kg). In 2013, production increased to 60,187 ounces (equivalent 1,685 kg). Anecdotally, the real volumes of gold produced at each mine site have been kept confidential and would not be released by the mining company. However, from July 2014 to August 2016, operations of gold production of Besra were suspended by the Quang Nam authorities due to taxes owed to the government (Besra, 2014). In mid-August 2016, the suspension decision was lifted and gold production of the company re-opened (Besra, 2016b). Nevertheless, due to a failure of negotiation with the Quang Nam authorities, Besra’s production licences were not extend and in July 2017, the company disinvested completely of its businesses in Vietnam (Besra, 2017a). It is noted that this issue was complicated, non-transparent and the public do not know what the reasoning underlying the decisions.
Figure 2.2: Volume of gold production at Phuoc Son and Bong Mieu, 2006-2013 (Besra, 2016a).

Outside of mining, Phuoc Duc (Phuoc Son mine) and Tam Lanh (Bong Mieu mine) are remote and mountainous regions and their economies largely depend on just two other industries - agriculture and reaafforestation. According to the Phuoc Son Statistics Office (PSS, 2015), in 2014 more than 60% of the Phuoc Duc population was Indigenous and the poverty rate was approximately 50%. In contrast, more than 99% of the population in Tam Lanh was non-Indigenous and the poverty rate was below 5% in 2014 (PNS, 2015).

Indigenous people in Phuoc Duc form a close-knit community. They comply with their customs, trust the village head and live together in villages associated with their ethnicity. In each village, a common house is important and a place where most community activities take place. Except a number of people employed by the mining company, a majority of people in Phuoc Duc worked on their own farms and it is difficult to identify whether or not they are employed, underemployed or unemployed. The largest town in the region is Kham Duc, which is located approximately 15 km by road to the northeast. To some extent, the extractive operations provided benefit for people in Phuoc Duc and Kham Duc, particularly in terms of infrastructure development, job creation and CSR initiatives.
Plate 1.2: Community house of the Gie-trieng people, village 4, Phuoc Duc commune. This village is adjacent to the Phuoc Son mining site (Photo by Nhi Nguyen, 2015).

In contrast, non-Indigenous (Kinh) people in Tam Lanh are more open, accept migrants and maintain a diversified income. The relationships among people in the community are not as formal and the role of the village head is not as important as in Indigenous communities. However, in the rural context of Vietnam, identifying a person who is employed, underemployed or unemployed is challenging. In the context of rural Vietnam, farmers account for the majority of the population and are self-employed. Their work depends on climatological patterns and is seasonal. For example, in the harvesting seasons, they are very busy and work continuously with little down time. However, in the rainy season or after harvest, they may stay at home and have nothing to do. The census is based primarily on formalised employment and defining this form of more seasonal employment in rural regions is difficult.

The distances from Tam Lanh commune to Phu Thinh town (centre of Phu Ninh district) and Tam Ky city (capital of Quang Nam province) are approximately 20 and 25 km by road, respectively. Therefore, it is more advantageous for the people of Tam Lanh to access these towns for trading, health care, education and employment. Similar to Phuoc Duc, the mining company contributed positively to Tam Lanh communities in regards to job creation, infrastructure development, and service provisions through backward linkages.
Plate 1.3: A ten kilometre upgraded road connecting the National Highway with the Phuoc Son mining site. The road was built by Besra and is the primary connection to the outside world for villages 1, 2, 3, and 4 in Phuoc Duc commune (Photo by Nhi Nguyen)

Indeed, the relationship between gold mining and development in Quang Nam is complicated and multifaceted. There has been significant debate over the mines’ role in development over recent years. Although negative consequences are apparent, the mining company provides contributions to local communities and has aided in the socio-economic growth of the region. Therefore, both advantages and disadvantages brought by the mining company to the area has been seen as two sides to the same coin which will be discussed in detailed in Chapters 4 and 5 of the thesis.

1.7. Thesis outline

This thesis is organised into seven Chapters. Chapter 1 has provided an introduction to the research including the aim, objectives and overview of the relationship between mining and socio-economic development in the context of Vietnam and Quang Nam province, where the research was carried out. Chapter 2 identifies methods which were employed for the research. Chapters 3 through 6 are comprised of the four papers which form the base of the thesis. These papers are as follows:

Chapter 3: This paper aims to provide a broad, contextual overview of mining and development in Vietnam. It is an introduction and foundation for the subsequent three papers
in the thesis. The central objective of the paper was to examine how the mining sector in Vietnam has influenced socio-economic wellbeing across 63 provinces during the period, 2009-2014. More specifically, it considers the extent to which mining has contributed to poverty reduction, income and unemployment. The paper was published in *The Extractive Industries and Society*:


**Chapter 4:** This paper examined community perceptions concerning the impact of gold mining in Phuoc Duc and Tam Lanh communes, Quang Nam province, Vietnam. It builds on the Sustainable Livelihoods framework and the work of Tonts et al. (2013a) and Horsley et al. (2015), and evaluated the perceived value and validity of indicators of development amongst local, government and mining company stakeholders. Based on data collection and analysis using a Q-sort methodology, the paper unpacks local community perspectives and lived experiences of changes due to mining activities. The paper was published in *Resource Policy*:


**Chapter 5:** This paper built on the research presented in Chapter 4 moving from an evaluation of indicators of mining impacts to a comparison of mining related impacts in mining and non-mining communities. The indicators identified in Chapter 4 were used as a foundation for this portion of the research, but through work with local communities were further expanded to include themes related to economic development (e.g. job creation, poverty rates, budget contributions and infrastructure development), society and culture (e.g. Corporate Social
Responsibility (CSR), tensions and social upheaval), and environmental impacts (e.g. water pollution, health effects and forest degradation). Based on data collected from the field, the positive and negative impacts of mining were compared between mining and non-mining communities. This paper was published in *Sustainability*:


**Chapter 6**: This paper examined how mining regulations have affected Vietnam’s mining industry, and how regulatory reforms are required to attract future foreign direct investment (FDI) and create a fair competitive environment for all businesses. In particular, the paper aims to identify the key components of a modern mining regulatory framework, and examine the extent to which the Vietnamese context reflects these characteristics. Regulatory improvement can help reduce domination of State-owned enterprises (SOEs), corruption, licensing and transparency while minimising challenges such as environmental degradation and unequal development. Moreover, the ineffectiveness of Vietnam’s current regulatory framework is discussed including a discussion of reform which would most benefit Vietnam’s mining industry. This paper is under review in *Journal of Environmental Policy and Planning*:


**Chapter 7**: This Chapter provides a summary and conclusion of the findings presented in Chapters 3 through 6. This Chapter includes a general discussions for policy-makers’ regarding the future of mining and development in Vietnam. This discussion focuses on the wellbeing of resource communities, resource dependence and regulations, key themes of this research.
1.8. Conclusion

In conclusion, this thesis aims to provide new insights into the relationship between mining and development in Vietnam, particularly gold production in Quang Nam province. The research offers both theoretical foundations and empirical evidence in regard to the impacts of extractive operations on the environment and socio-economic wellbeing at a national level and in the gold mining region(s) of Quang Nam. The thesis presents the perspectives of residents in mining communities, as well as non-mining communities in close proximity to extractive activities. The differences in wellbeing between mining and non-mining communities in Quang Nam province were investigated to better understand the advantages and disadvantages that come from mining. Finally, the weaknesses of Vietnam’s current mining regulations are explored as well as the challenges to meaningful reform.
Chapter 2: Research Methods

2.1. Introduction

This chapter presents an overview of the methods used to conduct the research undertaken for this thesis. To examine and compare the impacts of gold mining on socio-economic wellbeing, livelihoods and the environment in mining and non-mining communities in Vietnam, this study employed a mixed-methods case study approach. The chapter provides an overview of the overall research design, before considering the specific objectives and the data collection and analytical techniques used to address these. The chapter also offers a justification for the case study localities. Given that this is a thesis by publication, it is important to note that the purpose of this chapter is to provide a general overview of the approach taken in the research, with the specific chapters providing a more detailed overview of the methods.

2.2. Theoretical and conceptual framework

A range of different perspectives have been used to examine the relationship between mining and rural communities, though in the context of developing countries much of the recent debate has been dominated by an interest in sustainable development, sustainable livelihoods (DFID, 1999, FAO, 2005) and the notion of “corporate social responsibility” (Campbell, 2012). While representing quite diverse bodies of thought, each concept is of direct relevance to this research and are therefore reviewed here, followed by a synthesis that draws together the common threads that informed this project.
2.2.1. Mining and sustainable development

The much quoted definition from the World Commission on Environment and Development (WCED) states that “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987a) (p.41). In other words, economic activities should be concerned with impacts on the environment and social fabric of the communities development is applied to.

Globally, the mining industry has played an important role in economic development, particularly in developing countries. Specifically, the industry has contributed significant budgets for national economies through exports, royalty and taxable income (Aryee, 2001, Ford, 2014). In addition, it has created employment opportunities for thousands of unskilled and skilled workers (UNEC, 2011, Knierzinger, 2014). Importantly, the sector has been a key factor in poverty reduction by attracting millions of dollars to developing nations through foreign direct investment (FDIs) (Akabzaa, 2009b). In summary, mining has been a crucial part of national revenues in resource-dependent countries.

At a more local level, there have also been considerable impacts related to the mining industry, particularly in the area of economic development, through the creation of employment, alleviation of poverty and development of infrastructure (Das, 2001, Knierzinger, 2014). Moreover, local communities have benefited from the Corporate Social Responsibility (CSR) activities of the mining industry. For example, from 1996-1998, a mining project in Ghana spent more than US$ 8 million for medical clinics, schools, electricity, water, roads and other services (Aryee, 2001). Thus, examples of how CSR has contributed to the social development of local mining communities can be identified throughout the developing world (Campbell, 2012).
However, alongside of the apparent benefits, mining has been cited as one of the most disruptive activities in terms of both health and social wellbeing (Hatcher, 2012). Extractive activities have caused water pollution, deforestation, land degradation, ecosystem disruptions, acid mine drainage and chemical leakages (Bridge, 2004a). In addition, many companies have ignored rehabilitation requirements after extraction. In 2003, in the Philippines, for instance, over 800 abandoned mine sites were identified as not being properly rehabilitated or ignored altogether. As a result, landscapes are damaged and many locations will never fully recover (Doyle et al., 2007a).

Significant health impacts have also been identified as a result of mining initiatives. For example, mercury and cyanide exposure from gold extraction was identified to be the cause of health impacts to miners in Kenya (Bridge, 2004a). Similarly, local peoples in Mindanao, Philippines have been identified to suffer from dermatological issues attributed to mining operations (Doyle et al., 2007a). In South Africa, 7% of miners were diagnosed with tuberculosis which is ten time higher than average infection (Basu et al., 2009). In some cases, these impacts have forced out-migration from locations effected by mining, such as the case with villagers in Baphli Mali, India (Das, 2001).

One of the longstanding concerns of mining is the impact on social equality. In mining towns in Guinea, for instance, a gap was identified between “workers aristocracy” and unemployed people (Knierzinger, 2014). While local farmers earned less than one dollar per day, senior staff of bauxite companies were provided with a plot of land and access to good schools. This entrenched the existing hierarchies and undermined social development processes (Knierzinger, 2014).
Local communities can also be exposed due to mining dependencies. For example, when an aluminium factory in Fria, Guinea stopped production in April 2012; electricity, water and other services were reduced or cut to the community. High unemployed ensued which resulted in reduced school attendance and food insecurity, and reductions in health care provision resulted in increased mortality rates. Importantly, the majority of the town’s economic activities were dependent on mining activities and the lack of economic diversification resulted in significant impacts to livelihoods (Knierzinger, 2014).

Mining has also been associated with conflicts over land rights. In Orissa in India, a bauxite mine displaced residents of 11 villages with no relocation provisions provided. When the project commenced, large areas of agricultural land were converted to mine infrastructure and dewatering ponds (Balagopal, 2007). Residents of those villages lost more than 75 per cent of their available arable or inhabitable land. Consequently, livelihoods of more than 2,000 families came under threat as 98 percent were depended on agriculture (Das, 2001).

The examples outlined above suggest that finding a balance between economic development, social wellbeing and environmental needs in the context of mining is extremely difficult. Indeed, there are often complex trade-offs associated with mining activities, and social and environmental concerns. According to Eggert (2006), mining will only be sustainable when environmental quality and social justice are regarded as central to the activity.

While much of the discourse on mining and sustainable development points to problematic aspects of the industry, some scholars are more circumspect. For example, Bridge (2004) argues that mining should be seen as a process to create wealth for a society and convert natural capital to human capital (Bridge, 2004a). In some instances, a large proportion of mining
revenues have been returned to communities with benefits to education, technology and other human resources which improves well-being of future generations (Eggert, 1995). The return can be seen as compensation for resource depletion but sustainability can be achieved through savings and reinvesting in local communities, in which a proportion of the net annual revenue from selling mining products is contributed (Mikesell, 1994).

### 2.2.2. Sustainable livelihoods

Sustainable livelihoods are defined as “the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain its capabilities and assets both now and in the future, while not undermining the natural resource base.”(Chambers and Conway, 1991), (p.6).

As a concept to support the implementation of poverty reduction strategies, the sustainable livelihood framework (SLF) identifies how livelihood assets are influenced by political structures and process that, in turn, affect the outcome of livelihood strategies. SLF is seen as an important tool to help understand and analyse the livelihoods of the poor. In addition, it is used to evaluate effectiveness of poverty reduction programme. The SLF is a human-centred approach which helps participants with different opinions get involved in the livelihood debates and find approaches to interacting (DFID, 1999).

Importantly, the framework highlights the role of assets or poverty reducing factors that mitigate the impact of shocks to the system (the vulnerability context). It provides an approach to understanding how household livelihood systems interact with the outside environments including both the natural environment and policy and institutional context (FAO, 2005).
According to DFID (1999), livelihood assets, known as resources or capitals, are classified into five different groups:

- Human capital: skills, knowledge, ability to labour and good health.
- Social capital: social resources such as networks, connectedness, memberships of more formulised groups, relationships of trust.
- Natural capital: natural resource stocks such as trees, land, forests and water.
- Physical capital: basic infrastructure and producer goods needed to support livelihoods such as homes, transport infrastructure, water supply and sanitation, energy and access to information.
- Financial capital: available stock and regular inflows of money such as savings, pensions, remittances.

In reality, there are interrelationships between the five capitals. For example, a person owns a piece of land (natural capital) which he or she can use to make money or potentially obtain a loan (financial capital). Likewise, having livestock (financial/natural capital) can result in heightened levels of respect or connectedness to the broader community (social capital). In addition, livestock can be sold (converted to financial capital) and used for work (physical capital) and are, in reality, natural capital in their own right (Horsley et al., 2015b).

Much of the literature on sustainable livelihoods has been applied to understanding the complexities of development in the context of agrarian communities. Only recently has SLF been applied to understanding the link between development and mining (Akiwumi, 2011, Schoeffel, 2012). The value in this approach is that it offers a more nuanced understandings of how mining might shape development at the local scale, and importantly how local people and industries might develop strategies that improve or enhance one or more of the ‘five capitals’.
In addition to analytical value provided by the SLF, the five ‘capitals’ can be seen as a points of intervention (Morse et al., 2009). Each of attribute of the SLF supports selective process of indicators to measure impacts of mining at local, regional and national scales. Indicator selection can be based on either a “top down”/“bottom up” approach or value/measurement approach. As a result, five capitals, a key element of SLF, drive the methodology used to examine the interaction between mining and development (Horsley et al., 2015b).

2.3. Overall research design

Selection of an appropriate research methodology depends largely on the overall goal and objectives of the research (Lawer, 2013). This study employed a mixed-methods case study approach drawing on both quantitative and qualitative techniques. The overall aim of the research was to make a substantial and original contribution to insights on the impacts of mining in the Quang Nam province in Vietnam on sustainable development of the region. To this end, the research presented in this thesis employed an ‘anomalies’ case study research methodology as discussed by Ridder (2017) to achieve the goals and objectives of this research.

From a methods perspective, recent scholarly literature has highlighted the use of mixed-methods approaches across the social science, particularly in the context of rural and regional development (e.g. Devereux and Sharp, 2006, Davis and Baulch, 2011). In the case of this thesis, the advantages of this type of approach is to provide comprehensive insights into the impacts of mining activities, as quantitative and qualitative methods provide complementarities (Lund, 2012) and allow for the triangulation of different data sources (Morse, 1991), thereby increasing the overall reliability of the study’s results (Chapman, 2015). Figure 2.3 provides an overview of the questions driving this research, as well as the data collection approaches and data analysis techniques used to address each.
Figure 2.3: The research design, outlining the data collection methods and analytic techniques used to address each research objective

Overall, the approach used is in this research falls under the guise of case study methodology as described by Yin and others (e.g, Stake, 1995, Yin, 2014). From an operational standpoint, Weick (1984, p.121) defined case study research as “a way to systemise observations”. A case study research design typically adheres to four characteristics: i) it does not explicitly control or manipulate variables; ii) it studies a phenomenon in its natural context; iii) it studies the phenomenon at one of a few sites; iv) it makes use of qualitative and quantitative tools and techniques for data collection and analysis (Cavaye, 1996, p. 229).

More recently, Ridder (2017) has classified case studies into four categories. The first is ‘no theory first’, which aims to obtain extensive information about the study location without being limited by a particular theory (Eisenhardt, 1989). The second is ‘gaps and holes’, which focuses on the identification of specific research gaps and holes in existing theory with the ultimate
goals of advancing theoretical understandings (Ridder, 2016). The third is ‘social construction of reality’, which prescribes to the notion that people are socially and historically connected (social construction) to place and through sharing their ideas and beliefs are able to shape action or inaction (Guba and Lincoln, 2005). The fourth is ‘anomalies’ where a case study based research question derived from curiosity examines what is ‘interesting’ or ‘surprising’ about a location including social situations that cannot be explained by existing theory (Burawoy, 1998).

While, there are some overlaps across the four case study categorisations, and it is difficult to classify case study research as one specific type, the ‘anomalies’ case study typology best describes the approach taken here as the research is driven by curiosity and an aspiration to understand the perceived impacts of mining on local communities (Burawoy, 1998). The ‘anomalies’ case study typology has been applied to numerous studies focused on resource allocation (Gilbert and Christensen, 2005) and behavioural economics (Kahneman and Thaler, 2006) and provides the theoretical foundation for the research found within this thesis. To this end, the following discussion provides an overview of the data collection and analytic approach used to address each research objective.

Indicators selected for each sub study in this thesis are comparable and compatible, and have been informed by relevant scholarly research. In Chapter 3, the selection of indicators is based on the well-being framework developed by White (2009) which has been applied to other similar studies in Bangladesh, Ethiopia, Peru and Thailand. These indicators include measures of poverty, income, employment, livelihoods, health, and education. Similarly, the indicators used in Chapter 4, were based on the sustainable livelihood framework and mirror those used by (Tonts et al., 2013a) for examining mining impacts on local communities in African
including Ghana, Zambia, Rwanda and Indonesia. These indicators were also chosen with intent to measure, income, employment, livelihoods, health, and education.

2.3. Objective 1: Impacts of mining on the socio-economic wellbeing of Vietnam’s provinces

The first objective of the thesis was to examine the role of mining in enhancing socio-economic wellbeing across Vietnam’s provinces during the nation’s most recent mining boom from 2009 to 2014. The analysis employed two approaches. First, a content analysis was used to identify variables and collect data such as poverty rates from the General Statistics Office. Next, a longitudinal analysis (Menard and Menard, 2007) was conducted to examine changes in wellbeing using census data for Vietnam’s 63 provinces, including the metropolitan cities of Ha Noi, Ho Chi Minh and Da Nang and the highly industrially provinces of Binh Duong, Dong Nai and Bac Ninh. The inclusion of all provinces aimed to avoid bias while highlighting the overall spatial and temporal patterns of mining related influences on well-being. The longitudinal analysis formed the basis of Chapter 3: Mining, Development and Wellbeing in Vietnam: A Comparative Analysis.

2.3.1. Approach

To achieve Objective 1, the approach is largely based on two techniques: content analysis and longitudinal analysis. First, content analysis is a qualitative technique that provides insights into narrative and discourse (Krippendorff, 2004), and is largely used on newspapers and policy documents (Berg, 2001b). The technique is focused on identifying core themes within these texts through systematic analysis focussed on key words, issues, mining impacts, and policies.
Second, in simple terms, a longitudinal analysis was employed to interpret how key variables changed over time (Ruspini, 2003). One of the advantages of a longitudinal approach is that it allows for the identification of causal inferences (Menard and Menard, 2007).

2.3.2. Data collection

Information for content analysis was drawn from a variety of secondary sources and focused on the identification of core themes using systematic analysis (Berg, 2001b). Information was gathered from a number of secondary sources including webpages, newspapers, interest group comments, government documents, industrial reports, mining company reports and various works from international organisations such as the World Bank.

For a longitudinal analysis, data can be collected for any number of variables or types of quantitative information, but requires that the observation is a repeated measurement collected over two or more time points (Bijleveld et al., 1998). For Objective 1, census data was collected largely from the General Statistics Office (GSO) of Vietnam with an emphasis on the nation’s Statistical Year Books for the years 2009, 2010, 2014 (GSO, 2009, 2010d, 2014d). Information on income, poverty, employment, the Gini index and Indigenous populations were collated from national statistical accounts and supplemented with information from the Ministry of Agriculture and Rural Development (MARD, 2015) and the World Bank (2012). More detail of specific data sources used to address objective 1 are described in Chapter 3.

2.3.3. Analytic approach

In order to better understand the relationship between mining and socio-economic development at both the micro and macro levels in Vietnam, descriptive statistics and correlations (Pearson’s $r$) were used to provide a preliminary understanding of the relationship between indicators of
wellbeing and how these relationships have changed overtime. Next, a longitudinal panel study (Bijleveld et al., 1998) was used to investigate changes in three explanatory variables (poverty, income and unemployment) across 63 provinces for the five time points.

Generally one of three regression approaches are employed for longitudinal panel analysis including: standard linear pooling models (LPM), fixed effects models (FEM) and random effects models (REM) (Yves and Giovanni, 2008). Several statistical tests were used to identify the most appropriate technique including the Hausman test (1978) to select between FEM and REM, and an F-test to select between FEM or LPM (Gujarati and Porter, 2009). Through preliminary analysis it was determined that the fixed effects model (FEM) was the most appropriate which became the foundation of the longitudinal panel regression analysis used in this research (Torres-Reyna, 2010).

2.4. Objective 2: community perspectives of mining impacts on mining communities

Once an overall understanding of the impact of mining on Vietnam’s provinces was completed, the analysis focused on several case study locations to understand residents’ perceptions of how mining has impacted their communities. In particular, this analysis was focused on Phuoc Duc commune in the Phuoc Son district and the Tam Lanh commune in the Phu Ninh district, Quang Nam province. As described in the previous chapter, the principle for site selection was to examine the impacts of gold mining activities on the natural environment and socio-economic development of several communities. A review of literature indicated that numerous socio-economic and environmental issues had been associated with the Phuoc Son and Bong Mieu gold mines (e.g. Besra, 2013, 2014, Whitney, 2014). However, what was not well understood were the perceptions of local people concerning their impacts of these mines. These was an interesting and important line of inquiry, and provided the foundation of Objective 2.
2.4.1. Approach

To achieve Objective 2, a Q-methodology was employed. Q-methodology is a mixed method technique integrating both qualitative and quantitative methods to measure people’s subjectivities (Brown, 1980). Subjectivities are defined as a person’s viewpoints on a particular matter, such as health, water pollution or infrastructure development (Skinner, 1953). Indeed, understanding the extent to which people feel more or less strongly about a topic is difficult as perceptions are subjective, heterogeneous and diverse (Watts and Stenner, 2012). To overcome this challenge, Stephenson (1935, 1953) developed the Q-methodology which is a technique used to quantify these subjectivities at the individual and group level. Over the last decade or so, Q-methodology has experienced a re-emergence and is being used to examine public opinion, perceptions and attitudes, in psychology, sociology, human geography and mining studies (Chapman et al., 2015b, Weldegiorgis and Ali, 2016). To this end, Q-methodology was determined to be an appropriate approach for understand stakeholders’ attitudes regarding the impacts of mining operations on local communities.

2.4.2. Data collection

Drawing from previous research concerning the indicators of mining related development, 25 indicators were identified by Tonts et al. (2013a) to measure the impact of mining on development in African countries. Rather than developing a new set of indicators these measures were adopted for use in the Vietnamese context in order to provide comparability with similar research conducted in other developing nations (Appendix 4.1). Each of the 25 statements identified by Tonts et al. (2013) were translated into Vietnamese and formed the basis of the Q-sort analysis. Participants were selected using a snowball approach which will typically start with a village head then through a series of introductions, additional participants will be recruited according to their knowledge and experiences. Study participants (Q-sorters) were asked to place each statement within a quasi-normal distribution (Figure 2.4) ranked from
‘Most disagree’ to ‘Neutral/don’t know’ to ‘Most agree’. After sorting (a Q-sort), participants were asked why they ranked indicator as they had to provide further insight into their perceptions and beliefs. The Q-methodology is described further in Chapter 4.

<table>
<thead>
<tr>
<th>Most Disagree</th>
<th>Neutral/Don’t know</th>
<th>Most Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>-4</td>
<td>-3</td>
<td>+4</td>
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<tr>
<td>-3</td>
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<td>+3</td>
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<td>-2</td>
<td>-1</td>
<td>+2</td>
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<tr>
<td>-1</td>
<td>0</td>
<td>+1</td>
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<tr>
<td>0</td>
<td>+1</td>
<td>+2</td>
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<td>+1</td>
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</tr>
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<td>+4</td>
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<td>+3</td>
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</tbody>
</table>

Figure 2.4: Quasi-normal distribution used for Q-sort data collection

2.4.3. Analytic approach

Q-sort analysis employs a Principal Components Analysis (PCA) to draw out key themes (or components) from the quantitative data based on common sets of views or perceptions. In this case, the PCA helped identify patterns of similarity or difference in the subjectivities and lived experiences of the study participants. Typically, within a Q-sort analysis, three to five themes emerge which can be used to group respondents by shared viewpoints. This approach also allowed for the comparison of views from residents living in either mining or non-mining communities (Objective 3). Further details of this analytic approach are provided in Chapter 4.

2.5. Objective 3: differences in impacts - mining vs. non-mining communities

A comparison of the environmental and socio-economic impacts from mining was undertaken in order to understand the differences in perceptions between mining and non-mining communities (Freudenburg and Wilson, 2002, Kitula, 2006). Objective 3 was focused on determining the extent to which extractive activities in Quang Nam province had enhanced
wellbeing and brought benefit to the mining regions. A topic of continued debate, the positive impacts of mining has been challenged by numerous scholars (e.g. Banks and Ballard, 1997, Pegg, 2006). To better understand perceptions of these benefits (or lack of benefit) vary across mining and non-mining communities, two sets of comparisons were conducted: Phuoc Duc (mining commune) was compared with Phuoc Nang (non-mining commune); Tam Lanh (mining commune) was compared with Tam An (non-mining commune). Criteria for the selection of these communities was largely based on adjacency and/or homogeneity in demographic and socio-economic characteristics. This comparative case study was the basis of Chapter 5: Fool’s Gold: Understanding social, economic and environmental impacts from gold mining in Quang Nam province, Vietnam.

2.5.1. Approach

Objective 3 was primarily examined using deductive inquiry. The ‘top-down’ approach (theory=>hypothesis=>observation=>confirmation) sought to test the theory that mining is a driver of positive social and economic outcomes in mining communities (Hyde Kenneth, 2000). On the ground, the research employed an ethnographic approach, a field-based method used by social scientists to undertake systematic observations, engage in informal discussions, and conduct structured and semi-structured interviews among others (Kirsch, 2001). The approach is also used at the local institutional level to provide information concerning the success of development projects and capital works (Kirsch, 2001). Importantly, the ethnographic approach allows researchers to “examine various phenomena as perceived by participants and represent these observations as accounts” (Berg, 2001a, p.134).

2.5.2. Data collection

This portion of the study was marked by content analysis, and a series of interviews and field observations. Data collection focused on gaining a better understanding of local perceptions of
the environment, economy and society including poverty reduction, job generation, infrastructure development, health issues, drinking water, pollution and social upheaval. As such, primary data was gathered from the statistics offices of the Phuoc Son and Phu Ninh districts (PNS, PSS, 2015). Primary data was also collected from local government agencies at the commune, district and provincial levels including the People’s Committees; Department of Agriculture and Rural Development; Forest Protection Office; Departments of: Labour, Invalid and Social Affairs; Natural Resources and Environment, Infrastructure, Finance, Tax, Investment and Planning, Health and Education.

Next, interviews were conducted with local residents, government staff and mine employees using a semi-structured survey approach to collect a range of information concerning the role of mining in enhancing development and wellbeing in the region. This information was used to understand and compare advantages and disadvantages of mining and non-mining communities. Further details of data collected for Objective 3 is provided in Chapter 5.

2.5.3. Analytic approach

To achieve objective 3, data analysis was conducted through a comparison of mining and non-mining communities based on common themes such as job creation and infrastructure development. First, a comparison was made using statistical information to identify trends in, for example, poverty reduction over the past five to ten years. Next, interview results were compared to examine differences in perceptions around the themes described previously. Data from semi-structured interviews were used to support further insights concerning critical issues, and reinforce the results of any relevant quantitative analysis through triangulation. Triangulation was used to cross-check the reliable of the various information sources including
statistical accounts, interviews, and field observations and was an important step for enhancing the reliability and validity of the results (Ridder, 2017).

2.6. Objective 4: the role of regulatory frameworks in governing Vietnam’s mining sector

Finally, Objective 4 of this research sought to understand how Vietnam’s mining related regulations have influenced the impact of mining operations of local communities. Through an enhanced understand of the nation’s regulatory system and how mining regulations ‘play out’ on the ground at the local level. Over the past decade, although the central government has taken steps to reform the system regulating the sector weaknesses are evident including inconsistencies in regulatory authority, complicated and/or ambiguous laws and fragmentation of enforcement. In addition, Vietnam’s mining regulations have been charged as lacking the tools necessary to limit domination of State-owned enterprise, are pervasively corrupt, lack of transparency, and contribute to environmental degradation. These issues are explored in detail in Chapter 6: The regulatory framework and mineral development in Vietnam: An assessment of challenges and reform.

2.6.1. Approach

To address Objective 4, content analysis provided the analytic foundation for the inquiry into Vietnam’s system of mining regulations. Content analysis is “a research method that uses a set of procedures to make valid inferences from text” (Weber, 1990, p.9). From an analytic perspective content analysis allows for an objective and systematic approach for to generalise findings from a variety of secondary data sources (Prasad, 2008). Therefore, the use of content analysis to address research Objective 4 was appropriate for examining the multitude of policy documents comprising Vietnam’s regulatory framework.
2.6.2. Data collection

Data for this portion of the research was drawn from two primary sources. First, a literature review was conducted to identify what a modern mining regulatory code should look like and drew from previous research concerning mining policies and procedures used in other developing nations and guidance from a variety of international organisation. Examples of important literature included the following sources: the World Bank (1992, 1996), Onorato et al. (1998), Campbell (2010), Hilson (2014a), Besada and Martin (2015), Hilson et al. (2016), Ambe-Uva (2017). These literatures were used to define the essential elements of a modern mining code. This framework was then used a lens through which Vietnam’s situation was examined.

Next, key legal documents of the Vietnamese Government were collected such as the 2010 Mineral Law, and associated resolutions, decrees, decisions, circulars and approved provincial mining plans. These legal documents provide the foundation of Vietnam’s regulatory framework as enacted by the National Assembly, the Prime Minister, National Ministries and the Provincial People’s Committees.

2.6.3. Analytic approach

The principal analytic approach of the research conducted to address Objective 4 was a comparative analysis using the conceptual lens of a modern mining code developed through a review of relevant literature. This framework’s components comprised the essential elements of modern mining regulations. Specifically, this encompassed a legal framework, economic and fiscal policy, institutional reforms, corporate social responsibility and participation of local stakeholders. From a company perspective a modern mining code would account for important matters such as accessing to mining activities, investment contracts, environmental protection and social wellbeing. A comparison was then made to identify the extent to which Vietnamese
regulations adhere to the elements of a modern mining code. As a result, the strengths and weaknesses of the Vietnamese mining regulatory framework emerged which is discussed in detail in Chapter 6.

2.7. Conclusion

Grounded as an ‘anomalies’ case study, the research described within this thesis draws upon a mixed methods approach using both quantitative and qualitative analytic techniques including panel regression, Principal Component Analysis and content analysis. The data examined for this research was derived from a variety sources including academic literature, policy documents, statistical accounts, interviews and Q sorts. The results of these analyses are presented here after as a series of four publications. Triangulation of results using a combination quantitative and qualitative techniques adds to the accuracy and reliability of research findings. The result was deep insights into the themes explored in this thesis and confidence that each of the four research objectives set forth in the Introduction chapter have been met.

