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Understanding and improving policy and regulatory responses to artisanal and small scale mining

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ABSTRACT

Artisanal and Small Scale Mining (ASM) constitutes an important and growing component of the global economy. It has the potential to create livelihoods for people who have few other income earning opportunities, and to retain within national economies a large share of the wealth it creates. At the same time its potential negative environmental and social impacts are considerable. Given this combination of characteristics, ASM richly deserves to be a focus of policy and regulatory effort by the states in which it occurs. There is unfortunately little sign of such effort. ASM is often ignored by politicians and regulators. When it does attract their focus, policy tends to be inconsistent over time and characterised by wide discrepancies between legislation, policy rhetoric and policy practice. This article uses a heuristic model to illustrate key features of existing policy and regulatory responses, and to identify the basis for a more coherent and effective response. It argues that such a response must be focused on the local or regional level because it is here that knowledge exists regarding the realities of ASM on the ground, and because national governments lack capacity for effective regulation in the remote areas where ASM often occurs.

1. Introduction

Artisanal and Small Scale Mining (ASM) has grown to become an economic activity of global significance in recent decades. It is estimated that 20–30 million people are mining in over 80 countries, with a further 75–125 million people indirectly dependent on ASM for their livelihoods (Buxton, 2013; Verbrugge, 2014). ASM is focused on diamonds and other precious minerals and stones, and in particular gold, where ASM represents an estimated 10–15% of annual global production (Telmer and Veiga, 2008). It involves use of basic technologies (hand held tools, small scale equipment, harnessing of streams) in work units that range from individuals and families to scores of miners organised in teams. Mining focuses on easily accessible resources, usually close to the surface, and so viable ore deposits tend to be exhausted quickly. The result is that miners are highly mobile both between individual sites within a mineralized zone and between mining regions. Discovery of new or higher grade ore deposits can result in rapid shifts in population and emergence of large new settlements over short periods of time.[1]

ASM has considerable potential to generate economic and social benefits. The scale of the workforce involved and the low barriers to entry means that it can add enormously to income earning opportunities, and in many cases do so where alternative sources of livelihood are scarce or offer only a bare subsistence. Employment is created not only in mining. It is also generated in numerous service roles such as supply of food for miners and of equipment for mining and ore processing, entertainment venues, security, trading of gold and precious stones, and provision of education and health facilities for miners and their families. Income generated by mining tends to be widely spread and to be spent mainly in the local economy. This is in strong contrast to large-scale mining which is usually foreign financed and directs much of its income to overseas shareholders, banks, suppliers of sophisticated mining equipment and highly-skilled expatriate workers (Campbell, 2013; Hilson and Van Bockstael, 2013).

On the other hand ASM brings with it potential for serious environmental damage, arising from land degradation, deforestation, contamination and silting of waterways and mercury toxicity

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[1] This represents the briefest of summaries of what is a complex and highly variable activity. See Corbett and O'Faircheallaigh (2015) for a recent review of relevant impacts and issues associated with ASM.

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derived from ASM gold processing (Telmer and Veiga, 2009; UNEP, 2013). Negative social impacts associated with ASM include exploitation of child labour, neglect of community obligations and of traditional livelihoods such as agriculture, and the large-scale influx of outsiders which is particularly acute in gold rush areas. Large-scale population influx can lead, in turn, to health impacts from poor sanitation, increased substance abuse, and growth in unregulated sex work (Buxton, 2013) and sexual violence against women (Rustad et al., 2016). ASM involves large risks for miners, who rarely have the protection of health and safety regulations applied to large mining projects. The incidence of serious accidents and fatalities is high. Miners can also suffer in economic terms from the exploitative behaviour of the buyers who purchase their output.

This situation clearly calls for a robust and consistent policy and regulatory response by governments of states and regions with large ASM sectors, designed to maximise the potential benefits of ASM and address the economic and social problems associated with it. Unfortunately, current policy and regulatory responses tend rather to be incoherent, unstable, misdirected, counterproductive or ineffective and, in certain cases, non-existent (see for example Corbett and O'Faircheallaigh, 2015; Hilson and Okoh, 2013; De Failly et al., 2013).