However, there are some limitations associated with each approach. According to Hsieh and Shannon (2005), findings from content analyses are limited by their attention to the broader meanings present in the data. Similarly, face to face semi-structured interviews can be influenced by the extent to which: 1) interviewers have structure questions to ensure that relevant information is captured; 2) the interviewer takes measures to understand the meaning of the interviewees message and to ensure that enough detail is captured; and 3) if interviews are recorded, that the interviewer also takes notes in case of tape recorder malfunctions (Opdenakker, 2006). Finally, the use of census data is not without potential problems as it may be, disadvantages are that the previous research may be unreliable, collected using low
standards, is not collected with the same methodology over multiple years and may be incomplete or not capture key variables (Jones, 2010).
Chapter 3: Mining, Development and Well-being in Vietnam: A Comparative Analysis

Prologue

This chapter was published as a peer-reviewed article in the journal *Extractive Industries and Society* (2017, https://doi.org/10.1016/j.exis.2017.05.009). It presented my efforts to collate a large amount of statistical information and examine the relationship between mining and development across Vietnam from 2009 to 2014. The chapter is intended to provide an overall picture of the mining and development in Vietnam, and forms the foundations for the next three chapters of the thesis. The hypothesis of this chapter was that the mining industry in Vietnam has played an important role in promoting socio-economic wellbeing across the nation, particularly in terms of poverty reduction, increases in income and job creation.

A quantitative approach was employed for this paper. A significant amount of time went into gathering and organising relevant statistical information and identifying appropriate tools for manipulating data and modelling statistical relationships. The General Statistics Office (GSO) office of Vietnam was a key source of data. In addition, data was obtained from the Ministry of Agriculture and Rural Development; the Ministry of Labour, Invalid and Social Affairs; and the World Bank. Three fixed-effects models were developed to examine the relationship between measures of wellbeing (poverty, income and unemployment) and influencing factors. Findings indicate that mining was one of the drivers of socio-economic wellbeing at the national level. Yet it was also clear that the role of mining in enhancing wellbeing at the provincial level is more nuanced.
Abstract

This paper examines how the mining sector in Vietnam has influenced socio-economic wellbeing across 63 provinces during the period, 2009-2014. Three fixed effects models were created to examine the relationship between measures of wellbeing (poverty, income and unemployment) and influencing factors. Findings indicate that mining is one of the drivers of socio-economic well-being at the national level however; the role of mining in enhancing wellbeing at the provincial level is more nuanced. Although mining is important for the nation’s economy, less is understood about how mining has influenced livelihoods in local communities. Therefore, in order to have a better understanding about the relationship between mining and socio-economic wellbeing at the local level, further research is required.
3.1. Introduction

Mining has played an important role in the economic development of many countries, particularly developing nations (Hilson, 2002b). Social implications of resource extraction have appealed to researchers interested in the impact of mining on development. Studies have revealed the complex relationship between mining and development including implications on economic growth, the politics of foreign direct investments (FDIs), creation of employment opportunities and reduction of poverty (e.g. Aryee, 2001, Campbell and Akabzaa, 2009, Knierzinger, 2014). In addition, much of the literature has concentrated on the negative impacts of resource extraction on the wellbeing of local peoples including political conflict, land loss, health impacts, single sector dependence, pollution, and social unrest (e.g. Das, 2001, Hilson, 2002a, Hatcher, 2012).

In Vietnam, like many other developing nations, mining has become an important component of the economy and has a long history. Copper, zinc, tin and gold have been mined since the Bronze age, and silver, iron and non-metallic minerals have been quarried since the 1\textsuperscript{st} century B.C by the Chinese (Kušnír, 2000); and during the French occupancy (1884-1945), extraction was further intensified. According to Blondel (1931), coal, gold, tin and zinc were mined, and exported to France with Japan later becoming a major recipient of mining outputs (Kušnír, 2000) during the second world war. After independence, the Vietnamese government have taken interest in expanding mining operations and are now issuing mining rights to foreign companies.

The Vietnamese Government has strongly supported the mining industry, with (more recently) the 2010 Mineral Law protecting unexploited minerals, regulated surveying, mineral exploration, mineral extraction, and mine management. A number of legislations have been
enacted to support the sector including the Political Bureau’s Resolution No. 02/NQ-TW, Resolution No.103/NQ-CP, decision No.2427/QD-TTg, and Directive No.02/CT-TTg. From a government perspective, these regulations have provided fundamental legal frameworks to manage and extract minerals effectively.

It has been posited that the mining industry has substantially contributed to the national and local economies in Vietnam, in regard to revenue, job creation and infrastructure development, particularly in rural provinces (Nguyen et al., 2015). However, mining has also been associated with social upheaval and environmental deterioration (Dung, 2011; Hai, 2014). In addition, the Vietnamese Government has been challenged with management of the mining sector including tensions between the mining companies and local communities. These difficulties have been acknowledged as principle constraints to mineral industry development and socio-economic improvement of the mining regions.

To date, there have been few studies examining the interaction between mining and sustainable regional development in Vietnam (Hoa, 2009b), particularly the resource curse (Vuong and Napier, 2014), resettlement (Vo and Brereton, 2014b), and the political implications of mining (Carlyle, 2009). Notably, research that has focused on mining in Vietnam has primarily been one-off case studies of single locations at a specific point in time resulting in a paucity of comparative analyses (e.g. Carlyle, 2009; Hoa, 2009b; Vo and Brereton, 2014a).

To this end, this paper aims to raise critical questions and examine how the mining sector in Vietnam has influenced socio-economic wellbeing across 63 provinces during the time period between 2009 and 2014 (based on available census data). To address this aim, the variability in socio-economic performances across these regions was first investigated. Next, the relationship between three response variables (poverty, income and unemployment) and
selected predictor variables were tested to further examine correlates of wellbeing. In the end, the study identifies fundamental gaps in knowledge concerning the relationship between mining, development, and wellbeing across Vietnam identifying further research needs.

The paper is organised as follows. First, a brief review of socio-economic wellbeing indicators is provided along with measurement approaches. Second, a literature review focusing on the interaction between mining, wellbeing and development in Vietnam is presented. Next, a comparison of poverty, income and unemployment measures for Vietnam is provided for the time period from 2009 to 2014. Finally, a fixed effects model was used to examine the relationship between measures of socio-economic wellbeing and selected predictor variables.

3.2. Indicators of socio-economic wellbeing: an overview

3.2.1. Socio-economic wellbeing

Wellbeing is multi-faceted, complex and difficult to define. According to Aristotle, *eudaimonia* in the first instance, refers to ‘human flourishing’ or ‘happiness’ (SEP, 2014). More recently (20th century), wellbeing has been associated with the provision for human needs, and the multi-dimensional factors that lead to poverty (Gough et al., 2007). Chambers (1997) interprets wellbeing as the quality of life, and the range of human experiences including social, psychological, spiritual and material. He states that wellbeing incorporates many elements such as living standards, access to basic services and good health, concepts mirrored by Stiglitz et al. (2009) who sees wellbeing as a multidimensional issue that includes dimensions of income, consumption, health, and education.

In the last decade, studies focusing on wellbeing in developing nations have been interested in understanding wellbeing within a development context. For instance, research on Wellbeing in Developing Countries (WeD) highlights that the concept can be interpreted as a combination
of “what a person has, what they can do with what they have and how they think about what they have and can do” (McGregor, 2007, p.4). Therefore, WeD has approached wellbeing from the context of ‘the material, the relational and the subjective’ (for example - housing, social interaction, and cultural values respectively) (White, 2009b).

Conceptually then, according to White (2009a), wellbeing can be categorised into material, social and human concerns, where wellbeing is examined through objective and subjective lenses, and from both individual and community perspectives (Table 3.2). Wellbeing then, is a function of income, health, education, culture and safety to name a few, and brings together principles of basic needs (e.g. BrayBooke, 1987), sustainable livelihoods (DFID, 1999) and the human index of development (UNDP, 1990). Therefore, White’s work has provided the foundation through which the wellbeing of developing nations is often examined.

Table 3.2: Dimensions of wellbeing.

<table>
<thead>
<tr>
<th>Dimensions of individual wellbeing</th>
<th>Dimensions of community wellbeing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Material concerns</strong> practical welfare and standard of living</td>
<td><strong>Social concerns</strong> relationships and access to public goods</td>
</tr>
<tr>
<td><strong>Objective aspects</strong></td>
<td><strong>Subjective aspects</strong></td>
</tr>
<tr>
<td>- Income, wealth and assets.</td>
<td>- Income levels, housing quality, tenure status.</td>
</tr>
<tr>
<td>- Employment and livelihood activities.</td>
<td>- Availability of information and communication.</td>
</tr>
<tr>
<td>- Levels of consumption.</td>
<td>- Availability/quality of services and amenities: water, sanitation, electricity, credits, shops, schools, colleges, hospitals, clinics, sport centres, places of worship, etc.</td>
</tr>
<tr>
<td></td>
<td>- Infrastructure and accessibility.</td>
</tr>
<tr>
<td></td>
<td>- Quality of environment.</td>
</tr>
<tr>
<td></td>
<td>- Satisfaction with income and wealth.</td>
</tr>
<tr>
<td></td>
<td>- Assessment of one’s standard of living compared with others.</td>
</tr>
<tr>
<td></td>
<td>- Assessment of present standard of living compared with the past.</td>
</tr>
<tr>
<td></td>
<td>- People’s satisfaction and perceptions of these.</td>
</tr>
<tr>
<td><strong>Social concerns</strong></td>
<td><strong>Objective aspects</strong></td>
</tr>
<tr>
<td>- Social, political and cultural identities.</td>
<td>- Community formation: groups, migration, conflicts.</td>
</tr>
<tr>
<td>- Violence, conflict and (in)security.</td>
<td>- Organisational belonging: churches, clubs, sports, etc.</td>
</tr>
<tr>
<td>- Relation with the State: law, politics, welfare.</td>
<td>- Informal association: where to get together.</td>
</tr>
<tr>
<td>- Access to service and amenities</td>
<td>- Community relations with State: law, politics, welfare.</td>
</tr>
<tr>
<td>- Networks of support and obligation.</td>
<td>- Violence, crime and (in)security.</td>
</tr>
</tbody>
</table>
### Subjective aspects

- Environmental resources.
- Perception of safety, respect and discrimination.
- (Dis)satisfaction with access to services.
- Assessment of treatment/support given
- Perception of environmental quality.

### Human concerns

- People’s satisfaction and perceptions of these.
- Experience of collection action.

### Objective aspects

- Household structure and composition.
- Education, information and skill.
- Physical health and (dis)ability.
- Relations of love and care.

### Subjective aspects

- Age distribution, health status, educational levels.
- Household composition/stability.

<table>
<thead>
<tr>
<th>Objective aspects</th>
<th>Human concerns</th>
<th>Subjective aspects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household structure and composition.</td>
<td>Age distribution, health status, educational levels.</td>
<td>(Dis)satisfaction with levels of health, information, skills, education.</td>
</tr>
<tr>
<td>Physical health and (dis)ability.</td>
<td></td>
<td>Sense of competence, (in)capacity and scope for influence.</td>
</tr>
<tr>
<td>Relations of love and care.</td>
<td></td>
<td>Trust and confidence.</td>
</tr>
</tbody>
</table>

( Modified from White (2009a))

### 3.2.2. Indicators and measurements of socio-economic wellbeing

Over the last few decades, numerous agencies have tried to use indicators of socio-economic well-being as measures of sustainable development at national, regional and local levels (Veleva et al., 2001, Hilson and Basu, 2003). This is because human wellbeing and sustainable development are closely associated as argued in the Brundtland report (WCED, 1987a). According to Veleva et al. (2001, p.448), indicators are conceptualised as “typically numerical measures that provide key information about a physical, social or economic system”. They go beyond simple statistics in an attempt to illustrate trends or cause-effect relationships and aim to raise awareness, inform decision-making and measure progress.

Over the last several decades, the Human Development Index (HDI), developed by the United Nation Development Program (UNDP, 1990) has influenced how we conceptualise measures of development. HDI is based on three key dimensions of human life including living...
standards, longevity, and knowledge; measured as GDP per capita, life expectancy and adult literacy respectively (UNDP, 1990). However, critics argue that alternative indices are needed to measures non-monetary factors and achievements in development (Bérenger and Verdier-Chouchane, 2007, Gough et al., 2007).

Fundamentally, the HDI was based on Sen’s (1987) conceptualisation of wellbeing however, there were a number of alternative attempts to quantify wellbeing which pre-date the work of the United Nation Development Program (Desai, 1991). For example, in 1976, ILO introduced the term ‘basic needs’ and in 1978, the World Bank began focusing on essential human needs such as food, shelter, education and healthcare. However, it wasn’t until 2000 that the United Nation began using the notion of ‘basic needs’ to measure wellbeing in the context of extreme poverty (UN, 2000).

3.3. Wellbeing, Development in the context of mining in Vietnam

As in many nations around the world, the mining industry in Vietnam has been viewed as a vehicle for enhancing socio-economic wellbeing. Based on Vietnam General Statistics Office (GSO) data (figure 3.5 and table 3.3), contribution from the mining industry to GDP has increased tenfold, from USD $2.13 million in 2000 to USD $20.58 million in 2013. Those employed in the mining sector have experienced increases in income from USD $70 per month in 2000 to USD $330 per month in 2013, and job creation in the sector has increased slightly from 255,000 in 2000 to 267,000 in 2013. At face value, it appears that the mining industry has had positive impacts on the country including reduction in rural poverty rates between 2000 and 2013. However, the extractive industry in Vietnam has been substantially affected by global commodity volatility.
Figure 3.5: Trends in mining contributions and socio-economic wellbeing from 2000-2013

Table 3.3: Explanation of variables in Figure 3.5

<table>
<thead>
<tr>
<th>Variables</th>
<th>Variable explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minerals (mil. USD)</td>
<td>Gross output of mining industry values</td>
</tr>
<tr>
<td>GDP (mil. USD)</td>
<td>Total contribution of mining and quarrying to GDP</td>
</tr>
<tr>
<td>Jobs (thousands)</td>
<td>Number of individuals 15 years old and above employed by mining</td>
</tr>
<tr>
<td>Income (USD)</td>
<td>Monthly average income of State enterprise employees in mining and quarrying</td>
</tr>
<tr>
<td>Poverty (%)</td>
<td>Poverty rate of household in rural areas</td>
</tr>
</tbody>
</table>

Sources: Vietnam General Statistic Office (200-2013)

For instance, alumina from mines in Tan Rai and Nhan Co were estimated to sell at USD $362 and USD $310 per ton, respectively (Hoa, 2009b). However, aluminium prices on the international market have dropped from USD $350 per ton in 2012 to USD $250 per ton in
2013 (Nappi, 2013). According to EJATLAS (2016), the project in Tan Rai alone produced 485,000 tons of alumina in 2014 and the investors may lose USD $48.5 million.

It could be argued that the Vietnamese economy has been affected by the resource curse (Vuong and Napier, 2014), or the notion that resource dependant countries fail to benefit fully from their natural endowments, and perform poorly when compared to the economies of non-resource dependant nations (Auty, 1993). One of the indicators of this phenomenon is that the economy becomes increasingly vulnerable due to debt from the international finance institutions and the lending countries. Notably, the total external debt of Vietnam has exponentially climbed in the last 10 years, from USD 18.65 billion in 2006 to USD 71.89 billion in 2014 (World Bank, 2016). According to the IMF (2014), public debt in Vietnam in 2014 accounted for 55.1% of GDP and approached an economically unsafe level. Critically, the debt has sharply risen to account for 58.3% of GDP in 2015 and is projected to account for 67.5% of GDP in 2021 (IMF, 2016a).

Another indication of the resource curse is high inflation. In Vietnam, inflation ranged between 23% in 2008 and 20% in 2011 (Pham and Riedel, 2012). In contrast, the inflation rates of 140 countries which are classified as emerging markets and developing economies around the world in 2008 and 2011 were 10.3% and 5.4%, respectively (IMF, 2016b). As a result, the IMF (2009) reduced its estimates of growth in Vietnam in 2009 to 4.75% even though the government targeted growth of 6.5% with historic growth averaging 7.5% for the nation. Moreover, the high inflation rate was realised as one of the main drivers for closures or insolvency accounting for approximately 15-25% of the approximately 100,000 enterprises in Vietnam during this period (Vuong, 2012). Consequently, socio-economic development was adversely affected in regard to unemployment, bank debts and so on.
3.4. Study area and variable identification

3.4.1. Study area

Vietnam possesses a variety of minerals according to the Department of Geology and Minerals (DGMV). There are approximately 5,000 ore occurrences across the country representing 70 different commodity types including coal, bauxite, gold, tin, zinc, copper, titanium and manganese. Coal deposits are found mainly in the Quang Ninh area whilst ores deposit are found in the mountainous northwest provinces. In addition, bauxite is found in high volume deposits in the Central Highlands, whilst gold deposits are found in the central portion of the country.

This research focused on the 63 provinces of Vietnam. These included the cities of Ha Noi, Da Nang and Ho Chi Minh which exhibit high population densities. In addition, this study includes several provinces with industrial development including Binh Duong, Dong Nai, and Bac Ninh.

3.4.2. Variable identification

The selection of wellbeing measures relevant to Vietnam was driven by a comparative analysis of socio-economic wellbeing literature. Theory provides insight into the important factors of wellbeing however, data availability often influences pragmatism. Based on scholarly works, theoretical constructs of socio-economic wellbeing, focus on poverty, income and unemployment, and according to the World Bank (2005), poverty is the key determinant of wellbeing. This relates most closely to what Sen (1993) would describe as ‘capability’ where poverty and wellbeing are strongly associated.

In turn, Easterlin (1973), (1995) highlighted that income plays a critical role in wellbeing, the importance of which was dually noted in the HDI, where income is one of the three primary indicators of human development (UNDP, 1990). Consequently, a number of scholars have
identified that unemployment is strongly correlated with low levels of mental wellbeing (Warr et al., 1988, Clark and Oswald, 1994, Tella et al., 2001). As White and Ellison (2007), (2009b) identified, there are three key components of socio-economic wellbeing - material, social and human concerns. Grounded in conceptual notions of wellbeing and previous attempts to measure the concept, this research focuses on indicators of poverty, income and unemployment to examine trends in socio-economic wellbeing across space and time. A summary relationship between response variables (poverty, income and unemployment) with explanatory variables are provided in Table 3.4

Based on research on wellbeing in developing countries and White’s (2009a) framework, the selection of explanatory variables were largely based on the three dimensions of wellbeing: material, social and human concerns. In addition, each dimension was further subdivided into a set of potential determinant of socio-economic wellbeing. ‘Material concerns’ incorporates income, wealth and assets as well as employment and livelihoods. ‘Social concern’ include environmental resources as well as social, political and cultural identities. ‘Human concern’ include education. Driven by data availability, and tests for multicollinearity, 12 explanatory variables were selected to test as correlates of socio-economic wellbeing in Vietnam (measured against poverty, income and unemployment).

Explanatory variables were selected to represent the three dimensions of wellbeing and its subgroups discussed previously (material, social and human concerns). In the first instance, provincial budget revenue, industry concentration (measured as agricultural and mining LQ), and productivity were selected as correlates of wellbeing in rural Vietnamese mining provinces. For instance, ILO (2011) identified that there was a negative association between state budget revenue and unemployment. Similarly, a number of scholars have shown that the values of mining and agriculture production plays a critical roles in socio-economic wellbeing
particularly in regard to income generation and poverty reduction (Belem, 2009, Campbell, 2009, Tuyen, 2015).

In addition, the location quotients (LQ) for mining and agriculture measure the concentration of these industries in each province. The LQ is defined as the ratio between R1/R2, where R1 and R2 are proportions of local and national employment in a particular industry, respectively. Conventionally, it provides a measure of local economic specialisation. For example, research of Stimson et al. (2002) indicated that a LQ can measure the degree to which a local economy depends on mining activities. An LQ greater than 1 indicates over-representation of a particular industry at the local level (Miller et al., 1991, Stimson, 2006, Chapman et al., 2015a). In this study, LQ’s for mining and agriculture are employed to measure the degree to which rural provinces’ economies rely on mining and agricultural activities.

Finally, previous studies have indicated that growth in productivity is a fundamental source of income generation, particularly in agriculture and mining (Pegg, 2006, Saigenji and Zeller, 2009, de Janvry and Sadoulet, 2010). According to de Ferranti et al. (2002), natural resource-based production such as extraction and agriculture were realised as knowledge industries because these operations relate to growth in productivity, technical spillovers as well as forward and backward linkages. The logic described as: mining and agricultural activities -> technological improvement -> productivity increase -> economic opportunity expansion -> income increase -> poverty reduction (Pegg, 2006, de Janvry and Sadoulet, 2010). Therefore, the study employed productivity in mining and agriculture as a correlate of income and poverty.

Research has also revealed that access to agricultural land in Vietnam has been closely associated with income and unemployment. Particular in mountainous and rural regions, where most of the poor’s livelihoods depend on the agricultural sector (Ravallion and van de Walle,
2008, Tuyen, 2014, 2015). In addition, the effect of poverty-increasing landlessness exacerbated long-term poverty in Vietnam. For example, a study by ActionAid in the Son La province indicated that a greater concentration of land ownership drove a larger gap between the wealthy and poor in rural regions due to emergence of landlessness (Smith and Binh, 1994).

Migration is an important factor in determining socio-economic wellbeing. In the Vietnamese context, migration of rural workers has risen exponentially in the last ten years which has been acknowledged as a powerful force for growth, and a decline in inequality and poverty (UN, 2010). A migration survey conducted in 2009, indicated that an annual growth in rural-urban migration and rural-rural migration was 9.2 % and 11.2%, respectively (GSO, 2011a). This survey also found that migration made positive contributions to migrants in terms of jobs, income and living standard. For this reason, it is crucial to include migration as an explanatory variable in the research.

Human concerns were examined using measures of educational attainment including illiteracy levels, and high school and university attendance. A number of authors have espoused the relationship between education attainment and socio-economic wellbeing, particularly in rural and remote regions (ANM, 2009, White, 2009b).

Poverty was measured based on monthly or annual income as defined by the Vietnamese Prime Minister for each time point. For instance, decision No 170/2005/QĐ-TTg applied in 2006 and 2010, classified families as ‘poor’ if their income was less than VND 200,000 and VND 260,000 per person per month, respectively. Decision No 09/2011/QĐ-TTg applied in 2011 and 2015, classified families as ‘poor’ if their income was less than VND 400,000 and VND 500,000 per person per month, respectively. Unemployment was defined as those aged 15 years or older willing to work but without employment.

Table 3.4: Explanatory variables of socio-economic wellbeing and expected relationship with response variables.

<table>
<thead>
<tr>
<th>Dimensions of socio-economic wellbeing (WeD)</th>
<th>Selected variables depends on WeD</th>
<th>Expected relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key issues</td>
<td>Subgroup</td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Income, wealth and assets</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mining value</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Agricultural value</td>
<td></td>
</tr>
<tr>
<td>Employment and livelihoods</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LQ in agriculture</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mining productivity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Agricultural productivity</td>
<td></td>
</tr>
<tr>
<td>Social</td>
<td>Environmental resources</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Social, political and cultural identities</td>
<td></td>
</tr>
<tr>
<td>Human</td>
<td>Education</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Higher secondary net attendance rate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>University net attendance rate</td>
<td></td>
</tr>
</tbody>
</table>

3.5. Empirical results

3.5.1. Correlations between poverty, income, unemployment.
To measure the degree of interaction between each response variable, Pearson correlations were calculated. This step provided insight into the relationships between indicators of wellbeing and how these relationships have changed over time.

The relationship between the three response variables are provided in Table 3.5. First, correlations between poverty and income showed a negative relationship in 2014 ($r=-0.77$, $p=0.00$). Similarly, there was a negative relationship between poverty and unemployment in both 2009 ($r=-0.48$, $p=0.00$) and 2014 ($r=-0.45$, $p=0.00$). Correlations between income and unemployment was negative ($p=-0.52$, $r=0.00$) in 2009, and all variables were significant at the 0.05 level of confidence based on p-values.

**Table 3.5: The significant correlations (p-value <0.05) among response variables in 2009 and 2014**

<table>
<thead>
<tr>
<th></th>
<th>Poverty</th>
<th>Income</th>
<th>Unemployment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poverty</td>
<td>1</td>
<td>1</td>
<td>-0.77</td>
</tr>
<tr>
<td>Income</td>
<td>-0.77</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Unemployment</td>
<td>-0.48</td>
<td>-0.45</td>
<td>-0.52</td>
</tr>
</tbody>
</table>

**3.5.2. Descriptive statistics**

A summary of descriptive statistics for the three response variables (poverty, income and unemployment) are provided in Table 3.6 and Figure 3.6. Importantly, the findings indicated that there was significant differences in poverty levels, (p-value <0.05) between 2009 and 2014, but not in income and unemployment levels.

Overall, there was a reduction in poverty levels between 2009 and 2014 as measured by the median, mean and range (max-min) in percent of people classified as poor in 63 provinces across Vietnam. Given this, the median is better than the mean in terms of measuring central
tendency as the median is not affected by outliers or extreme values. The median percent poverty in 2009 was 14.62% and decreased to 9.6% in 2014, the range in percent poverty was 51.6% in 2009 and decreased to 35.29% in 2014. Similarly, the standard deviation of 2009 and 2014 were 11.09% and 8.03%, respectively. This indicates that the variance or dispersion of the poverty rate in 2009 was greater than in 2014.

Similarly, income for the 63 provinces decreased during the five year period between 2009 and 2014. The median percent income in 2009 was VND 2476.1 which decreased to VND 2173.5 in 2014, and the range (max-min) in income was 3330.9 VND in 2009 and increased to VND 4829 in 2014. Similarly, the standard deviation in median income in 2009 and 2014 was VND 468.57 and VND 838.98 respectively. These results indicate that the variability in poverty increased between the two time points and may illustrate an increase in the level of inequity found in provinces across Vietnam.

Median unemployment had slightly declined from 2.1% in 2009 to 1.71% in 2014, but variation in unemployment across the 63 provinces increased slightly. In 2009, the range (max-min) of unemployment was 10.22% whilst in 2014 the range was slightly higher at 10.86%. In addition, the SD of median unemployment was 1.41% in 2009 and 1.53% in 2014. This indicates that variance or dispersion in unemployment rates in 2014 was higher than that in 2009.

Table 3.6: Descriptive statistic of three response variables in 2009 and 2014.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>Median</th>
<th>Min</th>
<th>Max</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poverty</td>
<td>17.40</td>
<td>11.02</td>
<td>11.09</td>
<td>8.03</td>
<td>14.62</td>
<td>9.60</td>
<td>0.30</td>
</tr>
<tr>
<td>Income</td>
<td>2468.36</td>
<td>2231.98</td>
<td>468.57</td>
<td>838.98</td>
<td>2476.1</td>
<td>2173.50</td>
<td>10.00</td>
</tr>
<tr>
<td>Unemployment</td>
<td>2.36</td>
<td>1.89</td>
<td>1.41</td>
<td>1.53</td>
<td>2.10</td>
<td>1.71</td>
<td>0.78</td>
</tr>
</tbody>
</table>
Figure 3.6: Box plots of median, range, and disparity of poverty, income and unemployment between 2009 and 2014. There were statistically significant differences between 2009 and 2014 for poverty variable based on t-tests

3.5.3. Model specification

To measure variability in wellbeing and the explanatory variables (poverty, income and unemployment) across 63 Vietnamese provinces for 2009 and 2014, panel model was deemed most appropriate (Wooldridge, 2013, Yves and Giovanni, 2008). According to Yves and Giovanni (2008), depending on parameter homogeneity and sample heterogeneity (Vietnamese provinces in our case), a standard linear pooling model (LPM), fixed effects model (FEM) or random effects model (REM) should be employed.

To select the most appropriate modelling approach, FEM or REM, a Hausman test (1978) was used. P-values for the three models (poverty, income and unemployment) were less than 0.05 and according to Greene (2002), these findings suggested that FEM is the better choice. Next, to select between FEM or LPM, an F-test was used to measure the overall significance of the estimated regression model (Gujarati and Porter, 2009). Results from the F-test (see Croissant
et al. (2016), where p-values for the three models (poverty, income and unemployment) were less than 0.05, suggests that FEM is an appropriate choice (Torres-Reyna, 2010).

According to Wooldridge (2013), the FEM is defined as below:

\[
y_{it} = \beta_0 + \delta_0 d_{2t} + \beta_1 x_{it} + a_i + u_{it} \tag{1}
\]

where \( y \) is the response variable, \( x \) is a predictor variable(s), \( i \) denotes the longitudinal provinces (\( i=1….63 \)), \( t \) denotes the time period (\( t=1 \) corresponds to 2009 and \( t=2 \) corresponds to 2014), \( d_{2t} \) is a dummy variable (for mining province \( d_{2t}=1 \) and for non-mining province \( d_{2t}=0 \)). Therefore, the intercept for \( d_{2t}=0 \) is \( \beta_0 \) and the intercept for \( d_{2t}=1 \) is \( \beta_0 + \delta_0 \).

\( \beta_1 \) is the vector of coefficients, \( a_i \) is an unobserved effect or fixed effect, \( a_i \) is fixed overtime and captures all unobserved variance, time-constant factors that affect \( y_{it} \). \( u_{it} \) are idiosyncratic errors or time-varying errors which represents unobserved factors that changed over time and affect \( y_{it} \) (Wooldridge, 2013).

Table 3.7: Summaries the general model specification for each measure of socio-economic wellbeing.

<table>
<thead>
<tr>
<th>Explanatory variables</th>
<th>Model 1: Poverty</th>
<th>Model 2: Income</th>
<th>Model 3: Unemployment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef</td>
<td>p-value</td>
<td>Coef</td>
</tr>
<tr>
<td>Dummy variable(s)</td>
<td>-569.66</td>
<td>0.046*</td>
<td>-104.71</td>
</tr>
<tr>
<td>Agricultural land</td>
<td>-0.61</td>
<td>0.01*</td>
<td>-104.71</td>
</tr>
<tr>
<td>University attendance</td>
<td>-0.24</td>
<td>0.04*</td>
<td></td>
</tr>
<tr>
<td>LQ mining</td>
<td>0.36</td>
<td>0.00***</td>
<td>0.4356</td>
</tr>
<tr>
<td>LQ agriculture</td>
<td>0.36</td>
<td>0.00***</td>
<td>0.4356</td>
</tr>
<tr>
<td>Mining value</td>
<td>0.01</td>
<td>0.046*</td>
<td></td>
</tr>
<tr>
<td>Agricultural value</td>
<td>0.006</td>
<td>0.02*</td>
<td>0.0009</td>
</tr>
<tr>
<td>Mining productivity</td>
<td>0.0021</td>
<td>0.02*</td>
<td>-0.000002</td>
</tr>
<tr>
<td>Agricultural productivity</td>
<td>0.0560</td>
<td>0.00***</td>
<td>0.5316</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.7494</td>
<td></td>
<td>0.5369</td>
</tr>
<tr>
<td>F-statistic</td>
<td>20.56</td>
<td>0.00***</td>
<td>6.96</td>
</tr>
<tr>
<td>Observations (N)</td>
<td>N=126, time (T) =2</td>
<td>N=126, time (T) =2</td>
<td>N=126, time (T) =2</td>
</tr>
<tr>
<td>An Giang</td>
<td>55.63</td>
<td>0.00 **</td>
<td>9744.22</td>
</tr>
<tr>
<td>Bac Giang</td>
<td>30.63</td>
<td>0.00 ***</td>
<td>4670.13</td>
</tr>
<tr>
<td>Bac Kan</td>
<td>27.81</td>
<td>0.00 ***</td>
<td></td>
</tr>
<tr>
<td>Province</td>
<td>Distance</td>
<td>Population</td>
<td>Economical</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------</td>
<td>------------</td>
<td>------------</td>
</tr>
<tr>
<td>Bac Lieu</td>
<td>28.57</td>
<td>5223.08</td>
<td>2.74</td>
</tr>
<tr>
<td>Bac Ninh</td>
<td>39.94</td>
<td>7753.45</td>
<td>2.21</td>
</tr>
<tr>
<td>Ben Tre</td>
<td>41.82</td>
<td>7464.99</td>
<td>1.63</td>
</tr>
<tr>
<td>Binh Dinh</td>
<td>25.01</td>
<td>3851.67</td>
<td>2.89</td>
</tr>
<tr>
<td>Binh Duong</td>
<td>45.19</td>
<td>11109.23</td>
<td>2.05</td>
</tr>
<tr>
<td>Binh Phuoc</td>
<td>45.81</td>
<td>9009.53</td>
<td>2.13</td>
</tr>
<tr>
<td>Binh Thuận</td>
<td>29.09</td>
<td>5668.47</td>
<td>3.93</td>
</tr>
<tr>
<td>Bạc Ria-VT</td>
<td>35.49</td>
<td>7993.07</td>
<td>3.26</td>
</tr>
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3.5.4. Model 1: Poverty

Model 1 provides an indication of suitable explanatory variables relevant to the measure of poverty in Vietnam’s 63 provinces (Table 3.7). This Model accounts for 74.94% of variance in the rate of poverty (F=20.56, p=0.00) with five variables identified as significant predictors of poverty with at least a 95% level of confidence. The LQ for mining illustrates the greatest positive influence on poverty (β=0.36, p=0.00) followed by the value of mining (β=0.01, p=0.046), and agricultural value (β=0.006, p=0.02). Both agricultural land (β=-0.61, p=0.01) and university attendance (β =-0.24, p=0.04) resulted in a negative relationship with respect to poverty. In addition, all provinces except Quang Ninh were significant predictors of poverty with at least a 95% level of confidence.

Model 1 identifies variables that account for variability in poverty across the 5 year study period. The Model indicated that human capital played a key role to reducing poverty. For example, university attendance was negatively associated with the poverty rate. This is consistent with recent research in Vietnam identifying that high levels of poverty are found in rural and upland areas where low educational attainment is positively related to poverty (World Bank, 2012). In these areas, Indigenous people are most vulnerable as they exhibit some of the lowest levels of educational attainment and the highest poverty rates (World Bank, 2009).
2010, rural Vietnamese accounted for more than 92% of persons living below the poverty rate, of which ethnic minorities accounted for more than 68% of those classified as extremely poor (World Bank, 2012). The World Bank (2009) also identified that 23% of heads of Indigenous households were illiterate and accounted for approximately 40% of those living below the poverty line (World Bank, 2009).

Findings also indicate that the agricultural value in the poverty Model was positively associated with poverty. This is consistent with others who have found that those areas with a high concentration of agricultural activities are also associated with high levels of poverty (Tollens, 2002, Rigg, 2005). According to the World Bank (2012), farmers comprise the largest proportion of the poor in Vietnam. In 2010, for example, approximately 40% of agricultural households were identified as living below the poverty line which was three time higher than the average nationally (World Bank, 2012).

Notably, the LQs for mining and mining value were both positively associated with poverty. This indicates that these variables do not necessarily negatively influence poverty. This is consistent with a recent study in Ghana, a mineral-rich country, which showed that labour employment in the mining sector was negatively correlated with mineral output, export values and the number of mines. In addition, poverty was acutely pervasive in the country, especially in mining communities (Akabzaa, 2009a). This is similar to what Campbell (2009) found in Guinea, a country accounting for 40% of the world’s bauxite, where mining employed approximately 8% of the active population and accounted for 92.3% of total exports in 2004. However, poverty was widespread in Guinea and the country was ranked 160th out of 177 by the Human Development Index from 2002 to 2005.
Agricultural land in the Model was also negatively associated with poverty. A population census in 2014 indicated that approximately 67% of the Vietnamese population lived in rural areas therefore agricultural land was important for sustaining livelihoods (GSO, 2014c). According to the World Bank (2003b, 2012), landlessness was acknowledged as one of the main cause for poverty and the positive relationship between landlessness and poverty was clear in Vietnam. Similarly, research by Nguyen (2008) showed that agricultural land contributed to poverty reduction. Specifically, agricultural land resulted in a 4.5% reduction in poverty for land holders (Nguyen, 2008).

3.5.5. Model 2: Income

Model 2 provides an indication of suitably explanatory variables relevant to the measure of income in Vietnam’s 63 provinces (Table 3.7). This Model accounted for 53.70% of the variance in monthly income (F=6.96, p=0.00). Four independent variables were significant predictors of income with at least 95% confidence. Agricultural land (β=-104.71, p=0.00) illustrates the greatest influence on income however, this relationship was negative. Positive relationships between the LQ for mining (β=26.45, p=0.048), LQ for agriculture (β=2.88, p=0.02), and mining productivity (β=0.0021, p=0.02) with monthly income were also observed. In addition, all provinces except Bac Kan and Quang Ninh were significant predictors of income with at least a 95% level of confidence.

Notably, in the Model 2, the dummy variable was significant and negatively associated with monthly income (δ=-569.66, p=0.046). Model 2 identifies variables that account for variability in monthly income across the 5 year study period. The LQ for agriculture in Model 2 was also positively associated with monthly income. In the rural regions of Vietnam, labour accounted for 69.3% of the total labour of the country so that income from agricultural activities were crucial for rural labour (GSO, 2015b). Recent studies have indicated that in the poorest regions
of Vietnam, for instance, the majority of rural poor relies largely on agricultural practices for income (Tuyen, 2015). Similarly, the World Bank (2012) showed that approximately fifty percent of poor households’ income came from agricultural activities. Research in 68 developing countries also indicated that increasing agriculture labour, particular women, raised agricultural value per worker (Dao, 2009).

Agricultural land in this Model was also negatively associated with monthly income. One explanation for this is that in order to increase yield, fertilisers, pesticides and herbicides are intensively used (Van Keulen, 2007). As a result, soil and land have been degraded resulting in decreasing overall yields (Verhagen et al., 2007). For example, in Vietnam expenditures for fertilisers and pesticides accounted for 25%-30% of total on-farm cost and the net return has been inadequate, approximately 20-30% (Hai, 2012). Indeed, the Vietnamese farmers are trapped in a cycle of ever-increasing chemical inputs with lower productivity and profitability (Kuiper et al., 2007).

The LQ for mining in the Model was positively associated with monthly income. This is consistent with a recent study in Sub-Saharan Africa, a mineral-rich country, which showed that income from mining, particularly artisanal and small-scale mining, has become the key income-earning activity (or important supplementary income) for rural families over the last three decades (Hilson, 2016). According to Weber-Fahr et al. (2001), approximately 80-100 million people around the world rely on income from small-scale mining activities.

Mining productivity in the Model 2 was positively associated with income. This indicates that rising productivity in mining has an influence on increased incomes. Research by Rolecíková et al. (2014) in the Czech Republic indicated that increasing coal production drove a rise in average salary. Similarly, this is also associated with the status quo of the mining exploitation
in Vietnam. According to the Coal-Mineral Industries Holding Corporation Ltd (Vinacomin) in 2013, for example, rising productivity was important for improving competitiveness on the worldwide market. Therefore, all affiliated companies of Vinacomin have tried to increase productivity. One of the approaches applied was to give each affiliated company a salary package that included stock options. After implementation of productivity enhancing measures, waste in coal production was reduced from 40%-50% to 27%-31% and the salary of employees increased as a result (Vinacomin, 2013).

3.5.6. Model 3: Unemployment

Model 3 provides an indication of suitable explanatory variables relevant to the measure of unemployment in Vietnam’s 63 provinces (Table 3.7). The Model accounts for 53.16% of the variance in unemployment, significant with 95% confidence (F=13.17, p=0.00). All independent variables are significant predictors of unemployment with at least 95% confidence. Agricultural productivity (β=0.0012, p=0.00) had the greatest influence on the unemployment rate, followed by agricultural value (β=0.0009, p=0.02) and mining productivity (β=-0.000002, p=0.00). All relationships were positive except for mining productivity. In addition, all provinces except Dak Nong, Ha Giang and Son La were significant predictors of unemployment with at least a 95% level of confidence.

Model 3 identifies variables that account for variability in the rate of unemployment across the 5 year study period. In the Model, agricultural production value and agricultural productivity were positively associated with the unemployment rate. In Vietnam, technological improvement has reduce labour in the agricultural sector whilst Vietnam’s economy is largely based on agriculture production. Employment in the sector in 2010 accounted for approximately 50% of the total labour force (GSO, 2010a). However, according to the World Bank (2007), due to increased efficiency and population growth, farm size has decreased whilst
outputs have increased. As a result, jobs in the agricultural sector have been lost. According to Dang et al. (2006), employment in the agricultural sector declined from 70.1% to 61.9% between 1995 and 2004. More recently, agricultural employment fell from 50% in 2010 to 46% in 2014 (GSO, 2010c, 2014b).

Mining productivity was negatively associated with unemployment. This indicates that increases in the productivity of mines may also result in increased employment. Weber-Fahr (2002), Pegg (2006) have shown that in some cases resource extraction has been associated with technological development and increased employment is a result of collective learning. In Australia, it has been posited that increased use of technology in mining was unlikely to result in a reduction of jobs as new roles are likely to emerge (McNab et al., 2013).

In Vietnam, increasing mining productivity was unlikely to reduce the labour force in the mining industry. Three forces may be at work here. First, a decrease in employment in the agricultural sector from 50% in 2010 to 46% in 2014 (GSO, 2014c) may have been driven by a rise in the number of people working in the mining industry. Second, due resource volatility, extractive companies may increase production capacity to offset revenue loss resulting in employment growth. In addition, training and the resulting spillover effect may increase employment opportunities (Weber-Fahr et al., 2001).

Statistics indicated that employment in the mining sector was significantly higher in mining regions. For example, in the period from 2002 to 2010, employment in the mining industry accounted for an average of 0.75% of total employment at the national level (GSO, 2010c). However, in the same period, an average only 2% of the population worked in mining sector in the north-eastern portion of the country (GSO, 2010c).
3.6. Discussion

The finding presented in Model 1 indicates that education (measured by university attendance) is an important factor for reducing poverty in Vietnam over the period from 2009 to 2014. It was acknowledged that in being knowledgeable and skilful, university graduates contributed substantially to poverty reduction and income improvement. In this aspect, contributions of university graduates to socio-economic wellbeing were important. Therefore, human capital is likely a salient factor in improving wellbeing which is consistent with research on mining (e.g. Freudenburg, 1992, Tonts et al., 2012) and wellbeing in developing nations (WeD) (e.g. White and Ellison, 2007, White, 2009a).

The results also indicate that agriculture was one of the most crucial determinants of socio-economic wellbeing in the period 2009-2014. According to the GSO (2014b), approximately 70% of the labour force worked in agriculture in rural regions. Moreover, the World Bank (2012) showed that livelihoods of the majority of people living in rural regions is closely linked to agriculture. Therefore, as the World Bank (2012) has identified, agriculture will continue to be a critical income source for millions of people in Vietnam. This especially applies to Ethnic Minorities for whom 75% of their total income is earned from agriculture and related activities.

Notably, the LQ for agriculture was positively associated with income in Model 2. However, this increase was small as a one unit increase in the LQ for agriculture resulted in an increase in VND 2.88. Research has shown that those employed in the agricultural sector are likely to be poorer due to low wages compared with non-farming households (GSO, 2010c). A similar result was also found by the World Bank (2012) where farmers, particularly the Indigenous, were categorised as living below the poverty rate in Vietnam. In 2010, for instance, agricultural families and ethnic minorities accounted for 65% and 47% of the nation’s poor respectfully.
Importantly, the World Bank (2012) highlighted that income from agriculture, for instance, accounted for approximately 60% of the total income of extremely poor families whilst only 15% of the total income for the richest group in rural areas was acquired through agricultural endeavours.

Results also indicate that mining activity in general, is related to increased socio-economic wellbeing across provinces, particularly income and unemployment. Mining productivity and the LQ for mining was associated with an increase in income whilst mining productivity contributed to a decline in unemployment. However, these relationships were small. Findings indicate that when increasing one unit in mining productivity, for instance, income increases by only VND 0.0021 and unemployment decreases only 0.000002% (Table 3.7). These results mirror this by Tran et al. (2012) who found that across five different mining sites in Vietnam only 25 jobs were created for local community members (0.78% of the local population) and average monthly income was only VND 2.83 million.

In contrast, the LQ for mining and value of mining in Model 1 were positively associated with poverty. This is consistent with the real situation in Vietnam’s mining sector. For instance, Tan Rai bauxite-alumina complex in Dak Nong province, whose bauxite deposits comprise 62% of Vietnam’s total reserve and 20% of the world’s, produced 600,000 tons of alumina by 2010 and 1.2 million tons per year afterward (Morris, 2013). However, according to Dak Nong’s General Statistics Office (DNGSO, 2016), from 2010 to 2015, minerals accounted for only 0.76% of the province’s total revenue.

This positive correlation between the LQ for mining and the value of mining with poverty were also consistent with other research from Vietnam. A study by the World Bank (2012) found that the highest poverty rate in the country in 2010 (72%) was in the north-western mountain
provinces where the majority of mineral extraction has occurred. The Lao Cai province, for instance, has more than 150 mines with 30 different types of minerals. However, it is one of the poorest regions with an Indigenous poverty rate of approximately 70% (as of 2008). Based on a report by the Ministry of Planning and Investment in 2009, the average annual income in 2007 for residents of the Lao Cai province was USD 549 per person, or 47% of the nation average (MPI, 2009).

This is consistent with research in Ghana where income in mining regions was found to be lower than non-mining regions (Akabzaa, 2009a). For example, Wassa West district in Ghana, which produced the majority of gold exported from the country, had lower income and higher poverty rates than other regions. In addition, the Gini coefficient for Wassa West was 0.408 and the national Gini coefficient was 0.327 (Akabzaa, 2009a).

At a macro level, mining may create capacity through innovation and/or knowledge growth over the long-term. Enhanced capacity can permeate to other sectors and contribute to sustained economic growth and poverty reduction (Weber-Fahr, 2002). Extractive operations may increase capacity of the poor who live adjacent to mining locations through increased employment opportunities, training and the resulting spillover effect (Weber-Fahr et al., 2001). Research on copper mining in Zambia, for instance, indicated that the average living standard of communities surrounding the mines improved with an increase in local copper production, particularly for those involved in service sector employment (Lippert, 2014).

One of the critical issue that has substantially affected socio-economic wellbeing is inequality. Statistics have showed that income inequality distribution (Gini index) has risen from 0.424 in 2006 to 0.430 in 2014 (GSO, 2014c). Research in Vietnam has also indicated that inequality has been positively associated with poverty especially in mountainous regions where the
majority of the nation’s Indigenous live (World Bank, 2012). For example, in 2009, the Gini index of the Northern mountainous region was 0.345 whilst the Gini index for the Red River Delta was substantially lower, 0.298 (GSO, 2010c). According to GSO (2009), (2014c), a disparity between the highest and lowest income groups in the Northern midlands and mountainous regions has risen from 4.4 in 2009 to 8.1 times in 2014. Indeed, ethnic minorities are disadvantaged in lower levels of access to education, and employment (World Bank, 2009). Therefore, the gap in inequality between ethnic minorities and low land groups has been widened as a result.

In conclusion, uneven distribution of mining benefits to Indigenous communities is a common result of resource extraction activities (Kumah, 2006). This is consistent with findings from across South-East Asian where ethnic minorities in particular, have substantially suffered from mining production (Xanthaki, 2003). Indeed, enhancing wellbeing in the most affected communities is a challenge for the industry however, it is unlikely that mining companies will relinquish a greater share of profits unless forced to do so (Doyle et al., 2015). Until mining companies and governments at all levels are willing to address inequalities resulting from resource extraction activities, the wellbeing of mining communities will persist at low levels even though the industry often espouses otherwise.

3.7. Conclusion

Overall, the three Models provide a dynamic picture of the temporal and spatial variability of socio-economic wellbeing from 2009 to 2014. Findings indicate that at national level, mining was one of the drivers of socio-economic well-being, but has had a modest impact. Across 63 provinces, results indicate that mining may not drive poverty reduction, and in particular was found to have little influence on income generation and decreased unemployment. Although mining is important for the nation’s economy, less is understood about how mining has
influenced livelihoods in local communities. In other words, the important question of how mining impacts socio-economic wellbeing in the surrounding regions remains unanswered. Therefore, in order to have a better understanding about the relationship between mining and socio-economic wellbeing at the local level, further research is required.
Chapter 4: Indicators of Mining in Development: A Q-Methodology Study of Two Gold Mines in Quang Nam province, Vietnam

Prologue

This chapter was published as a peer-reviewed article in the journal Resource Policy (https://doi.org/10.1016/j.resourpol.2018.02.014). The main aim of the chapter was to evaluate the influence of mining on local development using a series of indicators that had previously been applied in an African context. The formulation of these indicators was based on the Sustainable Livelihoods framework and the work of Tonts et al. (2013a) and Horsley et al. (2015) in Ghana and Zambia. By using these indicators, the research focused on understanding local communities’ subjectivities regarding the impacts of the mining activities on their lived experiences and perceptions of changes in Phuoc Duc and Tam Lanh communes, Quang Nam province. Both of these locations are noted as having a long history of resource-led development.

Data collection took place in the field by employing a Q-methodology, which has been utilised in a number of different empirical and disciplinary contexts as a means of quantifying local people’s perceptions on given issues. As local subjectivities regarding resource extraction are complex and diverse, the Q-methodology allows for the identification of distinct and comparable viewpoints within and between study communities. Results indicated that within Phuoc Duc commune, perceived impacts on the standard of living, livelihoods, health, and quality of life were all concerns of local residents. Perceptions of residents in Tam Lanh indicated a concern for impacts on health and the standard of living as well as limited government protection.
Abstract

Mining plays an increasingly important role in Vietnam’s economy and has been central to the economic and social development strategies of a number of provinces. Yet, to date, the ways in which mining is experienced by local residents in mining communities has received relatively little attention. This research employed Q-methodology to examine community perceptions concerning the impact of gold mining in Phuoc Duc and Tam Lanh communes, Quang Nam province, Vietnam. As local subjectivities regarding resource extraction are complex and diverse, Q-methodology allows for the identification of distinct and comparable viewpoints within and between study communities. Results indicate that within Phuoc Duc commune, perceived impacts on the standard of living, livelihoods, health, and quality of life were all concerns of local residents. Perceptions of residents in Tam Lanh indicated a concern for impacts on health and the standard of living as well as limited government protection. Findings from the two case studies suggest that local people’s subjectivities about mining impacts were highly nuanced and influenced by geography, demographics, history and culture.
4.1. Introduction

The impact of mining on local communities in the developing world has been a vibrant area of academic inquiry for several decades (e.g. Bebbington et al., 2008, Aragón et al., 2015, Gilberthorpe and Hilson, 2016, Aragón and Rud, 2016). This body of work is expansive and highlights the diversity and complexity of the relationship between mining and people. In some cases, scholars highlight increased economic activity, job creation, infrastructure development and social benefits (Akabzaa, 2009a), while in others attention is drawn to issues such as environmental degradation, income, the displacement of Indigenous peoples and social upheaval (Doyle et al., 2007b, Aragón and Rud, 2013, 2016). While a strong tradition of research on mining and development exists across Asia, relatively little work has been undertaken on Vietnam (Tran et al., 2012). This is despite mining playing an increasingly important role in the economies of a number of Vietnam’s provinces (Khoi, 2014). The paucity of mining related research in Vietnam is in large part the result of restrictions placed on foreign scholars and bureaucratic limitations on researchers within Vietnam (Waibel and Ehlert, 2012). The research that has been conducted has focused primarily on mineral exploration and the politics of foreign investment (e.g. Carlyle, 2009), and not addressed the ‘lived experience’ of people in areas where mining is a significant economic activity.

Resource-based communities are diverse, and their development trajectories and social dynamics vary considerably according to local social and political contexts, commodity type and the business structures associated with resource extraction (e.g. Auty, 1997, Addison et al., 2017, Chuhan-Pole et al., 2017). This diversity drives both the direct and perceived experiences of local communities. Local perspectives are complex and varied, and capturing these viewpoints is challenging (Chapman et al., 2015b). A small number of Vietnamese researchers are beginning to pay attention to the relationship between mining and development at the
community level (Tran and Nguyen, 2010, Tran et al., 2012) however, much of this work remains broad, with a focus on cross-sectional quantitative research that does not address experiences at the local level. Where detailed research has taken place, scholars have focused on a single or narrow range of issues, such as income distribution and job creation (Tran et al., 2012).

This paper begins to address this lacuna through an examination of local perceptions of the impact of gold mining on communities in Phuoc Duc and Tam Lanh communes, Quang Nam province, Vietnam. The study focussed on residents’ views on income generation, pollution, health, employment, conflict, safety and crime, reinvestment, equity, and environmental impacts. The research was undertaken using Q-methodology, which provides a systematic, quantitative means of capturing subjective local perceptions through field-based interviews. While Q-methodology has a long history in the social sciences, only recently has it been applied to understanding community perceptions regarding mining and development (Chapman et al., 2015; Weldegiorgis and Ali, 2016). Results indicate that while there were a number of common themes in the perceptions of residents in both localities, there were important differences that relate to local culture, political context, and environmental conditions. Importantly, the paper demonstrates that policy responses and development practices need to not only account for local perceptions, but also recognise the importance of distinctive geographies, histories and cultures.

4.2. Methods

4.2.1. Study Area

The research was undertaken in two locations: Phuoc Duc commune, Phuoc Son district, and Tam Lanh commune, Phu Ninh districts, Quang Nam province. Both communities support gold mines owned by Besra, a Canadian firm with properties in New Zealand, Malaysia and the
Philippines. Gold mining was first conducted in Phuoc Duc during the French colonial period (prior to 1945) however, records of these activities are unavailable (Steven and Fulton, 2008). More recently, a gold exploration license was granted to Besra in 1999 and a processing plant was subsequently commissioned in 2011 (Besra, 2016a). In contrast, the people of Tam Lanh experienced several periods of mining activities, the first during the 1880s and again in the 1940s (Stevens and Fulton, 2007). Besra received a license to operate in Bong Mieu in 1997 but it wasn’t until a decade later that a gold processing plant was built (Besra, 2016a).

According to Phuoc Son statistics (PSS, 2015), Phuoc Duc is a remote area with a population of 2,400. More than 60% is Indigenous with 49.34% living in poverty according to the 2014 census. Historically, livelihoods of villagers in the commune was based on agriculture and commercial afforestation. However, mining now plays a significant role in income generation and employment in the commune.

In Phu Ninh province, Tam Lanh occupies a mountainous location with a population of 6,708 (0.5% Indigenous) and a poverty rate of 3.93% in 2014 (PNS, 2015). Similar to Phuoc Duc, the livelihoods of local residents are based on agriculture and commercial afforestation with mining employment increasing in recent years.
4.2.2. Selecting indicators of mining and development

According to Merriam-Webster (2016, p.1), the term indicator is defined as “any of a group of statistical values that taken together give an indication of the health of the economy”. Indicators are measures derived from ‘observable facts’ allowing for the examination of ‘relative position’ when comparing two or more entities (Nardo et al., 2005). At regular intervals an indicator can be used to examine trends, highlight issues, monitor performance and inform policy however, it is important that indicator selection has theoretical grounding.

According to Azapagic (2004), indicators used to examine impacts from mining on local stakeholders generally address three areas of interest: economic issues (e.g. GDP and job creation), environmental issues (e.g. biodiversity loss, land use and pollution), and social issues (e.g. employment, education, health and safety). From a theoretical perspective, the sustainable
livelihood framework (SLF) provides a foundation for examining the interplay between mining and development (Horsley et al., 2015c). It also provides direction for the selection of indicators for measuring the impacts of mining on the development process (Weldegiorgis and Ali, 2016). From a capitals perspective, the SLF highlights the role of assets in mitigating the impact of shocks to the system (DFID, 1999).

Grounded in the SLF, this research employed indicators first identified to examine the impact of mining on communities in Africa under the International Mining for Development Center (IM4DC). This work focused on examining the relationship between mining and development in Ghana, Zambia, Rwanda, and Indonesia. Their results provide insight into the impacts of mining on local communities using a ‘Rapid Assessment Framework for Mining and Regional Development’. Based on this framework, a list of 25 indicators were identified by Tonts et al. (2013a) (Appendix 4.1) highlighting a broad range of mining related impacts on local communities. A desktop review of literature focusing on mining impacts in Vietnam suggested that many of the indicators identified by Tonts et al. (2013a) were applicable to the Vietnam situation. Therefore, rather than develop a new set of indicators, those previously identified under the work of the IM4DC were used in this research to 1) compare the Vietnam experience with that of Africa, and 2) strengthen the case for a universal set of measures.

4.2.3. Measuring community perspectives

In the context of rural development, Rapid Rural Appraisal (RRA) and Participatory Rural Appraisal (PRA), are acknowledged as approaches allowing for greater local participation in identifying issues effecting local residents (Chambers, 1994). Indeed, these tools were designed to inform the development planning process, however implementation can be extremely resource intensive (Townsley, 1996). Whilst, RRA may be an appropriate approach for
collecting data in fragile and conflict-affected regions (Mastri, 2008) important information can be lost due to optimal ignorance and proportionate accuracy (Chambers, 1981).

Importantly, PRA and RRA have methodological deficiencies that may render these approaches inappropriate for quantifying human’s perspectives. For example, Chambers (1993) identified that PRA is sensitive to personal behaviour, attitudes, beliefs, commitment and cannot generate commensurable quantitative information. In addition, Heaver (2001) identified that the success of PRA depends on the behaviours of those collecting data, and the relationships between villagers and outsiders. Others disadvantages of PRA, as identified by Townsley (1996) and World Bank (1996), includes an inability to ‘scale up’ information (raising expectations which cannot be realised) and a failure to capture stratifications within communities.

In contrast, the Q-method(ology) was developed and advanced as a tool for measuring people’s perceptions (Stephenson, 1953). In the past several decades, the approach has experienced a resurgence applied widely in political, socio and environmental sciences including geography, planning, agriculture, health, and economics (e.g Brown, 1980, Webler et al., 2007, Ellingsen et al., 2010). The Q-method provides not only a principle framework to study human subjectivity, but also comprehensive techniques to preserve the depth, diversity and individuality of a more humanistic approach (Brown, 1980, Eden et al., 2005, McKeown and Thomas, 2013).

In the last few years, the Q-method has been employed as a powerful approach to discern people’s experiences and perceptions of changes due to the extractive activities (e.g.Chapman et al., 2015b, Weldegiorgis and Ali, 2016). First, by combining both quantitative and qualitative collected data, the Q-method is more efficient at identify the reasoning behind certain
viewpoints (Brown, 1980). Second, Q-method is realised as a participatory practice because involvement of local people is a prerequisite (C. Donner, 2001). Third, the Q-method allows for the capture of individual and/or group perceptions in a short period of time, and requires a low number of observations to develop a sound representation of the target population. Overall, Q-method data is easy to collect, analyse and present in a timely manner (C. Donner, 2001, Exel and Graaf, 2005, Watts and Stenner, 2012).

4.2.4. Q-Methodology

To develop a set of indicators examining the impact of mining on communities in Vietnam, a bottom-up approach was informed by the SLA framework and previous studies (Horsley et al., 2015c). The research presented here employed a Q-methodology approach to understand the perceived importance of impacts from mining on local communities.

In the most common form, Q-method includes the selection of a set of statements where participants are asked to place each onto a grid (quasi-normal distribution) ranging from most agreeable to most disagreeable (Zabala, 2014). The method is comprised of four main steps: development of a concourse, selection of respondents, administration of Q-sort interviews (or focus groups), and data analysis which consists of Principal Component Analysis (PCA) to identify similarities and differences in responses. Each of these steps are described in more detail below.

4.2.4.1. Concourse construction

The first stage in the implementation of a Q-methodology is the development of a concourse (Ellingsen et al., 2010) and ‘statements’ used in the sorting process (Brown, 1993). The ‘statements’ used in this study were initially designed to capture a range of perspectives concerning the impacts of mining on local communities (Phuoc Duc and Tam Lanh
communes). As stated previously, these ‘statements’ were adopted from previous work by Tonts et al. (2013a) in Africa.

4.2.4.2. Participant selection (P-set)

For the Q-method, representing a diversity of views is more important than the number of samples (Rogers, 1995). The selection process is therefore important to avoid an unduly homogenous respondent group that balances participant diversity and limits bias (Watts and Stenner, 2005). In this study, participants were selected using a chain referral method or ‘snowball’ sampling technique deemed appropriate for the Q-method (Watts and Stenner, 2005). This typically started with the village head or a leading government official followed by company representatives, and finally local community members including farmers, students, trade persons, miners, fisherman, and retired individuals. The aim was to capture a sample that spanned a range of interest groups and views. In total, 137 people engaged in individual Q-method interviews, 56 from Phuoc Duc, 64 from Tam Lanh, 9 district staff, and 8 provincial staff.

Table 4.8: Number and type of study participants

<table>
<thead>
<tr>
<th></th>
<th>Phuoc Duc</th>
<th>Tam Lanh</th>
<th>Two districts</th>
<th>Province</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>Local residents¹</td>
<td>10</td>
<td>19</td>
<td>37</td>
<td>14</td>
<td>47</td>
</tr>
<tr>
<td>Miners</td>
<td>14</td>
<td></td>
<td>14</td>
<td></td>
<td>18</td>
</tr>
<tr>
<td>Mining management</td>
<td>1</td>
<td></td>
<td></td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>NGO (World Vision staff)</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Gov. authorities²</td>
<td>4</td>
<td>6</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>26</td>
<td>45</td>
<td>19</td>
<td>6</td>
</tr>
</tbody>
</table>

1. Local residents represented farmers, traders, students, youth, retired, housewives, miners, fisherman, unemployed persons.
2. Government authorities included the People's Committee, Departments of Natural Resources, Agriculture, Social Affairs and Culture, Education and Health, Infrastructure.
4.2.4.3. Q-sort administration

The Q-sort procedure was administered face-to-face by the first author in Vietnamese with each participant individually. A short explanation of the study’s aims and methodology was provided, followed by basic demographic questions. Next, a fixed board with an upside down pyramid of 25 boxes representing a quasi-normal distribution (figure 4.8) was shown to the participant along with 25 cards each containing a ‘statement’ (in Vietnamese) representing mining impacts (Q-set). Participants were asked to place the ‘statements’ on the board in accordance with the perceived level of agreement or disagreement. The ‘statements’ were ranked (or sorted) from least important (-4) to most important (+4). Statements could be moved as many times as the participants’ wished until they were satisfied with the final ranking. After sorting, participants were asked several follow-up questions including why they selected certain ‘statements’, and which indicators they felt were missing?

![Figure 4.8: Concourse representing an upside-down fixed quasi-normal distribution used on the Q-sort process.](image)

4.2.4.4. Data Analysis and interpretation

Principal Component Analysis (PCA) was used for data reduction employing a ‘varimax’ rotation (Watts and Stenner, 2012). PCA is a statistical method which reduces complexity in correlated variables and transforms this information into a set of uncorrelated factors (Hothorn
and Everitt, 2014). A PCA highlights patterns of similarities and distinctions among the viewpoints of the study participants. These patterns provided the fundamental framework for selecting factors representing commonalities among study participants’ perceptions (Watts and Stenner, 2012).

4.3. Results

4.3.1. Factor selection

The selection of an appropriate number of factors representing participant viewpoints is somewhat subjective (Watts and Stenner, 2012). A number of factor selection approaches are discussed within the literature including: assessment of eigenvalues\(^1\), the Watts and Stenner’s metric, Brown and Humphrey’s rules, scree plot examination and parallel analysis to name a few.

This research employed scree plot and parallel analysis (PA) as a factor selection approach. PA is a simulation-based technique which provides for the retention of the maximum number of factors with observed eigenvalues greater than those extracted from corresponding factors based on random uncorrelated data (Ledesma and Valero-Mora, 2007). According to Zwick and Velicer (1986), PA is an appropriate method to determine the number of factors representing high accuracy, low variability, and enhanced sensitivity.

Figure 4.9 and 4.10 identify that five factors should be retained for Phuoc Duc and three for Tam Lanh. In these figures, the optimal coordinates (OC) corresponds to an extrapolation of the proceeding eigenvalues and the acceleration factor (AF) corresponds to a numerical solution highlighting the elbow of the scree plot (Raiche and Magis, 2015). According to

\(^1\) An eigenvalues are the sum of squared loadings of all q sorts on a factor
Ruscio and Roche (2012), the OC method is better than AF and correct 74.03% of the time. Therefore, the cut-off point to retain factors was identified using the OC approach.

Figure 4.9: Scree plots and parallel analysis identifying appropriate number of components for Phuoc Duc.

Figure 4.10: Scree plots and parallel analysis identifying appropriate number of components for Tam Lanh
4.3.2. Factor interpretation

Appendix 4.2 and 4.3 identify how statement’s ‘load’ or were correlated with each factor. A positive factor loading indicates that the associated statement is positively correlated with the factor representing ‘agreement’. Conversely, negative loadings represent ‘disagreement’ between the statement and the factor. A significance level of (+/- 0.516) (p<0.01) was used as the cut-off point criterion for interpretation. If a statement had a z-score larger than +0.516 or smaller than -0.516, it was considered for interpretation. A large majority of the statements were significant for at least one factor for each community. This indicates the relevance of statements in describing perceived community life experiences and the impact of mining operations. Overall, five factors explained 51.23% of the variance in Phuoc Duc commune and three factors explained 43% of the total variance in Tam Lanh commune.