This paper seeks to understand and address the inadequacy of existing policy and regulatory responses, in three ways. It first seeks to map these responses, using a heuristic model based on two key variables, the geographic scale of policy responses, and the extent to which they employ coercive as opposed to incentive-based policy instruments. The model is used both as a way of classifying policy and regulatory responses and to illustrate some critical features of responses that currently dominate the ASM 'policy landscape'. The paper then seeks to explain why policy responses tend to be both unstable and ineffective. Finally it seeks to identify what might be a basis for a more positive and coherent policy and regulatory response. It argues that such a response must be focused on the local or regional level. It is here that knowledge exists regarding the realities of ASM, knowledge that is indispensable if policy and regulation are to be translated into effective action on the ground. In addition, national governments often lack regulatory capacity in the remote areas where ASM often occurs, and in this context development of locally-based regulatory capacity is likely to be more effective. The paper uses a community-based approach to regulation of ASM introduced in 2015 by the Autonomous Bougainville Government, Papua New Guinea, to illustrate both the potential benefits, and the implementation challenges, of a locally-based approach.

2. Modelling policy and regulatory responses

A review of the international ASM literature (Corbett and O'Faircheallaigh, 2015) indicates that two key variables can help characterise policy and regulatory responses to ASM. These are the spatial level at which they occur (national versus regional or local), and whether they are based on incentives or inducements offered to miners, or on application of coercion or force to them. In Fig. 1 below these variables are represented by the **X**-axis and the **Y**-axis respectively.

The majority of nations tend to have regulatory regimes at two geographical levels, the national and the local or regional (Nyame and Blocher, 2010; Verbrugge et al., 2014; Verbrugge, 2015a,b). These regimes may apply independently of each other, or intersect and work in concert to varying degrees (see for example De Haan and Geenen, 2016; Verbrugge et al., 2014). National regulations or statutes dealing with ASM tend to share common features. They differentiate ASM from Large Scale Mining (LSM), restricting the scale of ASM on the basis of production capacity, land area mined,

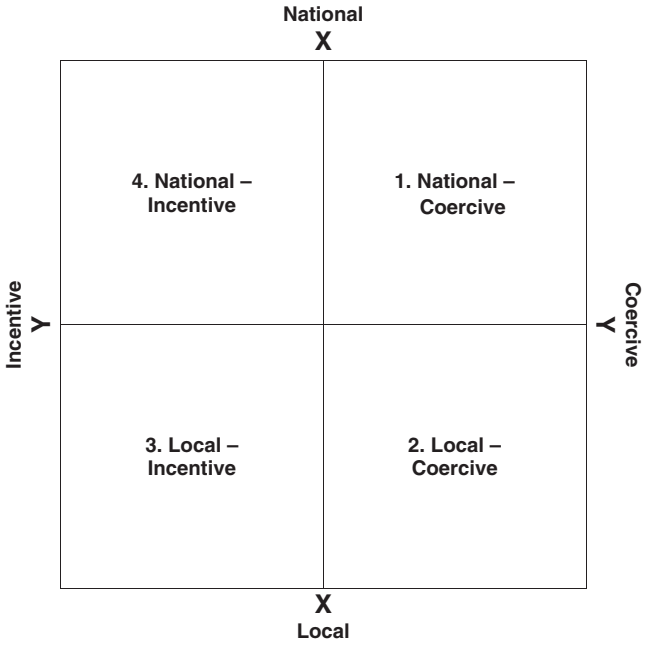

Fig. 1. ASM policy and regulatory responses.

numbers of people involved or types of technology used. They outline a process that miners must undertake to become licensed; and set out environmental, social and workplace safety regulations they must adhere to. Policy and regulation at the local or regional level, on the other hand, tends to be highly variable, including in terms of the nature of the entity involved. ASM may be controlled or regulated on the basis of traditional or tribal systems of governance and land allocation; by local or regional governments; or by local networks of miners and prominent individuals. The specific nature of the regulatory regimes adopted by these entities is also highly variable (Peluso, 2015; Verbrugge, 2014).

The extent to which national or local regulatory systems dominate varies from case to case, depending on a range of factors. These include the remoteness of mining sites, the type and scale of mineral deposits, and the capacity and legitimacy of national and local/regional governments. In Fig. 1 a system dominated by national regulation would fall above the **Y** axis, one dominated by local or regional regulation would fall below the **Y** axis.