4.3.2.1. Phuoc Duc

There were five dominant perspectives (factors) identified for Phuoc Duc commune (Appendix 4.2). These represent standard of living, livelihoods, health concerns, financial improvement, and quality of life respectively. Correlations between z-scores were fairly low but significant (p<0.01).

A number of consensus statements existed for Phuoc Duc commune including ‘drinking water quality’ loading positively on all five factors. In addition, air quality was perceived to be of concern by participants represented by factors 1, 3 and 5. As both consensus statements relate to impacts on natural resources, this indicates perceived environmental degradation.
4.3.2.2. Tam Lanh

There were three dominant factors identified by participants in Tam Lanh commune (Appendix 4.3). These include perceptions concerning a need for protection, health, and standard of living. The shared perspective of a need for protection appears greater than the others.

Consensus statements included drinking water quality (stat 1). In particular, statement 1’s positive loading for factor 1 (+3), factor 2 (+4), and factor 3 (+1) highlights high levels of perceived concern by Tam Lanh residents. Similarly, statement 21’s negative association with factor 1 (-1), factor 2 (-2), and factor 3 (-2) highlights that despite mining, residents perceive an ability to access natural resources.

4.4. Discussion

4.4.1. Emerging key patterns in perceptions

Overall, three clear groupings of perceptions emerged in Phuoc Duc and Tam Lanh communes (Table 4.9). The first was concerned with pollution and health issues. The second was concerned with economic uncertainty, particularly in regard to the development of backward and forward linkages as well as the temporary closures of mines which led to unemployment, income instability and tax debts. The third group of perceptions was concerned with social upheaval including increased drug use, crime and safety, and tensions between the mining company and local people.
Table 4.9: Summary key participant concerns in Phuoc Duc and Tam Lanh communities.

<table>
<thead>
<tr>
<th>Themes</th>
<th>Perceived Impacts</th>
<th>Phuoc Duc</th>
<th>Tam Lanh</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Environmental</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water pollution</td>
<td>Gynaecological infections</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dermatological infections</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Livestock fatalities</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Drinking water</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Air pollution</td>
<td>General health concerns</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Noise</td>
<td>Dust</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>2. Economic</strong></td>
<td>Limited economic diversification</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Backward and forward</td>
<td>Unemployment</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>linkages</td>
<td>Income instability</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Mine closures</td>
<td>Tax debt</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Property rights</td>
<td>Land tenure rights</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Access to arable land</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><strong>3. Social</strong></td>
<td>Drug use</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Social upheaval</td>
<td>Crime and safety</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Tensions</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Table 4.9 indicated that perceptions the degree and type of mining impacts in both regions are different. Whilst general health concerns from environmental degradation were identified by residents of both study locations, people in Phuoc Duc expressed concerns for gynaecological and dermatological illnesses more specifically. Similarly, participants in both study locations had negative perceptions of economic growth including unemployment and income uncertainty however, concerns about limited economic diversification were greater in Phuoc Duc. By contrast, disagreement over access to arable land emerged in Tam Lanh only but tensions between the mine and locals occurred in both locations (slightly more intense in Phuoc Duc). On the contrary, people in Tam Lanh blamed mining as a cause for drug use and criminal activity as they perceived these problems were on the rise.
4.4.2. Factors leading to differences in community perceptions

Although there are several similar perceptions, different subjectivities between Phuoc Duc and Tam Lanh can be found in detail (negatively and positively significant loading \(p<0.01\)) in Appendix 4.2 and 4.3. Factors including demographic, culture, remoteness, mining history and ‘path dependence’ are acknowledged as critical issues affecting differences in participants’ points of view.

The demographic composition of each community is also a key factor in differences of perception. While a majority of the population in Phuoc Duc is an ethnic minority, the Tam Lanh population is comprised of Kinh people (PSS, PNS, 2015). This has led to distinct differences in employment patterns as census figures indicate that the unemployment rates of ethnic minorities in Phuoc Duc may be higher than that of the Kinh in Tam Lanh.

Similarly, differences in culture and tradition can influence perceptions of crime and safety (Ruddell and Ortiz, 2015). For example, Indigenous people are close-knit communities (World Bank, 2009) making it more difficult to commit crimes. In contrast, the Kinh communities are open to immigrants (Dang, 2012) and it is feared that many of those are drug dealers and addicts with criminal records. Consequently, the rate of drug addicted of young men in Tam Lanh is substantially higher than Phuoc Duc which has resulted in significant concern.

Community remoteness also influences perception (Storey, 2010). Given that Tam Lanh is much closer to the Province’s business centre, opportunities to diversify income with non-farming jobs is greater. In addition, the gold processing plant in Tam Lanh has been operating longer than in Phuoc Duc, even during restricted periods, (Besra, 2016a, 2016b) which has resulted in a longer period of job creation and economic diversification. This has led to differences in perceptions of income development and employment.
Mining history has also influenced people’s perceptions in the region (Massey, 1991). According to Stevens and Fulton (2007), (2008), Tam Lanh has considerably longer periods of gold mining compared to Phuoc Duc. Interviewees indicated that the people of Tam Lanh possessed a more nuanced view of mining impacts on social wellbeing when compared to Phuoc Duc, where perspectives are largely pro mining. This mirrors previous findings which have shown that communities with a limited mining history are more likely to expect positive effects regarding employment, business generations and diversification of opportunity (Chapman et al., 2015b).

Furthermore, our results give rise to questions concerning regional development policy and practice, of which, ‘path dependence’ is a notable implication (Tonts et al., 2014). According to Plummer and Tonts (2013) and Tonts et al. (2014), ‘path dependence’ describes local or regional outcomes which are shaped by past events and due to ‘path dependence’, regional development may drive to ‘lock-in’ development alternatives. In other words, histories are often reflected in contemporary or future development trajectory of regional economic strategies, which also shapes local discourse concerning the economy, institutions, values and policy decisions (Chapman et al., 2015b).

4.4.3. Perceptions of mining impacts: a critical analysis

In Phuoc Duc and Tam Lanh, it has been suggested that Besra’s gold mining operations have resulted in environmental pollution. However, field observations and interviews with local residents reaffirmed perception that artisan and illegal mining has also impacted the environment. These miners discharged muddy waste water containing both cyanide and mercury directly into rivers on a regular basis without prior treatment.
Furthermore, whilst gold mining has been perceived to be associated with social problems it has been argued that the situation might be worse without Besra operating in the region. For example, local official in Phuoc Duc highlighted that before 1998, social upheaval was a serious issue in the region due to local miners’ fighting over mining tenements, but after 1998, the situation improved because Besra manages a significant area of gold deposits reducing conflict between artisanal miners.

Indeed, several interviewees blamed artisan and illegal mining as one of the drivers of environmental and social problems. However, these subjectivities are not necessarily universal and it may be that some people do not remember the situation before 1998 or are heavily influenced by specific actions by the mining company such as the illegal discharge of untreated waste water (Besra, 2013), tax debt (207/TB-VPCP/2016) and lack of appropriate cyanide management (15.012-013.01-GDTM/N2).

Limited perceived development of forward and backward linkages in Phuoc Duc and Tam Lanh mirror what has been found in other developing regions. As Robbins (2013) pointed out, mining companies are often likely to have minimal engagement with local and national economies. These situations, for instance, have been identified in Ghana, Botswana, Angola and Tanzania (Morris et al., 2012).

It is not always that mining companies are averse to working with local businesses. In the context of Phuoc Duc and Tam Lanh, it is challenging for local enterprises to satisfy the gold company’s order requests. Supermarkets in cities are preferred over local suppliers due to higher hygiene standards and an ability to deliver higher quality products at the desired quantity. Similarly, local enterprises are unable to provide heavy trucks required to transporting
ore from Phuoc Duc to Tam Lanh forcing the mining company to outsource transportation contracts to capable enterprises outside the regions.

Noise and pollution associated with increased mining related traffic was often perceived by interviewees as a result of road infrastructure upgrades. However, infrastructure improvements have provided for enhanced connectivity between local communities, regional centres and the outside world in general. Several interviewees acknowledged that due to better roads, opportunities for economic growth have increased as trucks can now access farmer’s produce more readily resulting in higher prices at the farm gate.

In regards to the rights of Indigenous peoples, the mining company has adopted free, prior and informed consent (FPIC) guidance in both Phuoc Duc and Tam Lanh, and communicated their intentions through formal communications (153-09/PSGC/24-09-2009) with the People’s Committee and the Fatherland Front (04/11-01-2010, 02/11-01-2010, 366/CV-UBND/30-11-2009). However, in these communes, extensive consultation with local communities, and in particularly Indigenous peoples, was unlikely effective.

These arguments may help to explain why tensions between local communities and the mining company exist. However, much of the tension can be traced back to differences in expectations. For instance, local community members communicated an expectation that higher levels of locals would be recruited by Besra but mining companies often cite difficulty in employing local people due to low levels of education and a lack of technical skills (Akabzaa and Darimani, 2001). According to Garvin et al. (2009), variability in expectation is a likely driver of mistrust eventuating in conflict.
Misunderstanding of what the relationship should be between local residents and mining companies can also lead to conflict. Garvin et al. (2009) highlighted that whilst local people’s perspectives towards this relationship is often patronising, the company’s operations are driven by profit not philanthropy. Indeed, poverty can be pervasive in mining regions (Campbell and Akabzaa, 2009) and local communities “frequently find themselves betrayed, cast aside and disconnected from the processes of development and modernity” (Ferguson, 1999, p.236).

In a comparison with other mining regions in Vietnam, there are similar perceived concerns regarding unemployment and water contamination in Tan Pheo, Loc Phat, Ea Sa, Son Thuy and Con My (Tran et al., 2012). Similarly, Q-method research in Ghana and Zambia also indicated that unemployment and drinking water quality was one of the greatest concerns of local communities (Horsley et al., 2015a). However, Q-method research in Rwanda indicated that impacts of mining on water was not a serious concern, but employment was highly valued (Weldegiorgis and Ali, 2016).

Likewise, local people in mining regions in the Central Highlands and Ban Thi were very concerned about their health due to pollution, but social upheaval was not a problem (Lan, 2007, Morris, 2013). Similar health concerns were found in Ghana, but it was not an important issue in Zambia and Rwanda. By contrast, safety and crimes was not an issue in Ghana, but it was a serious concern in Rwanda (Horsley et al., 2015a, Weldegiorgis and Ali, 2016).

4.5. Conclusion

This research employed Q-methodology to understand people’s subjectivities concerning the impacts of gold mining on local communities in Quang Nam province, Vietnam. The clear patterns of local community perceptions in Phuoc Duc highlight concerns for the standard of living, livelihoods, health, financial improvement and quality of life. Likewise, in the Tam
Lanh commune interview participants showed concern for crime and safety, health, and the standard of living. Findings indicate that whilst there are similarities, the patterns of experiences and perceptions of local people in the two mining sites are highly nuanced and depend substantially on geography, demographics, history of mining extraction and culture.

The research indicated that environmental pollution and households’ financial improvement were key representatives of the perceived concerns from mining. Due to contamination of drinking water and quality of air, local people were concerned about health and mining operations were blamed for the problem. In addition, unemployment and unstable income were perceived concerns. This indicates that jobs created in the regions are perceived to be insubstantial and stable incomes are crucial for local residents.

To this end, the research presented here provides valuable insight for government and policymakers concerning both positive and negative perceptions of residents in the context of local mining activities operated by international companies. By clearly communicating the roles and expectations of both the local community and the mining company, future conflict may be avoided. If, the voices of local people are heard whether through the FPIC process or an applicable alternative approach, negative perception of the impacts on socio-economic wellbeing and environmental degradation can be improved in future situations.
Chapter 5: Fool’s Gold: Understanding Social, Economic and Environmental Impacts from Gold Mining in Quang Nam Province, Vietnam.

Prologue

This chapter was published as a peer-reviewed article in the journal of Sustainability (https://doi.org/10.3390/su10051355). The main aim of this chapter was to examine the differences between mining and non-mining communities regarding impacts on the environment and local socio-economic fabric. In addition, the role of ‘Corporate Social Responsibility’ (CSR) was investigated to better understand the extent to which mining contributes to livelihoods and socio-economic wellbeing. The research was conducted in Phuoc Son and Phu Ninh districts, Quang Nam province, in which Phuoc Duc and Tam Lanh were selected as the mining communities while Phuoc Nang and Tam An were chosen as non-mining communities. Data collection was largely based on field observation, interviews, and content analysis of government documents, mining company reports and scientific papers.

Results indicate that in comparison to non-mining communities, communes with active mines demonstrated increased job creation, decreased poverty rates, enhanced infrastructure and social development along with increased incidences of CSR initiatives. However, a number of adverse effects from mining activities were reported including environmental degradation, deforestation, water pollution, increased criminal activity and drug-addiction. Non-mining communities without direct benefits from mining activities can maintained economic diversity and are therefore more resilient to economic shock such as mine closures.
Abstract

Extractive industries are often claimed to contribute to both poverty reduction and economic growth. Yet, there is also a body of research that suggests natural resource dependence can result in limited development, environmental degradation and social upheaval. This paper examines differences in the socio-economic and environmental state of mining and non-mining communities in rural Vietnam in order to understand the extent to which mining contributes to livelihood development and socio-economic wellbeing. In particular, we examine the role that ‘Corporate Social Responsibility’ (CSR) plays in supporting community development in Phuoc Son and Phu Ninh districts, Quang Nam province. Content analysis of newspapers, government documents and mining company reports provided a contextual overview of mining operations and community relations in each study area. Semi-structured interviews were used to collect information from local and regional stakeholders to further understand perceived impacts of mining operations on local communities.

Our study finds that in comparison to non-mining communities, communities with active mines demonstrated increased job development, decreased poverty rates, enhanced infrastructure and social development along with increased incidences of CSR initiatives. However, a number of adverse effects from mining activities were reported including environmental degradation, deforestation, water pollution, increased criminal activity and drug-addiction. Dependence on mine related employment in local communities becomes acutely apparent when temporary mine closures result in widespread unemployment. Local governments may be the greatest beneficiaries of mining with increased tax revenues and enhanced management potential of leased land. Non mining communities without direct benefits from mining activities maintained economic diversity and were therefore more resilient to economic shocks such as nearby mine closures.
5.1. Introduction

The impacts of natural resource extraction, including mining, on local communities have been a longstanding interest of social scientists. Scholarly inquiry has identified that extractive industries contribute to both poverty reduction and economic growth (Hilson, 2002b), (World Bank, 2004). Yet there is also a body of research that indicates natural resource dependence can result in slow economic growth, environmental degradation and social upheaval (Sachs and Warner, 1997, Brunnschweiler, 2008, Addison et al., 2017).

Research on mining and development has typically focused on three areas: the impact of mining on governance, national economics and growth (e.g. Auty, 1993, Sachs and Warner, 1997, Bebbington et al., 2017, Chuhan-Pole et al., 2017); the relationship between mining and community-level social, economic and environmental change (e.g. Hilson, 2009, Kemp, 2010, Aragón and Rud, 2016); and the development of socio-economic indicators measuring mining impacts (e.g. Haslam McKenzie and Hoath, 2014, Horsley et al., 2015c, Tschakert et al., 2016). However, over the past two decades or so there has been an increasing focus amongst mining companies and governments concerning the notion of a ‘Social License to Operate’ (SLO) and Corporate Social Responsibility (CSR) in response to impacts on local communities in developing nations.

According to the World Bank (2004), SLO is the process through which mining companies engage with communities to acquire free prior and informed consent, negotiate voluntary resettlements and address Indigenous people’s rights. In contrast, CSR emerged as a culture of practice through which mining companies attempt to improve livelihoods, socio-economic wellbeing and environmental conditions in the regions in which they operate (Visser, 2008). Indeed, SLO has been seen as an element of CSR which aims to embed a number of critical
values, including accountability, credibility and stakeholders’ involvement (Meesters and Behagel, 2017).

While early research in mining and development, particularly on CSR, focused on African and Latin American communities (e.g., Manteaw, 2008, Hilson, 2012, Chuhan-Pole et al., 2017), over the past several decades the approach has also become increasingly common in South East Asia (e.g., Welker, 2009, Pimpa et al., 2015). While the discourse of CSR has become increasingly common within South East Asia, there has been relatively little research on the subject, particularly in Vietnam (e.g., Visser, 2008, Morris, 2013, Vo and Brereton, 2014a) despite the nation having a long history of resource extraction. Moreover, the country has experienced a rapid recent increase in mining activity, largely as a result of rising demand for commodities from China (Carlyle, 2009, Marston, 2012). Much of this mining activity is located in remote regions, where mining forms an important part of local livelihoods (Tran et al., 2012, Nguyen et al., 2017). The little research that has been conducted has tended to focus on a narrow set of concerns associated with environmental degradation (Whitney, 2014), economic sustainability (Hoa, 2009a), governance (Carlyle, 2009) and the impacts of resettlement on local peoples (Vo and Brereton, 2014a). What is missing is an understanding of the extent to which mining has influenced socio-economic development in mining communities particularly when compared to non-resource intensive locations.

Against this background, the purpose of this paper is to examine differences in the social, economic and environmental conditions of mining and non-mining communities in rural Vietnam in order to understand the extent to which extractive industries contribute to livelihood development, socio-economic wellbeing and environmental sustainability. The paper focuses on two case study areas in Quang Nam province that host significant gold mining activities – the districts of Phuoc Son and Phu Ninh.
5.2. Mining and socio-economic well-being at locality: a brief review

Over the past several decades, researchers have questioned the assumption that resource extraction has provided socio-economic prosperity to communities (Freudenburg and Wilson, 2002). First brought to attention in the 1960s through an investigation into ‘underdevelopment’ in Latin America (Frank, 1966), unequal exchanges in trade was highlighted where raw materials were exported from mining regions at relatively low prices and value added products were imported at higher value. In response to the mineral extraction boom of the 1980s, Godoy (1985) called for the systematic study of the social and cultural dimension of mining and development. According to Ballard and Banks (2003), Godoy’s review of industry related research, provided a framework that transformed the scope of mining research with a greater focus on mining communities, particularly Indigenous populations in developing countries.

Subsequent research has highlighted the socio-economic impacts of resource extraction on adjacent communities, particularly in the context of remote regions and ethnic minorities. For instance, the World Bank (2004) espoused the benefits of mining related job creation, infrastructure development and poverty reduction, yet the literature is replete with studies linking resource dependent communities with high proportions of unemployment and poverty (Hilson and Banchirigah, 2009, Chuhan-Pole et al., 2017), tensions between locals and mining companies (Hilson, 2002a, Bebbington et al., 2008) and increased crime (Garvin et al., 2009).

Mining activities have also been criticised as a disruptive economic endeavour causing environmental distress and health impacts (Hatcher, 2012). Resource extraction has often been cited as the main driver of environmental degradation, particularly with regards to water contamination, deforestation and acid mine drainage (Bridge, 2004b). Moreover, due to the use of toxic chemicals in the extraction process, mercury and cyanide have been linked to
community level health impacts (Aragón and Rud, 2013, Tschakert et al., 2016). Globally, volatile commodity prices are an inherent vulnerability of resource dependent communities. Volatility has been closely associated with fluctuations in mining production and employment (Tonts et al., 2012) and contributes to economic instability. The resulting uncertainty can result in a reluctance of private capital and governments to invest in resource dependent communities further constraining economic development (Eggert, 2001).

In part, the challenges associated with resource dependence are amplified by the corporate and geographic characteristics of mining operations. In many cases, resource extraction is dominated by a single firm, or a small number of firms and given the scale and capital requirements of contemporary mining, the sector is often dominated by large multinational companies. Dependence on a single firm has the potential to constrain economic diversification, particularly forward and backward linkages and increase vulnerability as prices become volatile (Rowley et al., 1996). Indeed, resource dependent communities are often frontier locations with large Indigenous populations (Kemp, 2010) where livelihoods are dependent on mining and where control over company operations is limited (Randall and Ironside, 1996).

In many respects, much of the debate around ‘unsustainable mining’ aligns with notions of the ‘resource curse’ (Auty, 1994), where economic growth in countries with an abundance of natural resources tends to be lower than in those with fewer natural resources. While evidence of a ‘resource curse’ occurring at national or regional scales is mixed, the underlying causes are complex (see (Ross, 2015)) and there remains an ongoing concern that resource abundance does not necessarily deliver on the promise of higher economic growth and improved social conditions.
Indeed, Hilson and Maconachie (2009) point out that the ‘resource curse’ has been blamed for poor economic performance, revenue mismanagement and corruption. Similarly, EITI (2005) indicated that the lack of transparency and accountability relating to payments and revenues from mining fuelled conflict and corruption, often result in bad governance, political instability and the rise of authoritarian regimes (Weinthal and Luong, 2006, NRGI, 2015). In sub-Saharan Africa, for example, resource wealth has been hoarded by the regimes controlling the regions and systematically depriving local populations of any benefit (Hilson and Maconachie, 2009). As a result, sustainable growth and development in resource-rich developing nations has all but failed (Bebbington et al., 2008).

Economics aside, by the 1980s, the rights of locals in mining areas, particularly in respect to culture, land access and livelihoods started being acknowledged by the international community for two reasons (Ballard and Banks, 2003): the emergence of ‘sustainable development’ (WCED, 1987b) and the approval of Indigenous people’s rights to Free, Prior and Informed Consent (FPIC) (UN, 2007). The FPIC concept, supported by the International Labour Convention (ILO, 1989) and United Nations Declaration on the Rights of Indigenous People (UNDRIP) (UN, 2007), was realised as a mechanism for protecting Indigenous rights to self-determination (Barrera-Hernández, 2016).

Indeed, FPIC compliance is often seen as a prerequisite for operation at a national level but not a permission to operate by local communities (Barsh, 1994, MMSD, 2002a). Therefore, in order to garner more support from local residents, Corporate Social Responsibility (CSR) was adopted as a ‘social license to operate’ (MMSD, 2002a). CSR, however, is a contestable concept even though it was designed to improve environmental and socio-economic conditions through economic, philanthropic, legal and ethical responsibility (Visser, 2008).
In the mining industry, CSR provides a framework to enhance cooperation between companies and stakeholders (Wheeler et al., 2002). In particular, CSR helps companies balance the diverse demands of communities while protecting the environment and maximising profits (Jenkins, 2004). In other words, by employing CSR, mining companies take on more responsibility including local job creation, human rights protection, welfare enhancement and environmental protection (Hamann, 2003). More importantly, CSR helps ensure acceptance and survival of mining companies within the local context (Owen and Kemp, 2013), but also the sustainable development of the industry as a whole (MMSD, 2002c).

While CSR discourse is commonplace amongst mining companies and (non)government organisations, it is not without controversy. For example, Manteaw (2008) questioned whether CSR simply fulfils a ‘social licenses to operate’ or if initiatives are genuinely aimed at improving the socio-economic wellbeing of mining communities? Kapelus (2002) also indicated that in order to reduce pressures from mining opponents, companies use CSR as an approach to address the development concerns of local communities.

However, benefits brought to local residents are sometimes inadequate (Blowfield, 2004, ChristianAid, 2004) and tensions between local communities and mining companies often occur. According to Bebbington et al. (2008) and Bebbington (2012), conflicts result from a range of impacts including land loss, water contaminations, unemployment, noise and dust. Similarly, Banks and Ballard (1997) and Kemp et al. (2011) identified tensions between mining companies and local residents which results from environmental pollution, loss of local livelihoods, health impacts and social disruption.

For commodity dependent developing nations, one of the longstanding concerns is that both forward and backward linkages created within the context of mining are often weak (Phelps et
al., 2015). Similar experiences have been noted in Ghana, Tanzania and Mali where economic
development through backward linkages was found to be negligible and the multiplier effects
insignificant (Chuhan-Pole et al., 2017). This was also found to be true in Angola, Botswana,
Ghana and Tanzania, where the breadth of linkage development (forward and backward) was
found to be limited at best (Morris et al., 2012). Ultimately however, it is likely that the ways
in which resource activity contributes to local economies is contingent on a range of context
specific attributes related to economic structure, remoteness, government policy and even
commodity type (Tonts et al., 2012).

Even in the context of developed countries, it has been argued that mining is an unlikely driver
of improvements to socio-economic wellbeing (e.g. Gaventa, 1980, Tickamyer and Duncan,
1990, Deaton and Niman, 2012). In Blackwell, a community in the Appalachian region of the
United States for example, poverty has been a persistent and pervasive issue even when coal
mining was at its peak (Duncan and Coles, 2014). Now, decades after the boom, Blackwell’s
residents have been left with rampant inequality, high levels of unemployment and mine related
illnesses (Gaventa, 1980, Duncan and Coles, 2014), an ironic corollary to what has been found
in mining communities in the developing nations including Vietnam.

5.3. Research locations

Over the last few decades, scholars have identified many of the issues described above in
relation to mining in Vietnam. Yet, to date, few comparative analyses have examined
differences in environmental impacts and socio-economic development between mining and
non-mining communities (e.g. Bui et al., 2011, Tran et al., 2012, Nguyen et al., 2017). In
particular, gold mining in Quang Nam province has brought some benefits to the region
however, many developmental and environmental issues can be identified as well. Therefore,
an analysis of the advantages and disadvantages of mining for communities in direct contact
with the industry compared with those in the surrounding region helps shed light on how mining impacts manifest themselves and are responded to. The research presented in this paper provides a picture of the benefits and challenges facing mining and non-mining communities in Vietnam with a focus on budgetary contributions, job creation, infrastructure development, unemployment, environmental degradation and social upheaval in an in-depth comparison of mining impacts.

The research described in this paper was undertaken in Quang Nam province, Vietnam where the Phuoc Son gold mine, Phuoc Duc commune, Phuoc Son district and the Bong Mieu gold mine, Tam Lanh commune, Phu Ninh district, have been operating since the early 2000s. Both are owned by Besra, a Canadian firm operating a number of mines in the region. An in-depth comparison was undertaken between a mining community and non-mining community in each location in order to examine differences in environmental impacts, livelihood development and socio-economic wellbeing attributed to the industry. In Phuoc Son district, Phuoc Duc commune (mining) was compared with the immediately adjacent Phuoc Nang commune (non-mining), similarly in the Phu Ninh district, Tam Lanh commune (mining) was compared with Tam An commune (non-mining) (Figure 5.11 and Table 5.10).
Figure 5.11: Research locations in Phuoc Son and Phu Ninh districts, Quang Nam.

Table 5.10: Summary of geographic and demographic characteristics of Phuoc Duc, Phuoc Nang, Tam Lanh and Tam An communes

<table>
<thead>
<tr>
<th>District</th>
<th>Phuoc Duc</th>
<th>Phuoc Nang</th>
<th>Tam Lanh</th>
<th>Tam An</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mine</td>
<td>Phuoc Son</td>
<td>Bong Mieu</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geography</td>
<td>mountainous</td>
<td>mountainous</td>
<td>mountainous</td>
<td>low land</td>
</tr>
<tr>
<td>Mining</td>
<td>mining</td>
<td>non-mining</td>
<td>mining</td>
<td>non-mining</td>
</tr>
<tr>
<td>Households</td>
<td>606</td>
<td>550</td>
<td>1728</td>
<td>1850</td>
</tr>
<tr>
<td>Population</td>
<td>2,400</td>
<td>2,223</td>
<td>6,708</td>
<td>7,200</td>
</tr>
<tr>
<td>Indigenous people</td>
<td>&gt; 60%</td>
<td>&gt; 60%</td>
<td>0.5%</td>
<td>none</td>
</tr>
<tr>
<td>Poverty rate</td>
<td>high</td>
<td>high</td>
<td>low</td>
<td>low</td>
</tr>
<tr>
<td>Economic sectors</td>
<td>agriculture reforestation mining</td>
<td>agriculture reforestation</td>
<td>agriculture afforestation mining</td>
<td>agriculture</td>
</tr>
<tr>
<td>Distance between two communes</td>
<td>Bordering, divided by mountains</td>
<td></td>
<td></td>
<td>25 km</td>
</tr>
<tr>
<td>Distance between commune to the provincial capital</td>
<td>Approximately 120 km</td>
<td>25 km</td>
<td>8 km</td>
<td></td>
</tr>
</tbody>
</table>
More specifically, Phuoc Duc and Phuoc Nang communes are found within the remote western reaches of Quang Nam province, central Vietnam and are inhabited by 2,400 and 2,223 people, respectively (Table 5.10). The majority of population in each commune are Indigenous with high rates of poverty. Livelihoods of villagers in each are largely based on agriculture and commercial afforestation. However, mining provides a significant employment opportunity for many males in Phuoc Duc communities.

Tam Lanh and Tam An are found within the eastern portion of Quang Nam province and are comprised of 6,708 and 7,200 residents respectively (Table 5.10). Tam Lanh lies in the mountainous reaches of the district with 0.5% of the population identified as Indigenous and livelihoods comprised primarily of agriculture and mining, with some commercial afforestation. Conversely, Tam An lies in the lowlands of the district, it is non-Indigenous population and livelihoods focused primarily on agriculture.

Finding a completely suitable corollary to Tam Lanh within the Phu Ninh district was not straightforward. Although the two communities experience different physical geographies, they are similar in demographic makeup and economic diversification. For example, the total population of the two locations as well as proportion of Indigenous population are comparable and although commercial afforestation is practiced in Tam Lanh, the primary source of livelihoods aside from mining is agriculture. Finally, approval to conduct research in the region was influenced by the government approval process and the communities in which they would allow the research to take place.

Licences for both Bong Mieu and Phuoc Son gold mines were granted in 1991 and 1992, respectively (Stevens and Fulton, 2007, 2008). Construction of the Bong Mieu mine began in 1997 with full production capacity of 500 tonnes per day attained in 2006 (Olympus, 2010,
Besra, 2016a). Similarly, construction of Phuoc Son mine begun in 1998 (1953 & 1955 QD/DCKS) with operations beginning in 2003 (2355/GP/2003) and a gold plant commissioned in 2011 with production capacity of 1000 tonnes per day (Besra, 2016a). It is worth noting that licensing for the mines were provided by central and provincial authorities and district and commune authorities wield little power in dealing with mining related issues.

5.4. Research methods

The methods used for this research were largely based on qualitative techniques. First, a content analysis was employed obtaining information from a range of sources including research manuscripts, newspapers, government documents and mining company reports. Examples include feasibility studies for Phuoc Son and Bong Mieu mining projects in 2007 and 2008 (Stevens and Fulton, 2007, 2008); the 2014 statistical yearbooks for Quang Nam province, Phu Ninh district and Phuoc Son district; government mining regulations including 513/2006/TB-UBND, 48/2007/QD-UBND and 207/TB-VPCP/2016; regional development strategies for Quang Nam province, Phu Ninh district and Phuoc Son district; and the 2010 environmental impact assessment reports for Phuoc Son and Bong Mieu mines. In addition, demographic and socio-economic information for each location was obtained, in part, through government reports and local authority statistics. It should be noted that statistical data more recent than 2014 or for the period prior to 2005 was not available and a concerted effort was made to omit information from multiple sources deemed inconsistent or unreliable.

Second, semi-structured and structured interviews were conducted with individuals and stakeholder groups to collect information from local residents, government officials and mining company employees/managers (Table 5.11). Interviews took place in person at individual’s homes, community common houses, government offices, mining sites, cafés and shops. Interviews lasted approximately 1 hour and primarily occurred in the evenings after work for
local community members. In Phuoc Duc and Tam Lanh communes, an assistant was employed for several days to help organise meetings and interviews.

Questionnaires were tailored for the three groups: community members, government employees and mining company employees. Interview topics included mining impacts on water quality and availability, infrastructure, land, education, health care, income, employment, society and the environment. Interviews with mining employees and villagers focused primarily on local impacts on lives and livelihoods, interviews with government employees and mining management focused on regional issues such as policies used to promote and control mining operations. Participants were identified using a non-probability ‘key informant’ chain sampling approach.

Information obtained from different sources were analysed after a series of cross checks. For instance, mining related employment figures were collected from a range of sources including village, commune, district and company reports. Field observations were conducted to triangulate and validate interview data, particularly in regard to infrastructure development, corporate social responsibility initiatives and environmental degradation. Field observations included visiting mine sites, water provision facilities, and health and education facilities as well as visual inspection of roads and rivers surrounding the mines.
Table 5.11: Number and affiliation of study participants

<table>
<thead>
<tr>
<th></th>
<th>Phuoc Duc mining</th>
<th>Phuoc Nang non-mining</th>
<th>Tam Lanh mining</th>
<th>Tam An non-mining</th>
<th>District</th>
<th>Province</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male (M)</td>
<td>Female (F)</td>
<td>Male (M)</td>
<td>Female (F)</td>
<td>Male (M)</td>
<td>Female (F)</td>
<td>Male (M)</td>
</tr>
<tr>
<td>Local residents¹</td>
<td>10</td>
<td>19</td>
<td>21</td>
<td>39</td>
<td>37</td>
<td>14</td>
<td>30</td>
</tr>
<tr>
<td>Miners</td>
<td>14</td>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Mining management</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NGO (World Vision )</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gov. authorities²</td>
<td>4</td>
<td>6</td>
<td>10</td>
<td>9</td>
<td>4</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>26</td>
<td>32</td>
<td>48</td>
<td>45</td>
<td>19</td>
<td>39</td>
</tr>
</tbody>
</table>

¹Local residents representing farmers, fisherman, traders, students, the elderly, housewives and unemployed persons.
²Government authorities included the People’s Committee and the Departments of Natural Resources, Agriculture, Investment, Planning, Social Affairs, Indigenous and Culture, Education and Health and Infrastructure.

To undertake field data collection, ethics approval was applied for and granted by the University of Western Australia followed by permission from Quang Nam People’s Committee. Next, permissions were obtained from each district and commune (case study). The researchers then worked with heads of each village to organise individual and group interviews or organise meeting times directly with government authorities, mining company employees and NGOs.

5.5. Results and discussion

5.5.1. Economic development

5.5.1.1. Job creation

Phuoc Son mine in Phuoc Duc commune, Phuoc Son district has created a number of jobs opportunities for adjacent communities. In 2013, a company labour report identified that 128 people in Phuoc Duc were employed by the mine accounting for 15% of its total labour force. By contrast, the number of employees recruited from the adjacent non-mining community Phuoc Nang was 40, accounted for approximately 5% of the mine’s employees. The proportion
of Phuoc Duc households in which a person works for the mine was 21% whilst the proportion was approximately 7% in Phuoc Nang. Interviews with community members indicated that these figures are important indicators of poverty reduction as income of families with persons working for the mine were more secure than those without.

The Bong Mieu mine in Tam Lanh commune, Phu Ninh district has generated a significant number of jobs for local residents. Interviews with district authorities and mining staff indicated that approximately 300 to 450 residents from Tam Lanh were recruited to work in the mine between 2010 and 2013, accounting for approximately 40% of the labour force. However, this number is likely lower according to a report by the provincial Department of Natural Resource and Environment (DNRE) in 2014, showing that only 59 people in Tam Lanh had actually been recruited to work in the mine (14% of the labour force).

In contrast, interviews and statistical reports for Tam An indicated that, in 2014, no residents were employed in the mine and only a few businesses were supported by mining activities. Based on a DNRE report (2014), 111 employees were recruited from communes within Phu Ninh district (excluding Tam Lanh). The distance from Tam An to Bong Mieu mine is approximately 25 km whilst other communes are located closer and would be expected to have a greater portion of their labour force employed in the mine. This provides an indication of the mine’s geographic sphere of influence.

5.5.1.2. Poverty reduction

Based on commune and district statistical accounts, poverty rates in Phuoc Duc fluctuated between 2005 and 2009 and were below those of Phuoc Nang in the period between 2010 and 2014 (Figure 5.12). Poverty was measured based on monthly or annual income as defined by the Government for each time point (Nguyen et al., 2017) which may partially, but not entirely,
account for fluctuations in the poverty rate. In 2006 and 2010, government decision No 170/2005/QĐ-TTg was applied, classifying families as ‘poor’ if their income was less than VND 200,000 and VND 260,000 per person per month, respectively. In 2011 and 2015, decision No 09/2011/QĐ-TTg was applied, classifying families as ‘poor’ if their income was less than VND 400,000 and VND 500,000 per person per month, respectively.

![Figure 5.12: Poverty rates for Phuoc Duc and Phuoc Nang, 2005-2014 (PSS, 2015)](image)

During the period from 2005 to 2009, poverty rates in Phuoc Duc were higher than Phuoc Nang, except for the years 2006 and 2007. In 2010, the poverty rates of Phuoc Duc and Phuoc Nang was 79% and 80% respectively and whilst both communes experienced a reduction in residents living below the poverty line, by 2014 Phuoc Nang’s poverty rate was 12 percentage points, higher than that of Phuoc Duc. Whilst it is difficult to infer a causal relationship, there is an indication that employment in the mine may have contributed to these differences. More specifically, one women interviewee identified that “her husband’s salary from working for the mine is regular and stable which is important for their family”. This was also highlighted by an interviewee from the Phuoc Duc authority who stated that “income from people working for
the mine has been a key driver in reducing the commune’s poverty rate”. In recognition of the World Bank’s reasoning that mining contributes to job creation and income generation in rural communities (Pegg, 2006), the Phuoc Duc example indicates that mining may have contributed to poverty reduction.

Poverty rates in Tam Lanh commune (mining) were higher than those of Tam An commune (non-mining) between 2010 and 2013 (Figure 5.13). The difference in poverty rates between the communities decreased considerably during this period and by 2014, the poverty rate in Tam Lanh had reduced to a point lower than that of Tam An and mining may have been an important factor. Local miners in Tam Lanh confirmed that employment in the mine was important for their families and had generated stable incomes. In addition, a small retailer in the region stated that “trade had increased largely based on the increase in mining jobs”. Similarly, one retired government employee stated that “local miners’ income is quite good and has helped decrease poverty in the commune”.

![Figure 5.13: Poverty rates for Tam Lanh and Tam An communes, 2010-2014 (PNS, 2015)](image-url)
Mining operations in Phuoc Son have created some opportunities for local economic growth. Interviewees indicated that the gold processing plants have resulted in the establishment of a number of services supplying production including hotels, petrol stations, transport firms and food suppliers (i.e. backward linkages). In addition, 6666, a privately-owned company, has been permitted to collect gold and lead in mine tailings which provides additional economic development opportunities for the local community.

5.5.1.3. Infrastructure development

Phuoc Duc has also benefited from infrastructure development as a result of mining. A ten kilometre road connecting the National Highway to the gold plant has been constructed by the mining company along with upgrades to two bridges. As the road network provides the backbone of infrastructure in the region, its development has resulted in improved accessibility, facilitating increased trade and labour mobility. One local interviewee highlighted that “due to the upgrade to roads and bridges, trucks can access farms to purchase forest products and this has increased prices”. Of note is that while the construction of this infrastructure was primarily for the benefit of the mine, it has broader benefits for other sectors such as agriculture.

In contrast, infrastructure development in Phuoc Nang has largely depended on budget allocations from provincial and district governments. Statistics indicate that on average, the total budget allocated for development in Phuoc Nang was approximately VND 2-2.5 billion (estimated USD 100,000-125,000) per year between 2010 and 2014. Budget allocations over the last several years has resulted in the paving of 72% (4.4 km) of roads connecting villages, 84% (0.65 km) of village internal paths and 50% (8 km) of roads to fields. Interviewees highlighted that what has been paved is a result of an ambitious ‘new rural’ programme put forth by the Government which draws on contributions from local residents. The 2014 report on the ‘new rural’ program (no number, September 2014) indicated that local resident’s
contribution accounted for 1% of total expenditures with Phuoc Nang commune government contributing nothing.

Development of infrastructure by the mining company has benefited villagers in Tam Lanh. For example, in 1992, sixteen kilometres of sealed roads were built from the main road to the mine. In 2006, five kilometres of roads were built to connect Village 5 to the mine and in 2012 a three kilometre road from Village 6 to Que Phuong Bridge was paved. These roads, constructed by the mining company, have provided great advantages for local people, increasing trade and promoting economic growth. Furthermore, contributions to the commune’s infrastructure budget have reduced financial burdens on the district government of Phu Ninh.

In contrast, infrastructure development in Tam An has not benefited from the mining company as Tam An largely relies on allocations from the provincial and district governments. Interviewees indicated that the total budget allocated for development in Tam An was approximately VND 1.5 billion (USD 75,000) in 2010 but increased to approximately VND 4 billion (USD 200,000) between 2012 and 2014. Whilst, these amounts were for substantial development investments (i.e. roads, irrigation, community houses, health clinics, schools and markets), field observations and a report from the commune (130/BC-UBND/03-12-2014) showed that 78% (14 km) of the village was connected by roads and 96% (16 km) of village paths and 73% (8 km) of roads to fields were being paved. These findings were the result of the ‘new rural’ programme put forth by the Phu Ninh authority (6166/QD-UBND/29/11/2011) using volunteered local labour and building materials supplied by the authorities.
5.5.1.4. Tax revenue

In Phuoc Duc, local government budgets have also received a positive contribution from mining activities. Specifically, environmental and natural resource taxes provide substantial revenue for local governments. Interviewees indicated that in 2012 and 2013 these taxes accounted for appropriately 14% and 43% of total revenue for the commune. As identified by a Phuoc Duc commune staff member, “tax contributions from the mine are crucial for socio-economic growth”.

On the contrary, revenue in Phuoc Nang depended heavily on district allocations. Interviewees indicated that there were no businesses in Phuoc Nang so the commune receives nothing in revenue. Every year, Phuoc Nang has to submit a budget with estimates for next year’s expenditures however, approval of the plan is uncertain which constrains forward planning.

In Tam Lanh, local authorities confirmed that “taxes from the mining company are important revenue for socio-economic development”. For example, natural resource taxes and fees paid for environmental protection were reported as important revenue. These taxes were paid directly to the provincial government and proportioned to the districts and communes in accordance with decisions 32/2010/QN-UBND and 31/2013/QD-UBND. Interviewees and financial figures indicated that between 2012 and 2013, these taxes accounted for 26% and 20% of the commune’s total revenue, respectively.

By contrast, Tam An commune had not been the beneficiary of financial contributions from resource extraction activities. Budget allocations from the district government were not enough to cover expenditures with a 2014 commune report citing revenues to the commune at approximately VND 3 billion (USD 150,000) while total expenditures were approximately
VND 8 billion (USD 400,000). The commune depended on VND 5 billion (USD 250,000) from the district government to cover regular expenditures.

Benefits from mining operations in Phuoc Duc commune have helped the surrounding regions. Investment in roads and bridges have helped Phuoc Son district in general, as these improvements have reduced the government’s budget burden. Interviews with district employees indicated that the budget for development investment in Phuoc Son in 2013 was approximately VND 105 billion (USD 4.7 million) for twelve communes. It could be argued that direct investment from the mining company in Phuoc Duc, may have allowed the rerouting of budgets allocated by the regional government to other communes.

5.5.1.5. Economic activity

Similar to Phuoc Duc, Tam Lanh’s economy has benefited from forward and backward linkages. However, these linkages have resulted in a number of issues including debts to service providers, pollution and job loss when the mine is closed. By contrast, Tam An’s economy did not receive such benefits, but local families were active in economic diversification. Statistics for Tam An indicated that whilst one village had 197 households receiving the majority of income from agriculture, 34% had at least one person working as a brick layer, brick layer’s assistant, household worker, babysitter or carpenter. This diversification had increased opportunities for people in Tam An and has helped mitigate shocks that are highly dependent upon the mining sector.

Contributions from mining revenue have created an ‘additive economy’ in Phuoc Duc commune. Due to a large tax debt (207/TB-VPCP/2016), mining operations in Phuoc Son (and Bong Mieu) were stopped by the Quang Nam Tax Department (Besra, 2014). This closure resulted in financial issues for Phuoc Duc. Interviews indicated that in 2012 and 2013, for
instance, environmental fees for Phuoc Duc were approximately VND 1 billion (USD 500,000) and VND 5 billion (USD 250,000). When mining operations were stopped in July of 2014, environmental fees dropped to approximately VND 0.3 billion (USD 15,000) and by 2015 income was zero. In addition, a representative of the Phuoc Duc authority stated that “development investment has been impacted recently due to a substantial drop in tax contributions (only 3%) in 2014”.

5.5.2. Social implications

5.5.2.1. Corporate Social Responsibility (CSR)

Whilst Phuoc Nang has not directly benefited from CSR initiatives, CSR projects have focused on development in Phuoc Duc (Appendix 5.7). Authorities’ indicated that in 2012 and 2013, ‘the company’ supported approximately USD 21,400 in upgrades to the local water system for irrigation and repaired and upgraded equipment for the Community House in Village 4. In addition, in collaboration with the East Meets West Foundation, a clean drinking water project valued at USD 200,000 provided potable water to more than 300 households adjacent to the mine. The company also provided supplies for the library, computers for the local secondary school and meeting tables and chairs for patients at the local clinic.

Similarly, a number of direct benefits from CSR initiatives were reported for Tam Lanh commune (Appendix 5.8). As confirmed by interviewees, company accounts show that between 2006 and 2012, approximately VND 12 billion (USD 600,000) was spent on such activities. Aside from infrastructure development, CSR initiatives included individual household repair, direct household support, contributions to education and health care and agricultural investment. Interviews indicated that VND 360 million (USD 180,000) was donated to support animal husbandry and VND 300 million (USD 150,000) to build a
kindergarten. In collaboration with the NGO World Vision, a water treatment plant was built in 2007 providing clean drinking water to over 451 families in Villages 8, 9 and 10.

5.5.2.2. Conflicts

Despite CSR investment, tensions between local residents in Phuoc Duc and the mine, particularly Village 4, still exist. According to villagers, conflicts have arisen from waste water discharge in the local river, mine related dust, restricted employment opportunities and poor mine management. Consequently, protests by local residents blocked buses delivering workers to the mine. More specifically, from July 2011 to July 2014, there were four protests where company buses were blocked, with the most serious in May of 2013 resulting in a five day work stoppage. The protesters blocked access to and from the mine and the company had to hire a helicopter to transport food, water and essential items for miners inside the blockade. It should be noted, that there was no violence against the miners and these conflicts were dealt with peacefully and without injury or police involvement.

Similar to Phuoc Son mine, tension between Bong Mieu mine and Tam Lanh residents is an ongoing challenge. The most serious incident occurred in August 2010 when several thousand residents blocked access roads to the mine protesting the transportation of quarried material from Phuoc Son to Bong Mieu for processing. Residents argued that “quarried materials have to be processed at the location of extraction”. “We do not accept the transport of quarried material to other places because it will create additional pollution” one interviewee responded. The conflict lasted two days and resulted in a number of injuries. Again in 2005, tensions between local residents and company security led to a night time attack on company assets by 500 individuals. The group destroyed property valued at USD 200,000 and stole raw quarry materials and other valuable items. Several people were caught and one person was sentenced to two years in prison.
In the context of Phuoc Son, although some economic growth has resulted from mining activities, development of forward and backward linkages has actually burdened local communities. For instance, 6666 has been blamed for creating additional pollution and as one interviewee highlighted “the 6666 company has discharged waste water without treatment, but we do not have evidence for this”. In addition, local service providers (LSPs) including food retailers, hotels, fuel distributors and transport enterprises have charged the company with withholding payments. Local papers have reported that food providers and transport companies were owed up to VND 220 million (USD 10,000) and VND 20 billion (USD 1 million), respectively (Son, 2013). These debts have impacted livelihoods and fuelled local retaliations (e.g. on December 2013, hundreds of sub-contractors destroyed Phuoc Son’s mine gate and requested payment).

5.5.2.3. Unemployment

An extended period of closure of the Phuoc Son mine also occurred from July 2014 to August 2016 proving difficult for employees and their families in both Phuoc Duc and Phuoc Nang (Besra, 2014, 2016b). As mentioned previously, due to tax debt, the mining company’s operations were suspended at Phuoc Son resulting in hundreds of layoffs. In the interim, local miners had to seek alternative livelihoods including fishing, farming and freelance work. Some took to artisan mining and illegal logging resulting in further environmental degradation. Due to dependencies on the mine, interviewees in Phuoc Duc indicated that livelihoods were unstable and they preferred to work for the company when production resumed. One woman stated that “she wants the company’s production to resume so her husband can continue working”. The closure adversely affected income but it is unclear the extent to which poverty rates were influenced in Phuoc Duc as 2015/16 figures had not been released at time this manuscript was written. However, a commune staff member stated that “the poverty rate in
Phuoc Duc is likely to be alarming”. It should be noted that during the mine’s closure, Phuoc Duc was significantly affected in comparison to Phuoc Nang as three times as many residents were employed in the mine.

One of the greatest problems facing Phuoc Nang commune (non-mining) is unemployment. Interviewees indicated that women had no work for up to 10 days per month and men were without work for 3-7 days. During unemployment periods they often looked for short-term fixes, however, in Phuoc Nang more than 60 percent of households were identified as poor and demand for labour locally is limited. It should be noted that unemployment is a problem for the whole Phuoc Nang community, not just the miners laid off by the company.

Indeed, unemployment was also a problem in Phuoc Duc, but not as problematic as in Phuoc Nang. In Phuoc Duc, only those livelihoods dependent on collecting rocks to extract gold were concerned with unemployment as these activities were not allowed on the mines lease during stoppages. In contrast, the majority of those interviewed in Phuoc Duc did not complain of unemployment.

High unemployment in Phuoc Nang, particularly men, may have had an impact on the conservation of surrounding natural resources and exacerbated socio-economic issues. Women interviewees indicated that among unemployed men, only a small proportion agreed to look for work or participate in household activities; with the majority interested in hunting and drinking. During conversations with one group of women (15), a group of intoxicated young men (5) tried to interfere in the discussion. Similarly, the village head in Phuoc Nang was found to be intoxicated during a meeting at the commune office (2 pm) and another village head could not take part in a morning interview due to stomach pains from the previous nights drinking.
An additional consequence of drinking is family violence. Although this was not identified as a serious issue in Phuoc Nang, during one interview, a deputy chairwoman identified that the Phuoc Nang Women’s Association was instrumental in reducing family violence and spousal separations, particularly in Village 1.

Unemployment during mine closures has also caused problems for communities in Tam Lanh. Similar to Bong Mieu mine, tax debt resulted in the suspension of production for 6 months in 2014 and 3 months in 2015. In accordance with notice 156/TB-UBND/05-05-2017 of QNPC, the company’s license had not been extended past March 2016 and there are questions concerning the mines future viability. These closures have resulted in work interruption for local miners requiring employees to seek alternative livelihoods. During closures (and similar to Phuoc Duc), some locals engage in artisan mining and illegal logging however, income generated from these activities was deemed unstable and employees sought re-employment in the mine when operations commenced. Field observations identified that mine closures in Tam Lanh did not affect unemployment in Tam An. In fact, according to labour reports for 2013 and 2014, the proportion of people regularly working in Tam An was 90% and 92%, respectively.

However, out-migration was high in Tam An as statistics indicated that in 2013 and 2014, approximately 600 people or 14% of the labour force had immigrated to other districts for work. Many people in Tam An, especially young married men, migrate seasonally for work in other regions. Remittances therefore helped Tam An households through income accumulation, providing access to quality seed, enhancing social and economic networks and increasing knowledge transfer of farming practices.
One of the biggest problems in Tam An was that people, particularly young single men, were not interested in farming. Interviewees highlighted that working in agriculture was difficult and resulted in low income. As socio-economic development has created more pressures on young people to enjoy life, without economic mobility, agriculture was seen as a poor option. Therefore, young people without vocational or university education preferred to leave their villages to look for outside opportunities. Interviewees indicated that even experienced farmers did not want to work in agriculture due to perceived impacts on health and limited economic opportunity. This sentiment may explain why there is considerable out-migration in Tam An.

5.5.2.4. Antisocial behaviour

In terms of antisocial behaviours and their consequences, district statistical accounts indicated that drug addiction and HIV infection were a problem, but more so in Phuoc Duc than Phuoc Nang (PSGSO, 2015). For instance, in Phuoc Duc, the number of heroin addicts and HIV infections managed by authorities were 7 and 21, respectively. These are high numbers given the geographic isolation of Phuoc Duc. On the contrary, no drug addiction was reported in Phuoc Nang and the number of people testing positive for HIV was 6. Indeed, interviewees blamed mining activities for attracting drug dealers to the area with a view that this in turn fuelled drug addiction. Similarly, community members felt that as a result of increased immigration to the area and the antisocial behaviour that accompanied mining activities, HIV infections had increased.

In Tam Lanh, safety and crime was raised as a concern. Interviewees identified that the number of young people addicted to heroin has risen; over 50 in Tam Lanh alone. At a recent village meeting, it was reported that 19 villagers had tested positive for heroin use and the perception was that the problem is attributed to mining (Nguyen et al., 2018). In addition, gaming has been increasingly reported as a problem. Indeed, field observations during this research revealed...
young men playing cards during working hours in local cafés as a reasonably widespread activity. Interviewees indicated that stealing and fighting had increased in the region and blamed mining for the situation.

In Tam An, interviews and field observations revealed that drug addiction (2 cases) and HIV infection (1 case) were not a problem. In addition, reports from the police office showed that the commune had limited concerns regarding crimes or drug dealing and most interviewees were grateful for the safety situation in their communities.

5.5.3. Environmental effects
5.5.3.1. Pollution and health

The biggest distress to the environment in Phuoc Duc was water pollution, as interviewees felt that rivers and aquifers had been contaminated by mining activities (Nguyen et al., 2018). Interviewees and environmental reports indicated that Daksa, the main river in the region, has been heavily polluted and mining activities were blamed for contamination. According to a more recent Environmental Impact Assessment (EIA) report (PSGC, 2010), 137 m$^3$ of water per day was used during the gold fraction stage (5.73 m$^3$ per hour), with wastewater containing a cyanide concentration of 1,000-2,000 mg per litre; along with other heavy metals. Moreover, residual tailings of 5,043 m$^3$ per year containing cyanide were being produced on site. Causing significant concern is the plants upstream location as discharge has been blamed for health issues downstream (PSGC, 2010).

Similarly, water pollution was also one of the biggest concerns in Tam Lanh commune (Nguyen et al., 2018). The Bong Mieu River, the largest in the region, has been heavily polluted by mining operations. One interviewee living along the river for several decades identified that
the river used to be a good place for fishing and swimming and supported agricultural practices however, in the last decade it had earned the moniker ‘dead river’.

According to an EIA report, processed waste water was discharged into the river at an average rate of 2,151 m$^3$ per day, of which 24 m$^3$ contained cyanide at a concentration of 3-5 mg per litre. From an environmental perspective, treated and untreated waste water was being discharged directly into the river upstream of communities that rely on the river for agricultural production. In addition, air quality was a concern in Tam Lanh, particularly odours, dust and noise. A number of interviewees highlighted that irritating smells were frequently discharged from the Bong Mieu gold plant (usually after 10 pm) and according to EIA reports, 138,200 kilograms of explosives are used annually. This generates dust, noise and a number of dangerous gases such as CO$_2$, CO, SO$_2$, NO and NO$_2$. Finally, mining related traffic on local roads often exceeds the national noise standard 3-8 dB(A). With the majority of households located along main roads, home life is often disrupted during daytime hours.

Consequently, health impacts are a significant concern in Phuoc Duc particularly from contaminated drinking water (Nguyen et al., 2018). Interviewees identified that “local people are concerned and angry with the company. Pollution has permeated the soil and rain water brings pollution into the river”. Indeed, many people in the mining villages have witnessed health impacts; resulting in death in some instances. For example, due to contact with contaminated river water, dermatological and gynaecological issues have been cited by locals. In addition, it was identified by interviewees that ten cows had died after drinking water from the river and after a recent flood event; both banks of the stream were covered with tailings, destroying rice crops.
Likewise, local residents in Tam Lanh commune were concerned about health impacts (Nguyen et al., 2018). Interviewees indicated that in 2003 they were using water from the Bong Mieu River for animal husbandry, but during field visits in October 2015, community members had stopped using water from the river for irrigation and watering of livestock. For mining adjacent communities such as Villages 8, 9 and 10, residents no longer drank water from wells due to contamination and several interviewees blamed the recent rise in morbidity on mine related pollution.

In Tam Lanh, local people were most recently concerned with the 60 tons of cyanide bought by the mining company for gold production. Due to mismanagement, it was identified that the cyanide was counterfeit (15.012.01-GDTM/N2 and 15.013.01-GDTM/N2) and not stored appropriately causing the local authorities to be contacted. Interviewees indicated that local people were concerned with the lack of transparency, but also the haphazard approach to dealing with chemicals. For instance, the company suggested that 20 tons of the counterfeit cyanide could be used in local construction while the remaining cyanide could remain in company stores for later use (464-15/BGM-PSGC), a suggestion ultimately rejected by the authorities.

In Phuoc Nang, although drinking water was not as contaminated as in Phuoc Duc, water quality was a concern for interviewees. People in Village 3, 4 and 5 using streams from nearby mountains complained that agricultural practices upstream was polluting water downstream. However, this issue did not seem to be mine related and other interviewees identified that the water quality in the mountains was still good. By contrast, people in Village 1 and 2 who used water from wells expressed concerned that the water smelled. In addition, Villages 1 and 2 had limited alternative water sources.
In Tam An, drinking water was not a concern and authorities had a feasible plan to connect households who lived along the DT 615 road and the national highway to a drinking water system in Tam Ky city. However, soil and surface water in the region might be polluted by intensifying use of insecticides and herbicides in the last few decades, though this is only speculation. Field observations identified that although the Tam An authority had a program for collecting used insecticide and herbicide containers, locals were still concerned with soil and water contamination. Indeed, local people understood the hazardous nature of these chemicals, but in the context of rural life, economic gain through agriculture is paramount to sustaining livelihoods.

5.5.3.2. Land allocation and conservation

The ability of the mining company to manage its leases has been a concern of community members and local government officials. Steven and Fulton (2008) reported that the mining company was granted exploration rights (1953 and 1955 QD/DCKS) in 1998 by the Ministry of Industry for 100 km² of forested land in Phuoc Duc. In 2003, a second license (2355/GP) was granted by the Ministry of Planning and Investment decreasing land available for exploitation to 70 km² and in 2008, this area was further reduced by the Ministry of Natural Resources to 42 km² (07/GT-BTNMT). The reason for reducing the company’s lease, as identified by interviewees, was a perceived inability to manage these lands, which had been impacted by conversion to agriculture, illegal logging and artisanal mining.

In Tam Lanh, a slightly different trajectory has occurred. Based on a 1991 license (140/GP), 3,000 hectares were granted for company operations and by 1992 (582/CNNg-KTM), another 358 hectares were released for exploration. By June 2006, notice 513/TB-UBND issued by the Quang Nam People’s Committee (QNPC) approved exploration within forested lands set aside for protection (blocks 590 and 591) and as a result, 2,282 hectares of protected forests were
opened for production (48/2007/QD-UBND). Finally, in 2008 (2125/GP-BTNMT), an additional 26.3 hectares were added to the company’s lease.

Similar to Phuoc Duc however, interviewees argued that the land allocated to the mining company, was too large for the mine to manage. One interviewee suggested that “it may not be the right decisions to allocate a very large area of forested land to the mining company whilst it does not have the capability to limit exploitation and manage the land. This has created pressures on local authorities regarding forest protection”. Indeed, the protection and management of forests have been charged as ineffective and have resulted in clearing for agriculture, artisanal mining and illegal logging.

As for non-mining communities, one of the biggest environmental concerns was resource exhaustion. Interviewees in Phuoc Nang identified three key issues: limited arable land, poor quality of adjacent forests from extensive clearing in the late 1970s and early 1980s and wildlife depletion from overfishing and trapping. Through the interview process, it was identified that limited agricultural land existed for young couples recently married or separated from their parents. In addition, the clear cutting of several thousand hectares of Song Thanh Natural Reserve and allocation of portions of the Reserve for production may exacerbate a precarious environmental situation.

In Tam An, residents were also concerned with soil degradation. Some areas of arable land along the Suoi Can stream in An My were covered by sand after recent flooding and could not be cultivated. Fertile agricultural soil had been eroded by flooding, degrading the landscape and reducing soil quality. Weather extremes, flooding and inappropriate human activities have exacerbated soil management in Tam An.
5.6. Conclusions

Overall, the findings presented in this paper suggest that mining has contributed to more economic development opportunities in Phuoc Duc and Tam Lanh communes than in non-mining regions (Phuoc Nang and Tam An). However, extractive operations have also been acknowledged as key drivers of environmental degradation and social upheaval. In both mining locations, tensions between local residents and the ‘company’ are omnipresent. Although the ‘company’ has endeavoured to support local communities, it is apparent that they have failed to sway popular opinion with distrust and animosity over water contamination, air pollution, unemployment, health impacts and livelihood uncertainty pervasive.

Unfortunately, CSR initiatives have not been perceived as meeting community expectations of ‘social responsibility’ which supports a growing body of literature calling for alternative approaches to fostering local support for mining activities (MMSD, 2002c, Hamann, 2003, Owen and Kemp, 2013). In the communities we examined, CSR initiatives were not deemed as sufficient by the local communities due to perceptions of uneven benefit sharing. However, expectations from local communities may not be realistic and as Garvin et al. (2009) have found, local residents often feel a need to be patronised and when patronisation does not meet expectations, local communities can “find themselves betrayed, cast aside and disconnected from the processes of development and modernity” (Ferguson, 1999, p.236). According to ILO (1989), the World Bank (2005) and the UN (2007), consistent consultation with local communities can help alleviate some of these tensions but in the case of Phuoc Duc and Tam Lanh, consultation between local residents and the mining company were limited at best and when they did occur, were found to me ineffective (04/11-01-2010, 02/11-01-2010, 366/CV-UBND/30-11-2009).
Mining related economic development and diversification in Phuoc Duc and Tam Lanh was also perceived as inadequate, contributing to malaise for the mining company. According to Robbins (2013, p.166), “mining companies can often be resistant to deepening their engagement with local or national economic processes beyond the bare minimum”. Within the context of this research, it was found that tax payments from mining operations in Phuoc Duc and Tam Lanh were perceived as having a significant benefit in promoting community development. However, local service providers, government departments and residents alike became reliant on commerce, tax receipts and employment opportunities. Resource dependence can become apparent when mine closures occur and money stops flowing.

For non-mining communities (Phuoc Nang and Tam An), benefits from mining were not direct but some spillover was identified. Ironically, because there was less reliance on mining to support livelihoods, one could argue that these communities were better off, particularly in Tam An (but not without mining related environmental impacts). In fact, Phuoc Nang and Tam An benefitted from some increased economic activity, however, because mining was not the primary economic driver, livelihoods remained diversified mitigating economic shocks such as a mine closure. Junod et al. (2018) refer to this region as the ‘Goldilocks Zone’ where, in this example, Phuoc Nang and Tam An (non-mining regions) were close enough to obtain benefit from economic spillover, but far enough away to avoid substantially negative environmental and social impacts.

More recently, a complicated mix of tax debt, local discontent and failed negotiations between Besra and government stakeholders (207/TB-VPCP/29/07/2016) resulted in the shutdown of production at both Bong Mieu and Phuoc Son by the Quang Nam authorities (18 July 2014 and 22 July 2014 respectively). The mining company has complained that these actions were illegal and a direct result of coercive measures conducted by the provincial Quang Nam Tax
Department (Besra, 2014). After two years of suspension, the Phuoc Son mine was permitted to reopen on 17 August 2016 (Besra, 2016b) however, by 1 September 2016, Quang Nam People’s Committee informed the mining company that they would not support the reinstatement of their operating license (document 4227/UBND-KTN). On 19 July 2016, the Ministry of Natural Resource and Environment requested Bong Mieu mine stop operations completely (2910 BTNMT-DCKS) and on 30 June 2017, Besra announced that it had completely divested from all interests in Vietnam (Besra, 2017a).

Although Besra’s mining operations have ceased and the company has completely divested from Vietnam (Besra, 2017a), the negative impacts on the community and the region as a whole will live on. Interestingly, even with local sentiments of malaise, interviewees commenting on the recent mine closures indicated that “it is good for the commune if the company recommences its operations”. Some local commune staff also argued that without the mining company, it was impossible for mining authorities to manage artisanal mining. However, in the context of Phuoc Duc and Tam Lanh, while economic development may be perceived as positive, social concerns, tension between locals and the company and environmental degradation may usurp positive sentiment.

This mirrors findings from Africa where mining has supported economic growth, but local welfare has seen little improvement (Chuhan-Pole et al., 2017). In fact, mining has been seen to increase inequality in some cases (Addison et al., 2017), but when poverty reduction does occur, it may be much slower than in non-mining regions or the rest of the developing world for that matter (Campbell and Akabzaa, 2009, Chuhan-Pole et al., 2017). In fact, while mining is still considered a major driver of growth, the distribution of social and economic benefits is often concentration in cities rather than in the regions from which the resources were extracted (World Bank, 1996 and Kemp et al., 2011).
In Phuoc Duc and Tam Lanh, mining contributions to the local economy and social setting has been mixed with the real beneficiaries being the provincial and district governments. Tax receipts bolstered local coffers when the mines were in operation and district government representatives identified that the company helped manage artisanal mining and illegal logging on their lease. Ironically, local community members did not communicate the same sentiment, citing mismanagement and exploitation of leased lands by the company.

In conclusion, relations between mining companies and local residents are complicated, nuanced and context specific. However, the role of mining companies in promoting long-term socio-economic development needs to be re-examined specifically in association with promoting wellbeing and the needs of local communities. Transparency of operations and direct consultation with local people needs to be enhanced overall and the benefit of mining in a particular location should be independently reviewed before operations commence. Findings from initial environmental assessments can provide fundamental baselines and pave the way for evidence-based strategies to enhance development and promote a positive experience for both local communities and the mining industry as a whole.

Prologue

This chapter is the last of four linked pieces of research comprising this thesis. This paper has been submitted for review in the journal *Environmental Policy and Planning*. The main aim of the chapter was to examine Vietnam’s mining regulations and recent reforms with regard to attracting foreign direct investment. This chapter identifies the key components of a modern mining regulatory framework, and examines the extent to which the Vietnamese context reflects these characteristics.

The results indicate that although recent reforms have been required to maintain competitive advantage and improve management of the extractive industry, weaknesses still exist including the domination of State-owned enterprises, high taxes, corruption, environmental degradation and the increased vulnerability of local mining communities. However, addressing weakness in the current regulatory framework can help pave the way for sustainable growth of the mining industry far into the future.
Abstract

This paper aims to identify the key components of a modern mining regulatory framework, and examines the extent to which the Vietnamese context reflects these characteristics. In addition, through two research locations in Vietnam- Phuoc Son and Bong Mieu- the paper investigates how national policy operates at a local level. Findings show that over the past decade or so, the Vietnamese Government has initiated substantial reforms to the regulatory frameworks governing mining, with the central objective being to attract foreign direct investment (FDI) to underpin the expansion of extractive industries. However, it has become apparent that these reforms have numerous deficiencies and loopholes that have led to a range of unintended economic, social and environmental consequences. These include complexity and inconsistency, lack of transparency, particularly in licensing, corruption, high taxes, environmental protection and societal impacts. Findings also indicate that in the near future, regulatory reforms relating to the extractive industry are likely to cope with numerous challenges including rent-seeking, incapability of Government staff, failure of institutions and negligible important roles of local communities. Therefore, besides weaknesses discussed above, policy makers think differently and strategically about characteristics of the mining industry and comprehensive regional plans. These may help substantial progress in regulatory reforms and harmonise the extractive sector and economic development in the future.
6.1. Introduction

It has been long been acknowledged that the regulatory frameworks governing extractive industries in developing countries need to continue to move towards underpinning the principles of sustainability in mining (Bastida, 2002). Social scientists and international development organisations such as the World Bank (1992, 1996a) have long worked to improve governing frameworks to attract more investments in the mining sector, particularly in the developing world (Campbell et al., 2004, Campbell, 2010). At the same time, however, they have also focused on the need to enhancing dimensions of sustainable development such as maximising livelihoods, reducing poverty and inequality, improving social conditions and ensuring ecological conditions (Bastida, 2002).

In the Vietnamese context, mining has played a crucial role in the country’s recent economic development. According to the General Statistics Office (GSO, 2014c), the sector accounted for approximately 11% of Gross Domestic Product in 2014. However, conflict over revenues, social upheaval and environmental degradation have all been ascribed to the industry by various stakeholders (Nguyen et al., 2018). As such, the Government has faced challenges in not only appeasing commercial mining interests, but also other interest groups, including local communities and environmental stakeholders (Nguyen et al., 2017).

In the past decade, regulatory governing the mining in Vietnam have been substantially reformed, in large part with a focus on creating an investment and operating environment that makes the country competitive internationally. These regulations provide guidelines that aim to balance foreign investment and the flows of public sector revenue streams through royalties and taxation (Fong-Sam, 2010).
There are, however, numerous deficiencies in the regulatory frameworks designed to regulate the industry (MONRE et al., 2017). Indeed, Murfitt (2009) and MONRE et al. (2017) suggest that the regulations themselves are overly complicated and difficult to understand. Lack of cooperation between agencies has resulted in inconsistencies in how these regulations are interpreted and applied (Dau et al., 2017), and high levels of taxation have resulted as Government agencies work to ‘safeguard’ their piece of the revenue pie (Binh, 2009). Moreover, the legal frameworks currently in place are biased towards State-owned enterprises (SOEs) (World Bank, 2011) with numerous legal loopholes, lack of transparency, and often a disregard for local communities (Tran et al., 2012). In order to reform this system however, guidance in the form of a modern regulatory framework [or Modern Mining code (MMc)] is required to direct the process and ensure fair, transparent, and sustainable outcomes from mining (Onorato et al., 1998). Yet, there remain critical questions concerning the essential characteristics of an MMc, the extent to which Vietnam’s current mining regulations adhere to such a code.

To address these questions, this paper identifies the key components of a modern mining regulatory framework, and examines the extent to which the Vietnamese context reflects these characteristics. In addition, the paper considers two locations in Vietnam - Phuoc Son and Bong Mieu - as a means of examining how national policy operates at a local level. To this end, the paper first provides an overview of regulations governing mining operations Vietnam. Next, the results of an examination of the extent to which current regulations adhere to the principles of a MMc is presented. The paper then provides an overview of how national policy has (or has not) been enacted in the two case study locations. Particular attention is paid to the extent to which aspects of a MMC are applied, violated and enforced on the ground. Finally, the paper reflects on the nature of regulatory shortcomings in Vietnam, and offers suggestions how to improve it.
6.2. Mining legislation reform: A brief review

Over the last century, mining regulations in developing nations have focused on enhancing state control of resource revenues or operational independence of the private sector (Bourgouin, 2011). According to the World Bank (2003a), early reform of mining regulations that occurred between the 1940s and 1970s were concerned largely with limiting the power of private mining firms and concentrating control of natural resources with the state. However, reform during this period tended to lose sight of other critical issues, including resource rents, job generation, technological transfer, and socio-economic development (Bourgouin, 2011).

In the 1980s, global economic liberalisation and a preference for a more market-oriented approach to development refocused mining regulations to order to emphasise national and territorial economic growth. This was especially evident in African and Latin America (Bastida, 2002). For example, throughout the 1980s and 1990s the majority of African leaders became increasingly concerned with redressing weaknesses in mining production in order to harness benefits for socio-economic development (Bourgouin, 2011). At the time, the International Monetary Fund (IMF, 1983) called for the reform of mining policies that emphasised foreign investment and open market access. According to Biersteker (1990), this was also encouraged by the World Bank, and indeed was a prerequisite for monetary support.

The focus during the 1980s and 1990s on reducing state control of mining activities was also driven by the interests of corporate resource firms (Bourgouin, 2011). They argued that limiting state control would promote investment, increasing job creation and unlock economic growth (World Bank, 1992, 1996). Investors sought regulatory reforms that would secure mining rights to outside investors, create certainty for the industry, and reduce ‘meddling’ by the state in private sector activities (Biersteker, Conral et al., 1990).
During the 1990s, the World Bank recommended regulatory reform based on four principles: i) the development of transparent regulatory frameworks that were underpinned by legal certainty; ii) the enhancement of economic and fiscal policies that enhance investment and competitiveness, iii) the enactment of institutional reform that support foreign activity and provide legal protections; and iv) development of laws limiting environmental impacts (Campbell et al., 2004, World Bank, 1992). Central to these principles was an effort to provide investors with regimes that supported contract stability, guaranteed fiscal regimes, profit repatriation, and access to foreign exchanges (Campbell et al., 2004, Campbell, 2010).

Private firms also highlighted mineral tax policy reform as a prerequisite for increasing FDI. High state induced costs, including the payment of mineral royalties, income taxes, company tax and in some cases turnover taxes all presented risks to profits (Conral et al., 1990, Sunley and Baunsgaard, 2001). Of course, the danger of high costs and an excessive regulatory burden is that resource companies fail either to invest or redirect their activities to other more ‘investor friendly’ countries. In Ghana for instance, important investment in the mining industry was lost to Tanzania, Guinea and Mali due to liberal governance and ‘mining friendly’ policies in those countries (Akabzaa, 2009a). This led to increasing competition amongst developing countries to secure resource industry investment, and contributed to the drive for regulatory reform.

Whilst fiscal control over mining operations was increasingly moving in the favour of private investment during the 1990s, debates concerning resource (and indeed economic) sovereignty, social needs and environmental protection continued (e.g. Thomas and Maier, 1990, Pring et al., 1999). The emergence of the ‘sustainable development’ agenda in the 1980s (see Brundland Report (WCED, 1987b)) called for economic growth whilst maintaining environmental
resources for future generations (Pring et al., 1999). Although mining operations are locally focused, environmental impacts are transboundary or global in nature. In an attempt to provide some protection for developing nations, the ‘Berlin Guidelines’, jointly authored by the UN and German Foundation for International Development in 1991, identified that mining is important for socio-economic growth, but at the same time requires laws to insure protection of the environment (Wälde, 1992). In particular, the guidelines highlighted that sustainable mining practices required appropriate environmental management from extraction to reclamation (Wälde, 1992).

To ensure that environmental protection was achieved, environmental impact assessments (EIA) became a widespread practice for mining projects by the early 1993 (Pring et al., 1999). In recognising the social implications of mining, this was gradually extended to include social impact assessments (SIA) (Mitchell, 2012). Essentially, EIA (including SIA) has been widely adopted and become an effective and flexible tool to identify the extent to which mining projects meet sustainable development conditions (Pring et al., 1999). Further, EIA is typically a prerequisite for financial assistance and project approval. Indeed, by the end of 2011, 191 countries have either embedded EIA in national legislation or agreed to adherence to international standards (Morgan, 2012).

Following a global push for enhanced environmental controls, mining regulation reform turned to the rights of Indigenous populations (UN, 2007, Barrera-Hernández, 2016). In 1998, the Aarhus Convention mandated that Governments commit to local people’s right to information and involvement in the decision-making processes in relation to resource projects (UNECE, 1998). The right to free, prior, and informed consent (FPIC) championed by the United Nation
argued that Indigenous peoples had land rights that were often usurped by Governments for the benefit of mining operations (Barrera-Hernández, 2016).

Furthermore, the unequal distribution of the economic and social benefits of mining is commonly cited by critics of extractive industries (e.g. Christian Aid, 2004, Kemp et al., 2011). The central argument is that there is often concentration of the public benefits in cities rather than in resource regions (World Bank, 1996b). In addition, although being contentious, benefits are likely to accrue to extractive companies’ profits and a numerous people who are directly engaged with the mining industries such as management or service providers (e.g. Knierzinger, 2014, de los Reyes, 2017). In contrast, social and environmental costs become the burden of local communities (e.g. Campbell and Akabzaa, 2009, Chuhan-Pole et al., 2017). To this end, the United Nation Human Rights (UNHR, 2013) group has heralded FPIC as an important instrument for Indigenous peoples’ self-determination. This is, in turn, backed by the International Labour Organisation 169 (ILO, 1989) and the United Nations Declaration on the Rights of Indigenous People 2007 (UNDRIP) (UN, 2007).

In 2003, the Extractive Industries Transparency Initiative (EITI) has also emerged and been realised as a new movement advocating for further mining legislative reform and a global standard to improve the transparency and accountability of Government management practice through collaboration with private companies and civil society (Rustad et al., 2017). To date, 51 countries have implemented EITI and 31 nations are compliant with EITI requirements (EITI, 2016).

Collectively, the initiatives outlined above have coalesced around what might be considered a ‘Modern Mining code’. However, little focus has been paid to the extent to which national, state and local Governments put these principles into practice within modern mining regulatory
frameworks. This is particularly important at a local level given that a number of scholars have suggested that the greatest social and environmental impacts of mining are on local communities (e.g. Ali, 2004, Bebbington et al., 2008, Kemp et al., 2010, Banks, 2016). This paper examines the extent to which two case study communities, Phuoc Son and Bong Mieu, are governed by what might be considered a Modern Mining code (MMc). By using the MMc as a suite of principles, we examine the extent to which these regulations are applied, violated and enforced in these two study communities whilst drawing some generalisations as to why failures of regulatory compliance arise and what might be done to reform the current policy landscape.

6.3. Methods
6.3.1. Study area

This study draws on two extensive case studies of gold mining operations in Phuoc Duc commune, Phuoc Son district, and Tam Lanh commune, Phu Ninh district, Quang Nam province, Vietnam. Gold exploration and subsequent mining operations in Phuoc Son began in 1997 with the case study mine located at Phuoc Duc commune. The mine, operated by the Canadian firm Besra, is situated in a remote area consisting of a population of 2,400, of which more than 60% are Indigenous and 50% were living below the poverty level (2014 census figures). Bong Mieu mine, located in Tam Lanh commune, Phu Ninh district is also operated by Besra with exploration and subsequent production beginning in 1997. The region is mountainous and contains a population of 6,708 (0.5% Indigenous) with approximately four per cent living below the poverty level (2014 census figures). Livelihoods of local villagers in both mining communes are based on agriculture, commercial afforestation and mining activities.
6.3.2. Towards a Modern Mining Code

According to Campbell et al. (2004), Campbell and Akabzaa (2009), in the period from the mid 1980s to the early 2000s, African nations in particular experienced three phases of mining sector liberalisation. The first emerged in the mid-1980s which specifically called for greater foreign direct investment (FDI) and market-led development. The second phase emerged in the early to mid-1990s and was marked by the recognition of the importance of social and environmental regulations. The phase occurred from the end of the 1990s and coincided with the World Bank’s call for modern reform to the regulatory frameworks governing the mining sector, but again focused on FDI. In this instance however, controversial reforms such as tax revenue and benefits sharing were enacted revealing a number of operational shortcomings highlighting the need for a modern code of practice (Besada and Martin, 2015).

The notion of a ‘Modern Mining code’ (MMc) was introduced by the World Bank (1992) with the central objective of providing an ethical framework for large-scale private investment in resource industries. At the time, three principles were championed: (i) the right of investors to explore for new mineral deposits; (ii) the ability to secure long-term titles to mining rights; (iii) the need for sustainable and ethical practices in mining (World Bank, 1992). At the forefront of reform were mining strategies first developed for Latin America and the Caribbean in 1996, where new regulations addressed issues such as access to mineral rights and economic security (World Bank, 1996). Similarly, in 1998, the World Bank expanded what had been established for Latin America, highlighting that meaningful MMcs should emphasise transparency, stability in institutional arrangements, investment certainty, and fiscal responsibility. In turn, mining companies should support increased consultation with affected people about mitigation negative social, economic and environmental impacts, increased local employment opportunities, and land ownership rights (Onorato et al., 1998).
This call for reform by the World Bank was partially reflected in the ‘fourth generation’ of mining governance codes. This saw a greater emphasis placed on the notion of Corporate Social Responsibility (CSR), and in particular transparency and accountability of both host nations and companies (Sagebien and Lindsay, 2011). These ‘fourth generation’ codes, varied considerably but are currently reflected in the practices of some of the most notable global mining governing bodies including the Extractive Industries Transparency Initiative, the Global Mining Initiative and the International Council on Mining (Besada and Martin, 2015).

The principle features of ‘fourth generation’ mining codes have now been adopted by extractive enterprises, national Governments and a broad range of stakeholder organisations (Besada and Martin, 2015). By drawing on guidance from the World Bank and relevant literature, these features can be organised into 10 main categories ranging from the establishment of an appropriate legal framework to providing for positive environmental and social conditions (Table 6.12).

**Table 6.12: Summary of the Essential Elements of a MMc**

<table>
<thead>
<tr>
<th>Components</th>
<th>Measurement of Indicators</th>
</tr>
</thead>
</table>
| Legal framework | - Clarity and consistency across legislation requiring minimal discretion, and coordination with other legislation.  
- Legislation is equally applied to all investors, without distinguishing between public and private investors, or their origin.  
- Provide long-term security of tenure (20-30 years for exploitation with renewal) with a clear path for transition between exploration and extraction licensing.  
- Guarantee of minimum work commitments in exchange for investment stability. |
| Economic and fiscal policy | - Policy promotes good macroeconomic policy and governance.  
- Companies are allowed access to foreign exchange funds.  
- A focus on profit-based taxes over royalty taxes, export taxes or import duties, to decrease operating losses. |
| Institutional reforms | - The Government takes responsibility for organising and supervising the privatisation of state-controlled mining companies.  
- Elimination of political pressure on private management practices, allowing the freedom to hire and fire and maintain contacts with the outside world.  
- Establishing and enforcing realistic environment, health and safety regulations.  
- Regulation of artisanal mining. |
| Corporate Social Responsibility (CSR) and participation of affected people | - Regulate stakeholders to engage in the translation natural resource endowments into wealth, economic development and social empowerment.  
- Adopting CSR codes as a supplement to national regulatory schemes.  
- Provide a mechanism for arbitration of impacts to local people.  
- Normalise the use of free, prior and informed consent (FPIC) |
<table>
<thead>
<tr>
<th>Access to mining activities</th>
<th>- Address Indigenous rights and resettlement issues.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Identification of mining rights and exclusion areas.</td>
</tr>
<tr>
<td></td>
<td>- Specification of conversion rights from exploration to development including renewal rights and any relinquishment obligations.</td>
</tr>
<tr>
<td></td>
<td>- Provide for prospecting rights guarantees which are not covered by existing exploration or development rights to encourage discoveries.</td>
</tr>
<tr>
<td>Ongoing obligations</td>
<td>- Obligations of the mining company should be clearly specified concerning compliance with the terms of its mining license and prescribe to international best practice.</td>
</tr>
<tr>
<td></td>
<td>- Provide Force Majeure relief and approaches for companies to remedy shortcomings in their performance (with arbitration as necessary).</td>
</tr>
<tr>
<td>Regulatory aspects</td>
<td>- Stipulate the rights of regulatory authorities to access, inspection and issue directions.</td>
</tr>
<tr>
<td></td>
<td>- Provide sufficient powers to regulatory bodies to ensure mine safety and observance of proper practices.</td>
</tr>
<tr>
<td>Ancillary licenses and permits</td>
<td>- Legislation should clearly identify the rights afforded to the operator in relation to land and natural resource use.</td>
</tr>
<tr>
<td>Investment contracts</td>
<td>- Provide an opportunity to modify or supersede the mining law as appropriate through an investment agreement.</td>
</tr>
<tr>
<td>Environmental and Social matters</td>
<td>- Mining projects must be assessed and monitored to limit environmental impacts and must observe an agreed plan to mitigate environmental damage.</td>
</tr>
<tr>
<td></td>
<td>- Measures to safeguard the environment, and health and safety should be incorporated in legislation.</td>
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<tr>
<td></td>
<td>- Compliance incentives provided tax deductions.</td>
</tr>
</tbody>
</table>


6.3.3. Measuring MMc adherence

The adoption and specific characteristics of a MMc has varied considerably across nations however, though as Table 6.12 emphasises a number of common themes are apparent (Onorato et al., 1998, Campbell, 2010). These common elements provide a framework for understanding how resource firms operate within countries, and in particular at the local level. In broad terms, it is possible to identify the key ingredients of a MMc at these spatial scales. In the case of Vietnam, we draw on the two case study communities (Phuoc Son and Bong Mieu) to examine the extent to which modern mining regulations have been interpreted, applied, enforced and in some cases breached ‘on the ground’. To this end, content analysis was first employed to understand the extent to which Vietnam’s mining regulations reflect a MMc. This included a detailed assessment of key legal documents (such as the 2010 Mineral Law), regulatory frameworks, policy documents and specific mining agreements. In addition, a total of 307 structured and semi-structured interviews were conducted on a face to face basis with local
community members, miners, management of the mining company, and Government officials. These interviews explored a range of themes, including how mining regulations are developed and interpreted, their implementation at national and local levels, the engagement of stakeholders in the regulatory process, and strengths and weaknesses in the regulatory frameworks.

6.4. Results

Table 6.13 provides an overview of the results of a critical analysis of Vietnam’s mining regulations. Vietnam’s regulatory framework provides a number of protections for mining companies including long-term security of tenure, commitments to exchange, and a guarantee to privatise state owned assets and secure mining rights. In terms of Corporate Social Responsibility, policies address health and safety regulations as well as resettlement issues; however, there are a number of areas where the nation’s regulatory framework lacks transparency, is overly complicated, and/or constrains a company’s ability to operate efficiently. These results are explored more fully in the following sub-sections.

Table 6.13: Summary of the Essential Elements of a MMc with a critical analysis of Vietnam’s mining regulations

<table>
<thead>
<tr>
<th>MMc category</th>
<th>MMc element</th>
<th>Achievements and deficiencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Legal framework</td>
<td>1.1. Clarity, constancy, minimal discretion and coordination</td>
<td>- Overly complicated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Difficult to understand</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Policy inconsistencies</td>
</tr>
<tr>
<td></td>
<td>1.2. Applying equally to all investors</td>
<td>- Priorities and privileges to SOEs and related-SOEs</td>
</tr>
<tr>
<td></td>
<td>1.3. Long-term security of tenure</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>1.4. Guarantee of commitments in exchange</td>
<td>✓</td>
</tr>
<tr>
<td>2. Economic and fiscal policy</td>
<td>2.1. Promote good macroeconomic policy and governance</td>
<td>- Inconsistent mining regulations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Illogical economic policies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Prevalence of corruption</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Ineffective management</td>
</tr>
<tr>
<td></td>
<td>2.2. Foreign exchange access</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>2.3. Focusing on earning-based taxes and decrease operating losses</td>
<td>- Does not identify natural resource tax for a specific mineral</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- High taxes</td>
</tr>
<tr>
<td>3. Institutional reforms and infrastructure</td>
<td>3.1. Responsibility of Government for privatisation of SOEs</td>
<td>Tax calculated by volume and quality of ores</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>------------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>3.2. Elimination of political pressure</td>
<td>‘Master plans’ created by the Government</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Privileges to SOEs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Numerous Governmental agencies involved with management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bureaucracy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of transparency</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Breaches of licensing process</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Corruption and rent-seeking behaviour</td>
</tr>
<tr>
<td></td>
<td>3.3. Health and safety regulations</td>
<td>Further provisions and clarification required</td>
</tr>
<tr>
<td></td>
<td>3.4. Good infrastructure to address environmental issues</td>
<td>Lack of concern</td>
</tr>
<tr>
<td></td>
<td>3.5. Regulate artisanal mining</td>
<td>Lack of concern</td>
</tr>
<tr>
<td>4. CSR and participation of affected people</td>
<td>4.1. Development and empowerment</td>
<td>Further provisions and clarification required</td>
</tr>
<tr>
<td></td>
<td>4.2. Adopting CSR codes</td>
<td>Lack of concern</td>
</tr>
<tr>
<td></td>
<td>4.3. Arbitration of impacts on local peoples</td>
<td>Unclear and need further clarification</td>
</tr>
<tr>
<td></td>
<td>4.4. Free, prior, informed consent</td>
<td>Lack of concern</td>
</tr>
<tr>
<td></td>
<td>4.5. Address Indigenous issues</td>
<td>Unclear and unsubstantiated concerns</td>
</tr>
<tr>
<td></td>
<td>4.6. Address resettlement issue</td>
<td>Further provisions needed</td>
</tr>
<tr>
<td>5. Access to mining activities</td>
<td>5.1. Mining rights</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.2. Conversion rights</td>
<td></td>
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<tr>
<td></td>
<td>5.3. Prospecting rights</td>
<td></td>
</tr>
<tr>
<td>6. Ongoing obligations</td>
<td>6.1. Compliance by mining company</td>
<td>Increased specificity required</td>
</tr>
<tr>
<td></td>
<td>6.2. Provide Force Majeure</td>
<td>Lack of concern identified in 2010 mining law</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clarification of environmental regulations required</td>
</tr>
<tr>
<td>7. Regulatory aspects</td>
<td>7.1. Stipulate rights of regulatory authority</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.2. Provide sufficient powers to regulatory bodies</td>
<td></td>
</tr>
<tr>
<td>8. Supporting licenses</td>
<td>8.1. Identify rights of resource use</td>
<td></td>
</tr>
<tr>
<td>9. Investment contracts</td>
<td>9.1. Provide opportunities to modify or supersede</td>
<td></td>
</tr>
<tr>
<td>10. Environmental and social matters</td>
<td>10.1. Assessing and monitoring mining projects</td>
<td>Inconsistent management of mining tailings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of responsibility of relevant agencies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Noncompliance by mining companies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reclamation and rehabilitation requirements not met</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inadequate protection of local people’s property rights.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inadequate (low) environmental fee</td>
</tr>
<tr>
<td>#</td>
<td>Incorporating safeguard measures for environment, health and safety</td>
<td>Compliance incentives and tax deductions</td>
</tr>
<tr>
<td>----</td>
<td>---------------------------------------------------------------</td>
<td>----------------------------------------</td>
</tr>
</tbody>
</table>
| 10.2 | - Ineffective collaboration among agencies  
     - Ineffective monitoring of transfer tax revenues  
     - Vulnerabilities to health and livelihoods | - Lack of concerns  
     - Low recruitment of local peoples  
     - Ineffective CSR initiatives |

☑ Indicates Vietnam's legal framework adequately addresses the issue  

### 6.4.1. Complexity and inconsistency in regulations

In the last decade or so, the Vietnamese Government has made substantial reform to mining’s regulatory system. However, it still remains complicated and difficult to interpret (Murfitt, 2009, MONRE et al., 2017). For example, in order to properly apply the ‘Luật Khoáng Sản 2010’ (60/2010/QH12) (herein referred to as the Mineral Law) in practice, a number of additional legal documents including decrees, decisions, circulars, and provincial mineral plans must be considered concurrently in order to accurately interpret how various aspects of the law are operationalised (Appendix 6.10). There have also been issues with the timing of when complementary laws have been released. For instance, a closely related decree 15/2012/ND-CP was not enacted by the Government until nearly a year after the Mineral Law came into effect (NAEC, 2017). Yet, this decree is essential in providing detailed guidelines for several articles of the Mineral Law. In addition, some of the laws and regulations related to the Mineral Law have not been updated or altered subsequent to 2010, whilst others have been adjusted. This has led to inconsistencies in how specific legal requirements interact and confusion in legal interpretation (VUSTA, 2012).

The Mineral Law has also been described as lacking necessary detail and practicality (MONRE, 2015, NAEC, 2017). For example, both MONRE (2015), NAEC (2017) have highlighted that articles 64 (relating to mineral exploitation for general construction material),
65 (relating to mineral exploitation in areas that have construction projects) and 79 (payment and auction for non-probing mineral areas) are insufficient in properly regulating exploration. Similarly, the law does not provide guidance on price estimations of minerals and mines, and proper methods to manage effectively quantifying of volumes and quantity of extracted materials (Vo, 2014).

In the current context, the extractive industries sector is administered by multiple Government agencies, and this has led to inefficient management and a complex bureaucracy that firms and communities are required to navigate (Appendix 6.11) (Nguyen et al., 2015). For instance, Dau et al. (2017) identified that in one instance it took two years for a mining company to attain a exploration license as a result of a complex and inefficient set of approval processes that required involvement from numerous agencies. The inefficiency and complexity of these arrangements have also been noted by the Environment, Technology and Science Commission of the National Assembly, which went on to concede that this slowed the approval process considerably (1642/BC-UBKHCNMT13/20-7-2015). Similarly, the roles and responsibilities of the Central Government and Provincial People Committee’s (PPCs) are not clear, and indeed there is an increasing consensus within Vietnam that it is not clear which agencies have responsibilities for managing the mining industry (VUSTA, 2012). In essence, there is a lack of clarity of how the Minerals Law translates into clear and effective governance and regulatory frameworks.

One of the key weaknesses with the Minerals Law is that it does not seek to reduce the influence of State-owned enterprises (SOEs). Dau et al. (2017) indicated that 53% of mining companies in Vietnam are partially controlled by the State. According to the World Bank (2011), the Vietnam National Coal-Minerals Industries Corporation (Vinacomin), which is 50% State owned, is in direct or indirect control of approximately 95% of Vietnam’s hard-rock mineral
production. In addition, the Chairman and General Director of Vinacomin was appointed by the State (World Bank, 2011) and Vinacomin has had a monopoly on the mineral industry over the last several decades. This is inconsistent with the principles of a MMc in that it limits involvement of private sector enterprise in the resources sector, effectively creating a monopoly over large parts of the extractive sector.

6.4.2. Licensing and transparency

Vietnam’s regulatory framework often lacks the tools to prevent breaches. A report penned by MONRE (3141/BTNMT-PC/15-8/2013) indicated that of the 957 mining licences approved from July 2011 to December 2012, 1086 legal breaches were committed. Noncompliance was also evident at the provincial level (MONRE, 2010), where national policy does not authorise either the District People’s Committees (DPC) or provincial divisions of the Department of Natural Resources and Environment (DNRE) to grant mining licenses. However, investigations have found that both DPCs and DNREs in a number of provinces have authorised licences for small-scale exploration (MONRE, 2010), accounting for more than 50% of the mining licenses issued in 2013 (Tran, 2013).

Furthermore, the issue of transparency has not been addressed adequately within Vietnam’s regulatory framework (Dau et al., 2017). Current policies do not require transparency of the project bidding process, nor do they require that the outcomes of the process be publicised (Dau et al., 2015). Companies have also noted a lack of information available from the Government, including up-to-date maps and land use planning documentation. According to VCCI (2014), 48% of mining companies had to negotiate relationships with Government agencies just to obtain information to facilitate business opportunities. In addition, Dau et al. (2015) identified that a lack of transparency in mining policy was due to the absence of mechanisms for independent monitoring and dialogue between stakeholders. These deficiencies in information
sharing may be attributed to ineffective regulatory enforcement and Government bureaucracy. Indeed, this is reflected in the Resource Governance Index for 2013, which ranked the Vietnamese mining industry 40 out of 58 nations for transparency (RGI, 2013).

6.4.3. Corruption and rent-seeking

A lack of effective mechanisms for preventing corruption is one of the most important concerns within contemporary mining regulatory frameworks (Dau et al., 2017). This is also the case in Vietnam. A recent investigation into Vietnam’s licensing process found that approximately 10% of fees payed to the Government by mining enterprises (MEs) were ‘unofficial’ (Sang and Huy, 2011). In addition, VCCI (2014) found that in 2013, 78% of MEs had to pay bribes to conduct business in the country. This was confirmed by the Government Inspectorate of Vietnam, who identified that unofficial fees range from USD 5000 to 50,000 just for licensing approval (Tuyen, 2011).

Rent-seeking behaviour has also been noted by several scholars (see Dougherty, 2013). This is framed as the ‘concealed benefits’ gained through collaboration between politicians and mining companies. Moreover, such relationships often underpin oligopolistic or monopolistic outcomes within the industry (Chen et al., 2011). According to VUSTA (2012) and Vu (2017), the phenomenon of ‘begged-given’ (2) (cơ chế ‘xin-cho’ in Vietnamese) has been identified in Vietnam where poorly qualified mining enterprises are granted mining licenses in return for a portion of their revenue. Corruption in regard to licensing has also resulted in mining firms operating across the country without appropriate technical and financial capabilities (VUSTA, 2012). Consequently, precious financial and human resources have been wasted due to

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2 ‘Begged-given’ phenomenon may be a result of corruption or rent-seeking behaviour where a company begs a powerful Government official to obtain a mining license without an auction. In many cases, companies may be uncompetitive or unable to comply with legal procedures (Vu 2017)
inefficient extraction processes in locations were rich deposits are easily mined and transported. In addition, numerous problems were associated with these mining firms including environmental pollution, infrastructure degradation and social upheaval (Le, 2014).

6.4.4. Tax regulations

Vietnam’s current mining regulations have resulted in one of the most heavily taxed extractive sectors globally (Murfitt, 2009, Vu, 2017). In June of 2008, the removal of value-added tax (VAT) incentives resulted in mining companies’ inability to process minerals on an economic basis, as VAT refunds were often built into costing models (Binh, 2009). In addition, export tariffs on most ores increased from 5% to 20%, royalty rates increased from 5 to 7% for the majority of minerals, and 6 to 9% for gold (Binh, 2009). The corporate income tax increased from 32 to 52% for projects commencing after January 2009 (Binh, 2009) and by 2016, the Government had increased the natural resource tax by 2% with the addition of several new fees under the guise of environmental protection and exploitation rights (Nam and Bich, 2016).

As Vu (2017) identified, taxes are not consistent within or across various mineral groups. For example, coal is taxed between 4 and 20%, metals between 7 and 25% and non-metals between 3 and 15% (NAEC, 2017). In addition, NAEC (2017) identified that the mineral exploitation tax structures has impacted on how firms operate. Overlaps have been identified between the fees for exploitation rights (FER) (article 77 of the Law), resolution 203/2013/ND-CP, circular 54/2014/BTNMT&BTC and the natural resource tax (NRT) (article 4 of the Natural Resource Tax Law 2009). In essence, FER and NRT are one in the same, but according to law, NRT is regarded as an additional tax (NAEC, 2017).
6.4.5. Environmental Protection

In the past decade, the Government has enacted legislation enhancing environmental protection. This includes Article 3 of the Mineral Law, Article 38 of the Environmental Law (55/2014/QH13), decision 18/2013/QD-TTg, and circular 38/2015/TT-BTNMT. However, resource extraction is still acknowledged as one of the key drivers of environmental degradation (e.g. MONRE, 2011, Nguyen et al., 2018), forest clearing (e.g. Tran, 2000, Manh, 2015), production of mine tailings and other wastes (e.g. MONRE, 2011, VUSTA, 2012) and water pollution in Vietnam (e.g. World Bank, 2011, Bao and Vinh, 2014).

Whilst environmental protection has been recognised as an important legal and policy concern in Vietnam, deficiencies exist in the regulatory framework. For example, MONRE (2011) highlighted that current environmental laws do not clearly stipulate who is responsible for certain aspects of environmental protection. Much of this lies in confusion about the responsibilities of the Ministry of Construction and the Ministry of Commerce. More specifically, inconsistencies in policies regulating the management of solid waste has resulted in two separate organisations being tasked with waste management responsibilities. For example, circular 81/2007/ND-CP identifies that the Provincial Department of Natural Resources and Environment is responsible for environmental protection, including management of solid wastes, yet circular 13/2008/ND-CP states that the Provincial Department of Construction is also responsible for managing solid wastes. To this end, across Vietnam, solid waste is managed by different Government agencies in different provinces and to different standards.

Furthermore, enforcement of environmental regulations is often ineffective in the Vietnam context. According to VUSTA (2012), the management, implementation and monitoring of
particular mines must be stipulated in individual Environmental Impact Assessments (EIAs). Yet, this has proven ineffective. According to the World Bank (2011), since legal frameworks do not provide guidelines for evaluating EIAs, mining companies are likely to prepare insufficient reports addressing only the minimum legal requirements. Furthermore, once operating, mining companies do not always take steps to protect the environment, such as limiting dust, noise and waste (VUSTA, 2012). During a regulatory inspection of Quang Ninh province for example, it was found that only 38 out of 68 coal mines had prepared EIA reports. Moreover, few EIAs were updated when changes in production had occurred, despite the requirement that this occur (World Bank, 2011).

Policies regulating mine reclamation have also been exploited by resource companies. According to decision 71/2008/QD-TTg, mining companies are required to pay a bond for environmental rehabilitation. However, enforcement of these bonds does not always occur and when mines close, funds are often not available for rehabilitation (VUSTA, 2012). A number of Government agencies have also pointed out that it is difficult to manage how bonds are spent as regulations and guidelines are imprecise, confusing and challenging to follow (World Bank, 2011). In addition, fees collected for reclamation are not always sufficient to carry out recovery activities. According to circular 63/2008/ND-CP, mining companies have to pay environmental fees which vary from VND 10,000 (USD 0.5) to VND 180,000 (USD 9) per cubic metre or tonne mined and these fees are often insufficient (World Bank, 2011).

6.4.6. Societal Impacts

According to the circular 74/2011/ND-CP and the Law on the State Budget 2015, mining regions are to receive 100% of the natural resource tax and the environmental fees for socio-economic development and environmental protection. However, it is difficult to determine if
these fees are being appropriated to the mining regions and if they are being used as intended. Dau et al. (2017) identified that, in particular, auditing environmental fee expenditures has been difficult and it is not clear if local people have benefitted from these fees. As for the natural resource tax, in one case it was reported that a mining company had contributed VND 36 billion (USD 1.8 million) in taxes to the Central Government but the region where the company was operating had not seen any of the revenue (Tran et al., 2012).

Property rights, particularly in relation to agricultural land, have not been adequately accounted for either (VUSTA, 2009). For instance, Tran et al. (2012) indicated that results from a study of five different mining sites showed that 188 households had lost a total of 470 ha of agricultural land which adversely affected livelihoods. Local land owners have lost considerable land to mining due to low levels of compensation (50-70% of the market prices) and because they typically lack of political and negotiation skills required to lobby for fair compensation (Tran et al., 2012). To this end, high levels of poverty exists amongst those who have lost their land to mining operations (VUSTA, 2009).

A loophole resulting from deficiencies in the wording of regulations has inadvertently protected mining companies from being required to recruit local labour. The Mineral Law, for instance, legislates that mining companies must ‘prioritise’ the use of local labour. However, the engagement of local people in resource projects has often fallen well below expectations. In the five mining projects examined by Tran et al. (2012), the proportion of local people recruited at each site accounted for between 0.6% and 1.8% of all employees. In addition, many local people were found to be employed as casual workers resulting in low incomes, employment instability, and varying levels and quality of accident and health insurance (Tran et al., 2012).
Mining regulations were also found to be insufficient to cover health impacts on local residents. For example, Tran et al. (2012) noted that 4-5% of the population at one coal mining site were infected with tuberculosis and 60% of a population suffered from bronchitis. In an area near a lead mining project, residents reported dizziness, vomiting, difficulty breathing, chest pain, dermatological issues, high blood pressure, and joint and eye diseases (Lan, 2007). The Mineral Law stipulates that it is the responsibility of mining companies to support local communities in terms of infrastructure development, social welfare and environmental restoration however, this is not monitored ineffectively (MONRE, 2015). Furthermore, when local authorities receive contributions from mining companies, there is little transparency of how it is spent, although the Mineral Law stipulates that contribution expenditures must be declared within provincial budgets (Dau et al., 2017).

Indeed, social impacts of mining are multidimensional and have substantially affected local people’s lives and livelihoods and include concepts such as income generation, employment, land loss, pollution, and health. Explicitly, these issues are closely related to the concepts of employment, property rights and health. However, there have been few studies on the impact of mining in Vietnam therefore, it is challenging to find relevant literature to support this research.

6.5. Mining legislation and at the local level

6.5.1. Environmental protection fee and natural resource tax

While the majority of mining policies are administered by the Central Government, particularly resolutions 02-NQ/TW/2011 and 103/NQ-CP/2011, and decision 2427/QD-TTg/2011, there are provincial policies that also influence operations on the ground. For example, in Quang Nam province, a key piece of legislation add to national policies is the Provincial Standing Committee’s Action Plan (18/CTr/TU/2012). As such, this is the most important piece of
legislation that provided a framework, strategy and vision for the mineral sector between 2020 and 2030.

According to two resolutions of the National Assembly (928/2010/UBTVQH12 and 712/2013/UBTVQH13), taxes on gold should be levied at a rate of 15%. However, based on the Quang Nam People’s Committee’s (QNPC) decision 22/2013/QD-UBND, gold with a purity of 98% is taxed at a rate of VND 1,000,000 (estimated USD 50) per gram. In 2014, this tax was reduced to VND 800,000 (USD 40) based on decision of the QNPC (36/2014/QD-UBND). Therefore, mining companies in the province are paying the provincial tax in associated with the decision 36/2014/QD-UBND.

In terms of environmental protection fees (EPFs), regulations administered by Quang Nam provincial Government aligns closely with that of the Central Government. This is likely to be beneficial for mining companies. According to the Quang Nam People’s Committee’s decision 18/2009/QD-UBND, the EPFs applied to gold ore was set at VND 10,000 (estimated USD 0.5) per ton which was the maximum tax allowed by the Central Government decree 63/2008/ND-CP. Similarly, in resolution 95/2013/NQ-HDND of the Quang Nam province, the EPFs is set at VND 180,000 (USD 9) per ton of ore which is also the minimum levy identified in the Central Government’s decree 74/2011/ND-CP.

It is important to note that the Quang Nam provincial mining policies have been developed with a focus on the needs of the mining regions themselves (Phuoc Son and Phu Ninh). Indeed, there is a clear focus on ensuring that the region receives economic return and that this is not simply centralised. According to decisions 32/2010/QD-UBND and 31/2013/QD-UBND, the districts retain 80% of the environmental protection fees (EPFs) and 100% of taxes levied on extracted resources. Information collected during interviews revealed that taxes from Bong...
Mieu mine accounted for 15% to 20% of Phu Ninh’s revenue from 2010-2013. In 2011 and 2012, Phuoc Son district earned approximately USD 6.5 million from the EPFs and natural resource tax. However, transparency on how these funds were expended is not entirely clear, in particular the extent to which they were used for economic and social development initiatives and environmental recovery.

It is important to recognise that Government taxes, whether official or unofficial, breached or enforced, do not always have the desired effect. In the case of Quang Nam province, due to tax debt and negotiation failures, the Quang Nam authorities has stopped Besra’s mining activities in Bong Mieu and Phuoc Son. First, Quang Nam’s tax department suspended Bong Mieu mine’s operating permit since 18 July 2014 and Phuoc Son mine’s operating permits between 22 July 2014 and 17 August 2016 (Besra, 2014, 2016b). On 1 September 2016, the Quang Nam People’s Committee informed Besra (document 4227/UBND-KTN) that they would not support the reinstatement of their operating licence. On 19 July 2016, Ministry of Natural Resource and Environment (MONRE) sent a document (2910/BTNMT-DCKS) requesting Bong Mieu mine cease operations completely. Finally, as of 30 June 2017, Besra had experienced complete divestment of all its Vietnamese subsidiaries (Besra, 2017a) with the future of the mines in question.

6.5.2. Legislations towards Environmental and Social Matters.

Many mining companies have benefited from land allocation decisions enacted at the provincial level. At the Phuoc Son mine for instance, the company was initially granted over 100 km² for exploration (licenses 1953 and 1955/QD-DKCS/1998) and although these allocations were later reduced (licences 2355/GP/2003 and 67/GP/BNTMT/2008) some of this land was part of a protected forest reserve. Similarly, according to licence 140/GP/1991, Bong
Mieu mine was originally allocated 3,000 hectares for exploration. In 1992, an additional 358 hectares were granted for discovery (582/CNNg-KTM), followed by an additional 36.3 hectares (decision 2125/GP-BTNMT) in 2008.

During field visits, it was found that more than USD 500,000 had been spent by Besra on economic and social development initiatives between 2010 and 2015. However, these initiatives were classified as ‘philanthropic activities’ and not those directly legislated for. In such cases, if funds are transferred directly to the province, no guidance is in place to help local authorities manage these budgets. In addition, whilst Besra has seemingly complied with the notion of free, prior, and informed consent (FPIC) (ILO, 1989, UN, 2007) neither the Mineral Law nor the Environmental Protection Law 2014 directly legislates for the rights of Indigenous people. The mining company in this instance had communicated with local communities through the local People’s Committee (153-09/PSGC/24-09-2009) and, in return, local views were summarised and sent to Besra through two formal letters issued by the People’s Committee (04/11-01-2010) and the Fatherland Front (02/11-01-2010). However, without policies requiring mining companies to respond to local stakeholder feedback, it is unlikely that the FPIC process has resulted in genuine consent.

6.7. Discussion

6.7.1. Regulatory reform and positive outcomes

Overall, mining regulations in Vietnam have been substantially reformed over the past decade (NAEC, 2017). Importantly, the passing of the Mineral Law 2010 has provided a better regulatory framework for managing the nation’s extractive industries. Based on the Mineral Law 2010, numerous under law documents have been enacted including six decrees by the Government, three decisions by the Prime Minister and over 30 circulars (see appendix 6.10).
The implementation of these regulations has increased the effectiveness of governing exploratory activities.

A resource development strategy and forward planning in the mineral resource sector has resulted. For example, decision 2427/QD-TTG/22-12-2011 approved by the Prime Minister, provided a fundamental legal framework for mineral resource planning. According to the Ministry of Trade and Industry (MOTI, 2017), planning to 2020-2025 and the projection of mineral volumes including titanium, bauxite, iron, zinc, coal, copper, gold, nickel to 2030-2035 have been made.

Similarly, geological mapping of mineral resources have been realised as an important section for improving mineral management. For example, decision 1388/QD-TTG/13-08-2013 approved by the Prime Minister highlighted a set of crucial tasks geologic assessment which will provide support for management decision going forward. According to the Ministry of Natural Resources and Environment (MONRE et al., 2017), twenty-four geological mapping projects and mineral evaluations have been completed with more underway. It is anticipated that by 2020, 80% of Vietnam’s inland areas will have undergone geologic resource assessments.

Mineral resource planning and geological mapping have provided foundations for better management and licensing for mineral activities. For example, licences issued to MONRE for 40 minerals were based on geologic resource assessments authorised by the Prime Minister and the Ministry of Trade and Industry. Likewise, licenses approved by the provincial People’s Committees for mineral exploration were based on numerous local detailed geologic resource assessments also approved by higher authorities.
Notably, regulatory reforms have improved budget contribution to the Government at all levels. According to the National Assembly Economic Commission (NAEC, 2017), in the period between 2011 and 2015, natural resource taxes accounted for 1.02% of the State’s revenue. Similarly, fee for obtaining mineral exploration licenses and collection expenditures on mineral exploration and probe have substantially contributed to the State’s budget. For example, as soon as decree 203/2013/ND-CP came into effect in 2013, the average annual return from licensing has ranged from USD 180,000 to 227,000 (MONRE et al., 2017). These financial contributions have become important for funding further mineral exploration.

6.7.2. Limitations of the regulatory system

In Vietnam, there is a complex and extensive regulatory framework in place to provide oversight to the mining industry. However, the nature and extent of regulatory compliance, particularly in the two mining regions discussed in this study, remains a concern (Dau et al., 2017, MOTI, 2017). Indeed, a substantial gap between policy development and implementation appears to exist based on the documentary evidence (Dau et al., 2017). However, a more focused assessment at the local level does provide insight into these regulatory gaps and the nuances therein.

As identified in this paper, corruption and rent-seeking behaviour remains a major concern and substantial obstacles for companies trying to comply with the present regulatory frameworks. In 2017, according to Transparency International (TI, 2017), Vietnam was ranked 107 out of 180 nations in their Corruption Perceptions Index. This was confirmed in a more recent study in 2017, that found 44.6% of FDI enterprises had paid informal fees with the cost of unofficial charges accounting for 31.3% of annual income (Malesky et al., 2018). According to Weinthal and Luong (2006), this high level of corruption is a result of weak institutions, poor management, delays in economic reform and distortion of the economy.
In terms of the regulations that are in place, Government officials have limited capacity, time, and resources to detect and deter mining companies from breaching regulations. In terms of taxation, particularly environmental protection fees, Government officials do not possess the infrastructure required to monitor the quality of large volumes of ore extraction and mining activity on the ground (PanNature and Oxfam, 2017). This provides an opportunities for mining companies to report the extraction of smaller volumes and low quality ore to constrain taxation requirements (Dau et al., 2017). Similarly, Government officials lack the capacity and policies to determine the real profits earned by mining companies. From, 2010-2014, for example, profits reported by mining companies had decreased by 2014 (GSO, 2016) however, Vietnam Provincial Competitiveness Index (PCI) indicated that mining enterprises were engaging in a process of expansion due to high profit expectations (Dau et al., 2017).

The unevenness and complexity in how regulations have been implemented on the ground has led to difficulties for a single mining company that operates multiple sites and projects. For instance, for the Bong Mieu mine, the natural resource tax (NRT) was set at 3%, and the corporate income tax (CIT) at 18%, and its products were eligible for trading on the domestic market. In contrast, the Phuoc Son mine was imposed a NRT of 15% and a CIT of 40%, and its products could only be exported (PanNature and Oxfam, 2017). As both mines belong to Besra, there is speculation that gold is being transferred from one mine to another to avoid high taxation rates and increase access to the domestic market (PanNature and Oxfam, 2017).

The weak institutional environment, particularly in terms of individual responsibility, has also undermined regulatory frameworks. It is often the case that mine management, bureaucrats and political leaders have rarely been punished, charged or dismissed due to poor management, regulatory breaches or corruption. Instead, the notion of ‘collective responsibility’ was
typically highlighted, although this often led to cultures of ‘no-responsibility’ (Vu et al., 2015). A financial audit report of Vinacomin (2017), for instance, indicated that total debt of the State-owned Coal-Mineral Corporation on 31/12/2016 was more than VND 100,000 billion (estimated USD 5 billion), but no members of the senior management were charged or held to account with regards to this debt. Similarly, although the tax debt accumulated by the two gold mines in Quang Nam in May 2016 was VND 430 billion (estimated USD 21 million) (207/TB-VPCP/29/07/2016), there have yet to be any individuals held responsible for the debt.

Importantly, the roles of local people in the mining regions, particularly regarding monitoring and participation, were not fully appreciated by the relevant authorities and regulators. In Phuoc Son mine, without the diligence of local people, the illegal discharge of untreated waste water into a main stream by the mining company would not have been discovered (Besra, 2013). Similarly, without protests by the Bong Mieu people, transporting gold ore from Phuoc Son to Bong Mieu for processing could not be easily brought to an end. However, field observations suggested that active participation and voices of local communities were not seriously taken into consideration. Therefore, tensions between local people and mining companies was evident in both locations as a part of protesting regulatory breaches of the mining company.

Although weaknesses and loopholes in Vietnam’s mining regulations are apparent (MONRE et al., 2017), there are continuing challenges for reform. Indeed, regulations are complicated and fragmented (1642/BC-UBKHCNMT13/14/08/2015) and collaboration between Government agencies is ineffective (Dau et al., 2017). These matters, in the first instance, have been realised as major constraints for regulatory reform of the mining industry.
6.7.3. Future considerations

Taxes imposed on minerals in Vietnam have been controversial. Murfitt (2009) and Vu (2017) argued that taxes applied to the mining industry have been large compared to those in other nations. According to the Ministry of Finance (MOF) (Chung, 2009) (Chung, 2009) (Chung, 2009) (Chung, 2009) however, increasing taxes on natural resources is crucial as previous regulations have been improperly developed to reflect sustainable development and have been inconsistently applied (Chung, 2009). In association with consultation of the MOF, the Committee of the National Assembly has also supported a rise in mineral resource taxes resulting in increased revenue at the national level and better management the natural resource overall (Lan, 2015). In such a context, the concern is whether or not increased taxes has helped the State efficiently and effectively exploit the nation’s resources to increase contribution to the national budget (Chung, 2009). In return, in document No 4949/BTC-CST, the Ministry of Finance confirmed that natural resource taxes have created substantial benefits for the country through effective governance (Huyen, 2017). The jury however, is still out.

Furthermore, it is likely that the “natural resource curse” as a concept, has been ignored by the Vietnamese central government. The principle reason is that few studies examining the relationship between resource-dependence and economic development have been conducted in the SE Asia. In addition, to examine the “resource curse” properly requires a longitudinal analysis with time series data which is not always available (Auty, 1993, Weinthal and Luong, 2006). It is noted that in the Vietnam context, the extractive sector has been acknowledged as an important source for maintaining economic growth as indicated by directive 24/CT-TTg in 2017.
6.8. Conclusion

It is recognised that there has been an international drive to reform the regulatory frameworks governing mining activities the world over with the intent of attracting FDI. As a counter argument, policies must be enacted that protect local populations and natural environments. In the case of Vietnam, recent reforms have been required to maintain competitive advantage and improve management of the extractive industry. However, as identified in this research, the outcome has been a piecemeal of overlapping laws and inconsistent guidance, and those policies that do provide for sound regulation are often exploited by local and/or the national Government and mining companies alike.

Using natural resources responsibly to the benefit of all stakeholders is complex, but a sound regulatory foundation can address the needs of all parties. Despite that the Vietnamese Government has endeavoured to reform regulations, numerous shortcomings still exist (e.g. Dau et al., 2017, MONRE et al., 2017). These include the domination of State-owned enterprises, high taxes, corruption, environmental degradation and the increased vulnerability of local mining communities. In the current Vietnamese context, addressing weakness in the current regulatory framework to help address these issues can help pave the way for sustainable growth of the mining industry far into the future.
Chapter 7: General Discussion and Conclusion

7.1. Summary of research findings

The relationship between mining and development is multi-faceted and difficult to disentangle. Although there is a growing body of literature addressing the topic, there remain a range of complex questions regarding the interaction of mining and development (World Bank, 2002). One of the critical issues is to better understand the extent to which mining in developing nations provides benefit to local communities or presents costs that must be borne by future generations (e.g. World Bank, 2002, Ali, 2011, Gilberthorpe and Hilson, 2016). A number of studies have indicated that local communities in mining regions have endured numerous social-economic and environmental costs resulting from limited operational oversight and the uneven distribution of wealth (e.g. McPhail, 2000, Ali, 2004, Campbell, 2009, Hilson, 2014b). As Rickson et al. (1995) have identified, the burden is placed on local people whose frustrations often rise with a lack of voice, and uneven power dynamics (MMSD, 2002, World Bank, 2003). For resource communities, economic development is often beyond local control and largely determined by external forces such as mining company philosophy, international and national markets, and the whim of central governments (Hackett, 2006, Greco, 2009).

This thesis therefore, has attempted to provide an enhanced understanding of how local communities perceive the costs and benefits from mining. The research focused on two gold mines operating in Phuoc Duc and Tam Lanh communes, Quang Nam province, Vietnam. The research focused on understanding the extent to which mining has impacted socio-economic wellbeing by addressing the following objectives:
- Identifying the impacts of mining on the socio-economic wellbeing of 63 provinces across Vietnam during the period between 2009 and 2014.
- Understanding the distinctive perceptions of local communities regarding the impact of gold mining in Phuoc Duc and Tam Lanh communes, Quang Nam province.
- Investigating differences in socio-economic development and environmental protection between mining and non-mining communes in Quang Nam province.
- Providing a critical appraisal of the regulatory frameworks for governing Vietnam’s mining sector.

These objectives were addressed through a series of papers which, in aggregate, make a significant contribution to contemporary debates concerning the role of mining in facilitating development in developing nations. This contribution was undertaken through an examination of the links between mining and development in the context of sustainable livelihoods and uneven development. Finally, this research provides a potential path forward for Vietnam by highlighting how the nation’s mining regulations and processes fall short of a modern mining code.

This thesis therefore, challenges a simplistic assumption that mining is an important driver of improvements to wellbeing for developing countries (Onorato et al., 1998, World Bank, 1992 and 2003) by highlighting the pattern of impacts on the natural environment and the socio-economic fabric of communities in Quang Nam province and Vietnam as a whole. The first paper (Chapter 3) sets the scene for this work, providing an overview of the Vietnamese national context and examining the relationship between mining and development in the nation’s 63 provinces. The central objective was to examine the extent to which the mining industry contributed to poverty reduction and job creation at a provincial level. Findings indicate that the contribution from mining to national revenues was noticeable, but the role of
mining in enhancing wellbeing at the local level is more nuanced. Through an examination of fluctuations in poverty, income and unemployment between 2009 and 2014 mining may have had some positive impacts on socio-economic wellbeing, but has not necessarily reduced poverty or unemployment, or enhanced income generation.

The second paper (Chapter 4) examined the subjectivities of residents in the gold mining communities’ of Phuoc Duc and Tam Lanh commune, Quang Nam province. The paper highlighted local residents’ lived experiences and perceptions concerning changes to employment opportunities, health and society, reinvestment and the environment. Findings indicated that in Phuoc Duc perceived impacts on the standard of living, livelihoods, health, financial mobility and quality of life were of greatest concern. In Tam Lanh, similar patterns emerged indicating that residents were concerned with crime and safety, health and standard of living. This portion of the research found that whilst there were a number of concerns shared by both communities, perceived differences were driven by factors such as demography, culture, remoteness and mining history. To this end, this paper provides valuable insight for government and policy-makers concerning both positive and negative perceptions of residents in the context of local mining activities operated by international companies.

In the third paper (Chapter 5), data collected in four study communities was used to examine perceived differences in mining impacts on mining and non-mining communities in Phuoc Son district (Phuoc Duc - mining; Phuoc Nang - non-mining) and Phu Ninh district (Tam Lanh - mining; Tam An - non-mining), Quang Nam province. Findings indicated that mining communities have benefited from increased employment opportunities, poverty reduction, some infrastructure improvement, tax contributions and Corporate Social Responsibility (CSR) initiatives. However, it also found that these benefits have often come at a cost to the environment, increased crime and antisocial behaviours, and a reliance on mining as the
primary provider of local livelihoods. These impacts manifested as tensions between local peoples and the mining company.

In contrast, while non-mining communities did not experience a rapid increase in job creation and were not the beneficiaries of CSR initiatives, these communities did benefit from local mining tax revenues resulting in infrastructure development. In addition, non-mining communities were less likely to be affected by environmental degradation and antisocial behaviour, and retained a more diversified economy which proved important in mitigating economic shocks (such as mine closures).

The fourth paper (Chapter 6) provided an overview of the framework (policies, governance and guidance) regulating Vietnam’s mining sectors. The paper examined how Vietnam’s current mining regulations had been reformed to better manage the nations mining sector and attract foreign direct investment (FDI) while identifying flaws in the system. It was identified that weakness result from a range regulatory inconsistency, complicated policies, fragmented oversight and a lack of transparency. To further reform Vietnam’s regulatory framework will require limiting the control of State-owned enterprises (SOEs), decreasing corruption and enhancing the transparency of national and regional governance to reduce environmental degradation and build resilience in local communities.

7.2. Considerations for Policy-makers

7.2.1. Wellbeing of local communities

Improving the wellbeing is of broad concern in most societies, but it is particularly critical for rural communities in developing nations (e.g. Rigg, 2006, Gautam and Andersen, 2016). In Chapter 3, it was suggested that benefit sharing for local mining communities, particularly
Indigenous communities in the Central Highlands and the Northern mountainous regions of Vietnam, was unlikely to be sufficient. Inequality in socio-economic wellbeing between the local Indigenous populations and the Kinh people in the lowlands has widened significantly, and as a result, Indigenous people, especially in mining communities have had to endure unequal access to education, health care, employment and off-farm opportunities in general.

Although Vietnam has made significantly advancements in reducing poverty over the past few decades, many challenges still exist (Kozel, 2014), and it is apparent that these issues are not at the forefront of regional development agendas. For example, the socio-economic development plans for the Northern mountainous provinces (1064/QD-TTg/2013) and the Central Highlands (1194/QD-TTg/2014) identify a goal of increasing mining sector activities while communicating little concern for the wellbeing of local communities. Similarly, a review of provincial level development plans in the upland region including Dak Nong province (decision 1942/QD-TTg/2013) and Lao Cai province (plan 212/KH-UBND/2016), yielded little detail concerning how these strategies would improve the socio-economic wellbeing of marginalised populations.

Similar to findings of the World Bank (2012), this research has shown that within the study region, the gap is greatest between Indigenous populations and communities in the low lands (Kinh people). This variability in socio-economic wellbeing can be attributed to inequalities in access to education, health care and public services, low levels of infrastructure development, and limited economic opportunities. Therefore, at the very least, regional planning and/or mining development strategies should address improvements in socio-economic wellbeing in local communities, particularly where Indigenous and/or marginalised populations comprise the majority of the demographic.
7.2.2. Resource dependence

One of the key differences between mining and non-mining communities highlighted by this research is the extent to which mining communities are dependent on the industry to support livelihoods (Phuoc Duc and Tam Lanh). This phenomenon became evidently when the two case study mines closed. From the government perspective, tax revenues were lost, but from the perspective of local residents, many lost their jobs including those in supporting industries. The extent to which the local community relied on mining became painfully clear.

Conversely, non-mining communes were not impacted to the same extent and these local economies have continued to show stable growth. The research presented here indicates that economic diversification was one of the key drivers for positive economic growth in non-mining communities, particular in Tam An. In addition, non-mining regions were seen to fall within the ‘Goldilocks Zone’ (Junod et al., 2018), close enough to attain advantages from economic spillovers, but far enough away to avoid negative environmental and social impacts.

In the context of Quang Nam province, benefits from gold mining activities played an important role in terms of tax contribution, job creation and infrastructure improvement but also fostered a dependence on the mine. Therefore, reducing reliance on mining while extracting (pardon the pun) the maximum benefit, requires sound policies to help mining communities overcome short-term and long-term difficulties. Indeed, economic diversification of non-mining communities and the ‘new rural program’ has resulted in positive contributions to socio-economic development however the latter has been funded by mining related tax contributions.
7.2.3. Regulations

Most importantly, mining communities (and particularly those primarily comprised of Indigenous people) should be appropriately protected and empowered by policy at the local and national levels. The local experiences reported in this thesis should be held as a reference for resource-led development policies. This research indicates that local communities have suffered from pollution due to the mining activities, especially in the context of potable water and human health. In reality, these impacts can be attributed to weak law enforcement, and limited local input. In fact, consultation with local people, through the process of free, prior, and informed consent (FPIC), proved ineffective in this instance. As a result, tension between local communities and the mining company and should be held as an example of how lack of regulatory enforcement and community consultation can result in a negative outcome.

As this research shows, there is variability in the extent to which mining communities and surrounding regions have been impacted. A strong Environmental Impact Assessment (EIA) process should identify these issues before mining operations even begin. However, in the Vietnam context, EIA reporting is likely to comply with minimum standards at best (World Bank, 2011) and mining companies often fail to take actions necessary to protect the local environment (VUSTA, 2012). Therefore, at the very least, increasing EIA standards, as well as monitoring and oversight protocols would potentially result in greater protection for the environment and reduce impacts on local communities.

Environmental protection and mine reclamation are also an important consideration and research findings indicate that environmental degradation has caused negative externalities and tensions between local communities and the mining company. In the case studies presented in this research, the negative consequences from the mines closures are yet to be realised but
during field visits, little evidence of/or discussion concerning reclamation was evident and the extent to which the few regulations that do exist will be policed is questionable.

Due to dynamism of the global economic structure and high variability in mining led development, regulations should be able to cope with the unpredictable nature of the industry including economic recession, commodity volatility, rapidly changing technology and shifting political views. As a result, considered and regular reforms to any nation’s regulatory framework is likely the best approach to maximising benefits and minimising adverse effects.

7.3. Final Thoughts

Overall, this research has provided an in-depth examination of the impacts gold mining has had on the environment and socio-economic fabric of Quang Nam province, Vietnam. Results indicate that although mining has provided some benefits to the region, on the whole, negative effects outweigh the positive much of which may not be realised until long after the mining company has closed its doors and gone home. The local communities that have become dependent on these operations are often bled of life sustaining natural resources and left with little economic opportunity and a degraded environment.

To some extent, the implementation of CSR initiatives by the mining company has caused concern. Findings from this research indicate that although the mining company has spent millions of dollars on CSR, the majority of local residents have not supported extraction operations. The main reason is that they do not perceive their lives better than before mining activities began.
Similarly, approaches to obtain SLO and FPIC by the mining company needs further investigation. Indeed, the company has complied with the Vietnam’s regulations to obtain consensus from local people through the current political system. However, eliciting participation of local people, particularly Indigenous people, in the consultation process has been less effective. Consequently, it is unlikely that the company was actually successful in obtaining SLO and FPIC in Phuoc Duc and Tam Lanh communes.

Objectively, political institutions have been effective in requiring SLO and FPIC. In the Vietnam context, participation through a bottom-up approach is unfamiliar and so any involvement by local communities can be seen as an improvement to the process. In this case, the mining company has adopted FPIC guidance in both Phuoc Duc and Tam Lanh, and communicated their intentions through formal communications (153-09/PSGC/24-09-2009) with the People’s Committee and the Fatherland Front (04/11-01-2010, 02/11-01-2010, 366/CV-UBND/30-11-2009). In this instance, the Fatherland Front was tasked with representing the local people, but the communities did not truly know of, or participate in, decisions relating to their socio-economic wellbeing. Therefore, transparency was questionable, and tensions ensued. From the outside however, this approach could be seen as a failure.

Yet, the long-term future of the environment and socio-economic wellbeing of local communities in mining regions remain unanswered questions. After disagreeing to extend operating licenses for Besra company, Quang Nam People’s Committee has not disclosed any plans regarding Bong Mieu and Phuoc Son gold mines. In contrast, Besra announced that the company obtained an agreement to sell all of its existing interests in Vietnam to a new corporate entity to be established by former in-country senior management (Besra, 2017b). Therefore, it
is likely that both these gold mines will be re-opened and managed by a foreign company in coming months. Although opening plans are unpredictable, it is expected that Quang Nam authorities have learned numerous lessons that ought to enhance management capability. Ultimately, it will be critical that any new arrangements better comply with the regulatory and policy environment and, in particular, community expectations and aspirations.

In light of the Sustainable Development Goals, whether to open the door to extractive industries or not has challenged governments and policy-makers. Balancing environmental protection and socio-economic development has always been difficult and due to the financial constraints of local governments, allocating funds to support development in remote regions has been not been prioritised in Vietnam. Mining therefore, is viewed as a relatively effortless way to contribute to rural development and increase revenues for the Federal government. Reflecting on this research as a whole, mining has provided opportunities for development at the local level but the results are uneven and have not occurred without cost.

While this research addresses the objectives set forth in the Introduction, because it is pioneering in the area of mining and development in Vietnam, it raises a number of questions for future research. These include:

1 What is the future of the mining industry in Vietnam?
2 What were the real drivers resulting in the closure of the Quang Nam gold mines and what are the lasting impacts?
3 To what extent is the “resource curse” reflected in Vietnam’s mining industry and how has this affected local communities?
4 What are the impacts of the bauxite extraction and aluminium process projects in the Central Highlands of Vietnam and to what extent are these processes similar to that of the Quang Nam experience?

5 How are geo-political processes such as foreign direct investment (FDI) influencing Vietnam’s mining industry particularly as China attempts to assert its dominance around the world?

With that said, this research provides a fundamental framework on which future studies can be based building on concepts such as the resource curse, sustainable livelihoods, sustainable development, global volatility of mineral prices and institutional reforms. The outcome of future research will provide for the development of a body of work and evidence providing and enhanced understandings of the complicated relationship between mining and development in Vietnam.


BAO, G. & VINH, M. 2014. 20.000m$3 nước, bùn tràn ra ngoài. Tuoiitre online.


DFID 1999. SUSTAINABLE LIVELIHOODS GUIDANCE SHEETS. UK: Department for International Development.


EITI 2016. Fact Sheet. Extractive Industries Transparency Initiative


180
HORSLEY, J., PROUT, S., TONTS, M. & ALI, S. H. 2015a. A case study utilising the Sustainable Livelihoods Framework (SLF) and Q-Sort Methodology in Zambia and Ghana. first draft, unpublished


IFC. 2018. Mining [Online].


IMF 2009. Vietnam; 2008 Article IV Consultation: Staff Report; Staff Supplement and Statement; Public Information Notice on the Executive Board Discussion; and Statement by the Executive Director for Vietnam. St. Louis: Federal Reserve Bank of St Louis.


LE, A. T. Băn về kết quả thực hiện Luật khoáng sản 2010. Đánh giá 5 năm thực hiện chủ trương chính sách và pháp luật về khoáng sản, 2017 Hà Nội. MONRE.


TOWNSLEY, P. 1996. Rapid rural appraisal, participatory rural appraisal and aquaculture. FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS.


YIN, R. K. 2014. *Case study research: design and methods*, Los Angeles, SAGE.


### Appendix 4.1: A list of 25 indicators taken from the Rapid Assessment Framework for Mining and Development and the SLA ‘capital’ each represents (Tonts et al., 2013)

<table>
<thead>
<tr>
<th>Statements</th>
<th>Indicator</th>
<th>Capital</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drinking water quality</td>
<td>NC</td>
<td>Measures the presence of heavy metals (type and quantity) present in drinking water sources.</td>
</tr>
<tr>
<td>2</td>
<td>Road access</td>
<td>PC</td>
<td>Measures the number and quality of paved roads in mining communities.</td>
</tr>
<tr>
<td>3</td>
<td>Government spending on local education</td>
<td>PC</td>
<td>Measures proportion of the national education budget that is spent locally.</td>
</tr>
<tr>
<td>4</td>
<td>Total arable land</td>
<td>NC</td>
<td>Measures the amount of agricultural land lost, gained, or changed through mining activities.</td>
</tr>
<tr>
<td>5</td>
<td>Cost of living</td>
<td>FC</td>
<td>Measures the change in cost of basic food and non-food items such as charcoal, soap, water, electricity, education, health, and transport.</td>
</tr>
<tr>
<td>6</td>
<td>Perceptions of government corruption</td>
<td>SC</td>
<td>Measures how well the government and/or local leaders manage the costs and benefits of mining operations.</td>
</tr>
<tr>
<td>7</td>
<td>Infant mortality rate</td>
<td>HC</td>
<td>Measures the number of children (per 1000) who die before the age of five.</td>
</tr>
<tr>
<td>8</td>
<td>Adult literacy rates</td>
<td>HC</td>
<td>Measures the proportion of adults (over the age of 15) who can read and write in the official language of the country.</td>
</tr>
<tr>
<td>9</td>
<td>Cultural continuity</td>
<td>SC</td>
<td>Measures transmission of local cultural knowledge, customs, events, etc.</td>
</tr>
<tr>
<td>10</td>
<td>School participation rates</td>
<td>HC</td>
<td>Measures the number primary and high school enrolments as a proportion of the school-aged population size.</td>
</tr>
<tr>
<td>11</td>
<td>Unemployment rates</td>
<td>FC</td>
<td>Measures the overall gain or loss of livelihoods in mining communities taking into account the number of farmers displaced from their land by mining.</td>
</tr>
<tr>
<td>12</td>
<td>Morbidity by major health category</td>
<td>HC</td>
<td>Measures the proportion of the local population affected by the following health problems: HIV/AIDS; malaria; respiratory diseases; accidents; metals/minerals poisoning.</td>
</tr>
<tr>
<td>13</td>
<td>Forward linkages</td>
<td>FC</td>
<td>Measures the number of secondary industries established to process mining output prior to export.</td>
</tr>
<tr>
<td>14</td>
<td>Perceptions of safety and crime</td>
<td>SC</td>
<td>Measures perceptions whether communities near the mine are becoming more or less safe.</td>
</tr>
<tr>
<td>15</td>
<td>Household income</td>
<td>FC</td>
<td>Measures the total income of each household including income from the local ‘informal’ economy.</td>
</tr>
<tr>
<td>16</td>
<td>Perceptions of mining company</td>
<td>SC</td>
<td>Measures the perceptions of people involved in, or affected by, mining about how ethical mining companies are in the way they operate within the country.</td>
</tr>
<tr>
<td>17</td>
<td>Post-school qualification</td>
<td>HC</td>
<td>Measures the prevalence, type and sector of training and education received outside of primary and high school, amongst the community.</td>
</tr>
<tr>
<td>18</td>
<td>Displaced peoples</td>
<td>SC</td>
<td>Measures the number of people forced to relocate because of mining activity.</td>
</tr>
<tr>
<td>19</td>
<td>Land tenure security</td>
<td>NC</td>
<td>Measures perceptions of local community about how confident they feel about their rights to be self-determining with regard to their land.</td>
</tr>
<tr>
<td>20</td>
<td>Access to and quality of energy supply</td>
<td>PC</td>
<td>Measures the proportion of households in the mining community with access to a reliable and affordable source of energy in the form of electricity, coal, or firewood.</td>
</tr>
<tr>
<td>21</td>
<td>Biodiversity/access to natural</td>
<td>NC</td>
<td>Measures levels of access to, and health of, natural resources such as forests, fish, and other food sources.</td>
</tr>
<tr>
<td></td>
<td>resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Government spending on local health</td>
<td>PC</td>
<td>Measures proportion of the national health budget that is spent locally.</td>
</tr>
<tr>
<td>23</td>
<td>Health access</td>
<td>PC</td>
<td>Measures the number of doctors per 1000 people.</td>
</tr>
<tr>
<td>24</td>
<td>Air quality</td>
<td>NC</td>
<td>Measures the amount and nature of emissions and poisonous gases present in the air within proximity of a mine-site.</td>
</tr>
<tr>
<td>25</td>
<td>Backward linkages</td>
<td>FC</td>
<td>Measures the number of local businesses used by mining companies to support their operations.</td>
</tr>
</tbody>
</table>

**NC:** Natural capital, **HC:** Human capital, **FC:** Financial capital, **PC:** Physical capital, **SC:** Social capital
### Appendix 4.2: Factor arrays of the five factors representing perceptions of Phuoc Duc commune residents.

<table>
<thead>
<tr>
<th>Statements</th>
<th>Indicators</th>
<th>fsc_f1</th>
<th>fsc_f2</th>
<th>fsc_f3</th>
<th>fsc_f4</th>
<th>fsc_f5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stat_1 Drinking water quality</td>
<td></td>
<td>4*</td>
<td>2*</td>
<td>4*</td>
<td>2*</td>
<td>4*</td>
</tr>
<tr>
<td>Stat_2 Road access</td>
<td></td>
<td>3*</td>
<td>-1</td>
<td>2*</td>
<td>0</td>
<td>-3*</td>
</tr>
<tr>
<td>Stat_3 Government spending on local education</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2*</td>
<td>0</td>
<td>-1</td>
</tr>
<tr>
<td>Stat_4 Total arable land</td>
<td></td>
<td>1*</td>
<td>3*</td>
<td>-4*</td>
<td>-2</td>
<td>-2*</td>
</tr>
<tr>
<td>Stat_5 Cost of living</td>
<td></td>
<td>1*</td>
<td>-2*</td>
<td>-2*</td>
<td>3*</td>
<td>0</td>
</tr>
<tr>
<td>Stat_6 Perceptions of government corruption</td>
<td></td>
<td>-4*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-3*</td>
</tr>
<tr>
<td>Stat_7 Infant mortality rate</td>
<td></td>
<td>0</td>
<td>0</td>
<td>-3*</td>
<td>-2</td>
<td>3*</td>
</tr>
<tr>
<td>Stat_8 Adult literacy rates</td>
<td></td>
<td>-1</td>
<td>1</td>
<td>-2*</td>
<td>0</td>
<td>2*</td>
</tr>
<tr>
<td>Stat_9 Cultural continuity</td>
<td></td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Stat_10 School participation rates</td>
<td></td>
<td>-2*</td>
<td>2</td>
<td>1*</td>
<td>2*</td>
<td>-1</td>
</tr>
<tr>
<td>Stat_11 Unemployment rates</td>
<td></td>
<td>1*</td>
<td>4*</td>
<td>1</td>
<td>4*</td>
<td>-1</td>
</tr>
<tr>
<td>Stat_12 Morbidity by major health category</td>
<td></td>
<td>-1*</td>
<td>2*</td>
<td>-2*</td>
<td>1</td>
<td>1*</td>
</tr>
<tr>
<td>Stat_13 Forward linkages</td>
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<td>-1*</td>
<td>-3</td>
<td>0</td>
<td>1</td>
<td>-4*</td>
</tr>
<tr>
<td>Stat_14 Perceptions of safety and crime</td>
<td></td>
<td>-2*</td>
<td>0</td>
<td>2*</td>
<td>1</td>
<td>-1*</td>
</tr>
<tr>
<td>Stat_15 Household income</td>
<td></td>
<td>2*</td>
<td>-1</td>
<td>-1</td>
<td>3*</td>
<td>2*</td>
</tr>
<tr>
<td>Stat_16 Perceptions of mining company transparency</td>
<td></td>
<td>-1</td>
<td>-4*</td>
<td>-1</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Stat_17 Post-school qualification</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-1*</td>
<td>-2</td>
</tr>
<tr>
<td>Stat_18 Displaced peoples</td>
<td></td>
<td>0</td>
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<td>-1*</td>
<td>-3*</td>
<td>0</td>
</tr>
<tr>
<td>Stat_19 Land tenure security</td>
<td></td>
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<td>3*</td>
<td>-1*</td>
<td>-3*</td>
<td>0</td>
</tr>
<tr>
<td>Stat_20 Access to and quality of energy supply</td>
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<td>-3*</td>
<td>-1</td>
<td>-3*</td>
<td>-4*</td>
<td>1</td>
</tr>
<tr>
<td>Stat_21 Biodiversity/access to natural resources</td>
<td></td>
<td>-2*</td>
<td>0</td>
<td>0</td>
<td>-1*</td>
<td>-2*</td>
</tr>
<tr>
<td>Stat_22 Government spending on local health</td>
<td></td>
<td>1</td>
<td>1*</td>
<td>3*</td>
<td>-1</td>
<td>1</td>
</tr>
<tr>
<td>Stat_23 Health access</td>
<td></td>
<td>3*</td>
<td>-2*</td>
<td>1*</td>
<td>-1</td>
<td>2*</td>
</tr>
<tr>
<td>Stat_24 Air quality</td>
<td></td>
<td>2*</td>
<td>-2*</td>
<td>3*</td>
<td>-2*</td>
<td>3*</td>
</tr>
<tr>
<td>Stat_25 Backward linkages</td>
<td></td>
<td>-3*</td>
<td>-1*</td>
<td>0</td>
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<td>0</td>
</tr>
<tr>
<td><strong>Percentage of explained variance of each factor</strong></td>
<td></td>
<td>11.78</td>
<td>10.67</td>
<td>10.43</td>
<td>9.48</td>
<td>8.87</td>
</tr>
<tr>
<td><strong>Number of loading Q-sorts</strong></td>
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<td>9</td>
<td>4</td>
<td>9</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td><strong>Eigenvalues</strong></td>
<td></td>
<td>6.71</td>
<td>6.08</td>
<td>5.94</td>
<td>5.41</td>
<td>5.05</td>
</tr>
<tr>
<td><strong>Standard error of factor scores</strong></td>
<td></td>
<td>0.16</td>
<td>0.24</td>
<td>0.16</td>
<td>0.19</td>
<td>0.20</td>
</tr>
</tbody>
</table>

*indicates significance at the 99% level of confidence p<0.01
Appendix 4.3: Factor arrays for the three factors representing perceptions of Tam Lanh commune residents

<table>
<thead>
<tr>
<th>Statements</th>
<th>Indicators</th>
<th>fsc_f1</th>
<th>fsc_f2</th>
<th>fsc_f3</th>
</tr>
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<td>4*</td>
<td>1*</td>
</tr>
<tr>
<td>Stat_2 Road access</td>
<td></td>
<td>0</td>
<td>2</td>
<td>2*</td>
</tr>
<tr>
<td>Stat_3 Government spending on local education</td>
<td></td>
<td>-2*</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Stat_4 Total arable land</td>
<td></td>
<td>1</td>
<td>-2*</td>
<td>0</td>
</tr>
<tr>
<td>Stat_5 Cost of living</td>
<td></td>
<td>0</td>
<td>-2*</td>
<td>1</td>
</tr>
<tr>
<td>Stat_6 Perceptions of government corruption</td>
<td></td>
<td>-3*</td>
<td>-1</td>
<td>-1</td>
</tr>
<tr>
<td>Stat_7 Infant mortality rate</td>
<td></td>
<td>1</td>
<td>-1</td>
<td>-3*</td>
</tr>
<tr>
<td>Stat_8 Adult literacy rates</td>
<td></td>
<td>-4*</td>
<td>0</td>
<td>-1</td>
</tr>
<tr>
<td>Stat_9 Cultural continuity</td>
<td></td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Stat_10 School participation rates</td>
<td></td>
<td>-1*</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Stat_11 Unemployment rates</td>
<td></td>
<td>2*</td>
<td>0</td>
<td>3*</td>
</tr>
<tr>
<td>Stat_12 Morbidity by major health category</td>
<td></td>
<td>2*</td>
<td>2*</td>
<td>-2*</td>
</tr>
<tr>
<td>Stat_13 Forward linkages</td>
<td></td>
<td>0</td>
<td>-4*</td>
<td>-3*</td>
</tr>
<tr>
<td>Stat_14 Perceptions of safety and crime</td>
<td></td>
<td>4*</td>
<td>1</td>
<td>2*</td>
</tr>
<tr>
<td>Stat_15 Household income</td>
<td></td>
<td>1</td>
<td>0</td>
<td>4*</td>
</tr>
<tr>
<td>Stat_16 Perceptions of mining company transparency</td>
<td></td>
<td>-1*</td>
<td>-3</td>
<td>-1</td>
</tr>
<tr>
<td>Stat_17 Post-school qualification</td>
<td></td>
<td>-1*</td>
<td>-1</td>
<td>1</td>
</tr>
<tr>
<td>Stat_18 Displaced peoples</td>
<td></td>
<td>-2*</td>
<td>-3*</td>
<td>0</td>
</tr>
<tr>
<td>Stat_19 Land tenure security</td>
<td></td>
<td>2*</td>
<td>0</td>
<td>2*</td>
</tr>
<tr>
<td>Stat_20 Access to and quality of energy supply</td>
<td></td>
<td>-2</td>
<td>0</td>
<td>-2*</td>
</tr>
<tr>
<td>Stat_21 Biodiversity/access to natural resources</td>
<td></td>
<td>-1*</td>
<td>-2*</td>
<td>-2*</td>
</tr>
<tr>
<td>Stat_22 Government spending on local health</td>
<td></td>
<td>-3</td>
<td>2*</td>
<td>0</td>
</tr>
<tr>
<td>Stat_23 Health access</td>
<td></td>
<td>1</td>
<td>1*</td>
<td>3*</td>
</tr>
<tr>
<td>Stat_24 Air quality</td>
<td></td>
<td>3*</td>
<td>3*</td>
<td>-4*</td>
</tr>
<tr>
<td>Stat_25 Backward linkages</td>
<td></td>
<td>0</td>
<td>-1*</td>
<td>-1</td>
</tr>
</tbody>
</table>

Percentage of explained variance of each factor: 15.55 14.72 11.98
Number of loading Q-sorts: 24 23 11
Eigenvalues: 12.13 11.48 9.34
Standard error of factor scores: 0.1 0.1 0.15

* indicates significance at the 99% level of confidence \( p<0.01 \)
Appendix 4.4: Participant Consent Form (PCF)

Impact of Gold Mining on Sustainable Development in Quang Nam province of Viet Nam: A case study of Bong Mieu and Phuoc Son

Participant Consent Form (PCF)

I ………………………………………………………………… have read, or had read to me, the information sheet and any questions I have had have been answered to my satisfaction. I agree to participate in this project, knowing that I am free to withdraw at any time without needing to give a reason.

The researcher(s) have explained to me what kind of data is being collected, why they want to collect it and for what reasons, and how the data will be used and stored. I understand that none of the information I provide will be released or published by the research team in a way that will directly identify me.

I agree that the information I provide in this workshop forms part of the data gathered for this study that may be published, provided my name or other identifying information is not used.

I understand that the discussion and questions during the exercise, are to be recorded in order to reconstruct an accurate record of the exercise for data analysis, and will be permanently deleted from the recording device after a transcript of the record has been completed for use in this research only.

Participant’s name: ____________________________
Signature: __________________ Date: __________________

Participant Code:
(month of birth/initials of first and last name/first two letters of city, town or village of residence)

Approval to conduct this research has been provided by The University of Western Australia, in accordance with its ethics review and approval procedures. Any person considering participation in this research project, or agreeing to participate, may raise any questions or issues with the researchers at any time. In addition, any person not satisfied with the response of researchers may raise ethics issues or concerns, and may make any complaints about this research project by contacting the Human Research Ethics Office at the University of Western Australia on (08) 6488 1610, or (08) 6488 3703, or by emailing to hreo-research@uwa.edu.au.
Appendix 4.5: Survey of demographic information

Impact of Gold Mining on Sustainable Development in Quang Nam province of Viet Nam: A case study of Bong Mieu and Phuoc Son

QUESTIONNAIRE / SURVEY INSTRUMENT – EXERCISE SHEET

PART 1 – BASIC INFORMATION

Participant Code:

Today’s date: / /

Age:
☐ 45-49 ☐ 50-54 ☐ 55-60 ☐ 60-64 ☐ Over 65

Gender: ☐ Male ☐ Female

Community of residence (ie Village/Town):

How long have you lived in your community of residence?
☐ Less than 3 years
☐ 3 to 6 years
☐ more than 6 years. How many years?

If you have moved into your community of residence in the past 6 years, where were you previously and why did you move?

Village/town name:
Reason for move:

Occupation:
☐ Mining Company Officer
☐ Government Officer
☐ Community Representative: (Please specify)
☐ Farmer
☐ Small business owner
☐ Mining company employee
☐ Other: (Please specify)

Venue of workshop attended:
Appendix 4.6: Individual questions for Q-sort

Thank you for completing the Q-Sort exercise.

I would now like to ask you a few questions. There are no right or wrong answers, we are just seeking your opinions.

1. Let’s start off with discussion about which indicators were the most or least important to you and why.

2. As you went through the exercise, were there any indicators that you thought were missing? If so, what were they? How important do you think those indicators are?

3. Now that we’ve had this discussion, before we finish up, what other issues regarding mining and development would you like to share with us?

Thank you for your participation.
### Appendix 5.7: Key CSR initiatives in Phuoc Duc [Source: interviews and (Besra, 2017b)]

<table>
<thead>
<tr>
<th>CSR activities</th>
<th>Year</th>
<th>VND (million)</th>
<th>USD (estimation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repairing the Community House in village 4</td>
<td>2012</td>
<td>100</td>
<td>4,700</td>
</tr>
<tr>
<td>Upgrading the scheme water system for irrigation</td>
<td>2012</td>
<td>260</td>
<td>12,000</td>
</tr>
<tr>
<td>Clean water project for villages 1, 2, 3 and 4</td>
<td>2012</td>
<td>4,500</td>
<td>200,000</td>
</tr>
<tr>
<td>Toilets for village 4</td>
<td>2012</td>
<td>69</td>
<td>3,000</td>
</tr>
<tr>
<td>Equipment for Community Houses (Chairs, tables, loudspeaker and amplifier)</td>
<td>2013</td>
<td>100</td>
<td>4,700</td>
</tr>
<tr>
<td>Support to local socio-economic programs and community assistance program. E.g. roads, additional classroom construction, housing construction, educational and health care support for the poor.</td>
<td>Up to 2015</td>
<td>10,000</td>
<td>470,000</td>
</tr>
</tbody>
</table>
### Appendix 5.8: Key CSR initiatives in Tam Lanh, 2006-2014 (Source: interviews)

<table>
<thead>
<tr>
<th>CSR activities</th>
<th>Year</th>
<th>VND (million)</th>
<th>USD (estimation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Providing a clean water system for 451 households of villages 8, 9, 10</td>
<td>2006-2008</td>
<td>1,000</td>
<td>62,000</td>
</tr>
<tr>
<td>Supporting to build a kindergarten school</td>
<td>2006-2008</td>
<td>300</td>
<td>15,000</td>
</tr>
<tr>
<td>Computer: two desktops and one laptop</td>
<td>2010</td>
<td>30</td>
<td>1,500</td>
</tr>
<tr>
<td>Ten cows for breeding, along with cages</td>
<td>2010</td>
<td>140</td>
<td>7,000</td>
</tr>
<tr>
<td>Construction of a new community house</td>
<td>2010</td>
<td>40</td>
<td>2,000</td>
</tr>
<tr>
<td>Study tour</td>
<td>2010</td>
<td>80</td>
<td>4,000</td>
</tr>
<tr>
<td>Fifteen tables and fifteen chairs for local authorities</td>
<td>2010</td>
<td>47</td>
<td>2,500</td>
</tr>
<tr>
<td>Provision of books for a library</td>
<td>2010</td>
<td>110</td>
<td>5,500</td>
</tr>
<tr>
<td>Direct support for poor households</td>
<td>2010</td>
<td>35</td>
<td>800</td>
</tr>
<tr>
<td>Support for Hoa My kindergarten school</td>
<td>2010</td>
<td>7</td>
<td>1,750</td>
</tr>
<tr>
<td>Direct support for national events held at primary and secondary schools</td>
<td>2010</td>
<td>16</td>
<td>350</td>
</tr>
<tr>
<td>Provision of communication equipment for four community houses</td>
<td>2010</td>
<td>5</td>
<td>250</td>
</tr>
<tr>
<td>Construct of a new community bridge</td>
<td>2010</td>
<td>7</td>
<td>350</td>
</tr>
<tr>
<td>Computers: two desktops and one laptop</td>
<td>2011</td>
<td>30</td>
<td>1,500</td>
</tr>
<tr>
<td>Ten cows and eights pigs for breeding, along with cages</td>
<td>2011</td>
<td>200</td>
<td>10,000</td>
</tr>
<tr>
<td>A community house</td>
<td>2011</td>
<td>40</td>
<td>2,000</td>
</tr>
<tr>
<td>Study tour</td>
<td>2011</td>
<td>80</td>
<td>4,000</td>
</tr>
<tr>
<td>Paved People’s Committee’ yards</td>
<td>2011</td>
<td>235</td>
<td>4,700</td>
</tr>
<tr>
<td>Chairs for the commune medical clinic</td>
<td>2011</td>
<td>35</td>
<td>1,500</td>
</tr>
<tr>
<td>Direct support for national events held at primary and secondary schools</td>
<td>2011</td>
<td>33</td>
<td>1,650</td>
</tr>
<tr>
<td>Direct support for poor households</td>
<td>2011</td>
<td>40</td>
<td>2,000</td>
</tr>
<tr>
<td>Provision of communication equipment for four community houses</td>
<td>2011</td>
<td>20</td>
<td>1,000</td>
</tr>
<tr>
<td>Building of additional classrooms</td>
<td>2011</td>
<td>180</td>
<td>9,000</td>
</tr>
<tr>
<td>Upgrading a road An Lau- Que Phuong in 2013 (4.5 km)</td>
<td>2012-2014</td>
<td>7,000</td>
<td>350,000</td>
</tr>
<tr>
<td>Concreting a road connecting Dan Thuong village to Que Phuong bridge</td>
<td>2012-2014</td>
<td>2,500</td>
<td>125,000</td>
</tr>
<tr>
<td>Supporting the traditional medicine farm of the health clinic</td>
<td>2012-2014</td>
<td>10</td>
<td>500</td>
</tr>
<tr>
<td>Providing a rubbish collection for residents in 2013-2014</td>
<td>2012-2014</td>
<td>Not identify</td>
<td>Not identify</td>
</tr>
</tbody>
</table>
Appendix 5.9: Semi-interview questions for communities

SEMI-STRUCTURE INTERVIEW QUESTIONS

Thank you for participating in the interview. I would now like to ask you a few questions. There are no right or wrong answers. We are only seeking your opinions.

1. Water
   a. From where do you obtain your water (drinking/washing)?
   b. Do you treat the water and how?
   c. What is the current quality of your water (smell/taste/colour)?
   d. Has the quality of the water you use changed since mining began in the region and how (health/agriculture/animal husbandry/fish farming)?
   e. Has your family suffered from any illnesses due to the drinking water (before or after mining began)?
   f. Have there been any conflicts between local people and the mining company over water issues?
   g. Has the government or mining company taken any actions to improve water quality since mining began in the region?

2. Infrastructure
   a. Has the road access in your communities changed since mining began in the region?
   b. Has road access improved (new roads, road upgrades, new connections to villages/communes, new surfaces - gravel, concrete, paving, asphalt)?
   c. Can you estimate how many kilometres of roads have been built and/or upgraded since mining began?
   d. If roads have been added or improved, what benefits and disadvantages have you noticed (health, travel time, accidents, fear of accident, noise, dust, impact on the economy, market access)?
   e. Who took the actions to improve roads/road access: the government or the mining company?

3. Education
   a. What educational facilities do your children have access to?
   b. What is the quality of these facilities?
   c. Are there enough school facilities for the children in this region?
   d. Has mining contributed to the educational infrastructure and or quality of education delivered to your community/children?

4. Land
   a. Do you have a certification to recognise ownerships of your land?
   b. Have activities of the mining company impacted your agricultural land or the land of others in the community?
   c. What actions have been taken by the affected households as a result of impacts on agricultural land?
   d. Have the households been compensated?
   e. Can you comment on the impact of life and livelihood of those who have lost land?
   f. Have there been any disputes or conflicts between local people and the mining company due to land tenure?

5. Health
   a. Can you describe your access to health care facilities (hospitals, clinics, doctors)?
   b. Has mining contributed to the health infrastructure and or quality of health care delivered to your community?
c. What kinds of illnesses are local people most impacted by?

d. Have any new illnesses emerged or the number of cases of common illnesses changed since mining operations began?

e. Have there been problems with STDs such as HIV/AIDS in the community? Has this changed since mining operations began?

6. Income
a. Are any portions of your income impacted by mining operations (positive/negative)?

7. Employment
a. How many villagers are employed by the mining company (has this changed)?

b. How many people in the village are unemployed?

c. Has mining operation increased access to jobs for local people?

d. Has any training been provide to the local people since mining began, and if so what types?

8. Socio-economic issues:

a. Have mining operations impacted economic issues such as cost of living, inflation?

b. How was tension between business people and the mining company relating to debt been dealt with?

c. Has mining operation impacted social issues in the region such as security and crime, prostitution, alcoholism, drug addiction and cultural lost?

d. What is the migration situation in the region (in and out migration)?

e. Has access to natural resources such as forest, fish and other food sources been impacted by the mining operations?

f. Have any families been displaced by mining operation and if so how many? Have they been compensated by the mining company? Have they returned to a normal life? How long did this take?

9. Environment
a. Have mining operation impacted the environmental and if so, what have these impacts been [dust, noise, water pollution (river, pond, stream, well), soil degradation, chemical spill, forest clearance].

10. Mining company
Are there any transparency of mining company in terms of operation, trainings, compensation, ethic, and corporate social responsibility and so on?
## Appendix 6.10: Key legal regulatory mining policies for Vietnam

<table>
<thead>
<tr>
<th>Type of legal documents</th>
<th>Specific policy</th>
<th>Governing body</th>
</tr>
</thead>
<tbody>
<tr>
<td>Law</td>
<td>60/2010/QH12</td>
<td>National Assembly</td>
</tr>
<tr>
<td>Resolution</td>
<td>02-NQ/TW/25-4-2011</td>
<td>Politburo</td>
</tr>
<tr>
<td>Resolution</td>
<td>103/NQ-CP/22-12-2011</td>
<td>National Government</td>
</tr>
<tr>
<td>Decision</td>
<td>2427/QD-TTg/22-12-2011; 1673/QD-TTg/08-11-2012; 1388/QD-TTg/13-8-2013; 203/QD-TTg/27-01-2014; 645/QD-TTg/06-5-2014; 02/CT-TTg/09-01-2012</td>
<td>Prime Minister</td>
</tr>
<tr>
<td>Number of approved provincial mining plans</td>
<td>32</td>
<td>Provincial Government</td>
</tr>
</tbody>
</table>

### Appendix 6.11: Government agencies and their key responsibilities

<table>
<thead>
<tr>
<th>Government Agencies</th>
<th>Responsibilities</th>
</tr>
</thead>
</table>
| Ministry of Natural Resources and Environment (MONRE)     | - Collaborate with other Government agencies to disseminate mineral regulations.  
- Providing technical standards, quotas and prices relating to mineral exploration.  
- Drafting of mining development strategies and plans for obtaining Ministerial approvals.  
- Identification and zoning of mining areas.  
- Identifying mineral areas for non-auction for obtaining the Prime Minister’s decision.  
- Provision of information and education tools concerning minerals and mining.  
- Providing training and human resources for mineral activities.  
- Licensing and controlling mineral exploration and exploitation permits.  
- Organising auction events for obtaining rights for mineral exploration.  
- Administration of mineral exploration permits.  
- Provision of fundamental information concerning minerals and geology.  
- Evaluation of national mineral reserves.  
- Investigate and enforce breaches in mineral regulations.  |
| Ministry of Commerce (MOCOM)                              | - Collaborate with other Government agencies to disseminate information concerning mineral regulations.  
- Implementation and oversight of exploitation plans, processing and utilisation of minerals after obtaining approval.  
- Oversight, guidance, investigation and monitoring of policies, technical standards, occupational health and safety (OSH) regulations, and environmental protection in mineral processing and exploitation.  
- Evaluation and monitoring of facilities used for mineral exploitation and processing.  
- Categorisation of minerals, and enforcement and oversight of mineral export policies.  |
| Ministry of Construction (MOCON)                          | - Collaborate with MONRE for drafting national mineral strategies.  
- Collaborate with MONRE and related Ministries to enact mineral regulations including auctioning of mineral exploitation rights, and establishment of fee schedules and tax policy.  
- Collaborate with MONRE and MOCON to manage mineral resources.  
- Obtaining Ministerial approval concerning the use of minerals in construction and the exporting construction related minerals.  |
| Ministry of Planning and Investment (MPI)                 | - Collaborate with MONRE for drafting national mineral strategies.  
- Collaborate with MONRE and related Ministries to enact mineral regulations.  
- Participate in the evaluation and adjustment of development plans for the mining industry including environmental protection.  
- Collaborating with MONRE and MOCON to manage the mineral resources.  
- Participate in the licensing mineral exploration and exploitation projects.  
- Work with domestic and foreign investors to adhere with Investment Law.  |
| Ministry of Finance (MOF)                                 | - Collaborate with related Ministries to enact regulations including: Decree 22/2012/ND-CP, procedures of capital contributions, management of capital contributions of individuals and organisations relating to mineral exploration, and taxes for natural resources.  
- Enact regulations regarding fees for mineral exploitation, and management and utilisation fees.  
- Managing the State budget for mineral activities.  |
| Provincial People’s Committee (PPC)                       | - Develop documentation and enact regulations regarding the management of mineral resources and protection within a province.  
- Managing mineral exploration activities.  
- Local zoning for mineral exploration and exploitation.  |
| Commune and District People’s Committee (CPC and DPC) | - In conjunction with PPC, administer of local land leases and use of infrastructure for mining related activities.  
- General protection of the environment, unexploited minerals and natural resources.  
- Provide for the safety and security of mining communities.  
- Report to the PPC on matters concerned with mineral exploration at the commune/district level.  
- Provision and dissemination of mining related education materials.  
- Monitor and investigate breaches of mining regulations. |