A second key variable involves the extent to which policy and regulation is coercive or incentive-based. The further to the right one moves along the **Y** axis in Fig. 1, the more coercive the policy; the further to the left, the greater the reliance on incentives. Most national schemes combine elements of both. National ASM statutes tend to include incentives for ASM miners to formalise, which may include educational, technical, financial and infrastructure support, access to formal mining rights, and allocation of land for ASM. They also often provide for coercive measures if miners fail to formalise and comply with regulations. Filipino ASM legislation, for example, provides for the declaration of Minahang Bayans (people's small-scale mining areas), and training and capacity building for ASM coops and associations. The legislation also provides for the creation of a 'Taskforce Against Illegal Mining with assistance from the National Police and Armed Forces to ensure strict compliance' (Government of the Philippines, 2012). Governments may launch a crackdown on ASM in response to LSM interests that wish to clear a mining concession of artisanal and small-scale miners, or to a rapid increase in the scale of illegal ASM in a particular area. A crackdown may also be part of a wider drive to formalise ASM. For example military action may be used to enforce a requirement for miners to obtain mineral rights and

mitigate environmental impacts. Extreme coercion-based approaches, such as military crackdowns on ASM, tend to be unsustainable due to their high resource requirements, and so tend to occur only periodically. As Ellimah observes in relation to Ghana, 'that for me is not sustainable, the police cannot be there forever, they have to move on, once they move on, they [the miners] come back' (quoted in Spaull, 2016).

Locally based regulatory regimes generally lack the capacity for large-scale military action, but can still display coercive elements. They may involve threats of violence or actual violence toward miners or towards landowners who resist mining, by local politicians or by other powerful individuals who may be controllers or owners of a mining operation or who wish to assert their control. Local networks of powerful beneficiaries who control or unofficially regulate ASM may resist attempts by local governments to regulate their operations with threats of violence toward officials (Siegel, 2013). Incentive based approaches may involve local authorities providing security and certainty to miners. This may involve, for example, prioritising of ASM interests and activities over LSM, allocating land for ASM, and providing access to equipment and to training in safer and more efficient work practices. In exchange artisanal and small-scale miners may undertake to pay taxes to the local authority and mitigate environmental and social impacts of operations and/or settlements.

Linking the two variables of geographic scale and incentive/coercion provides four 'archetypes' of possible policy/regulatory responses, represented by the four quadrants in Fig. 1. These are nationally-controlled and coercive-based; locally-controlled and coercive-based; locally-controlled and incentive-based; and nationally-controlled and incentive-based. The characteristics of any ASM policy and regulatory regime in a given jurisdiction at any point in time can be plotted according to the extent to which national or local/regional level of government controls policy and regulation, and the extent to which policy and regulation is coercive or incentive-based. Most policy and regulatory approaches will fall somewhere along the axes in Fig. 1 rather than at either extreme. Where they fall involves matters of emphasis and judgment. However, even accepting the difficulty of *precisely* locating 'real-world' policy regimes on Fig. 1, the attempt to do so offers important insights into the complexities, uncertainties and volatility of ASM policy and regulation. The following sub-sections use the model to illustrate these features in three major ASM nations, Peru, Ghana and the Philippines, while Section 3 seeks to explain their occurrence. The applications of the model are designed to highlight its utility in describing and understanding ASM policy and regulation and the problems it confronts, not to offer an exhaustive description of all time periods and policy settings for the countries concerned.

2.1. Variation in ASM policy over time

Seeking to plot policy over time illustrates the high degree of variability that occurs over what can be quite short periods. This can be illustrated by the experience of Peru, where ASM has increased dramatically in recent years and is now estimated to employ nearly 400,000 people directly and indirectly, generate annual income in excess of $3 billion and account for about 14% of Peru's total gold production (InSight Crime 2013; PSG, 2012a, 2012b). Fig. 2 plots Peru's national ASM policy at different points in time, illustrating the oscillation between coercive policy involving military crackdowns and more incentive-based policies which, for instance, promote and support the formation of local ASM associations and provide investment incentives.

At the start of this century the National Government took a predominantly incentive-based policy approach. It enacted the

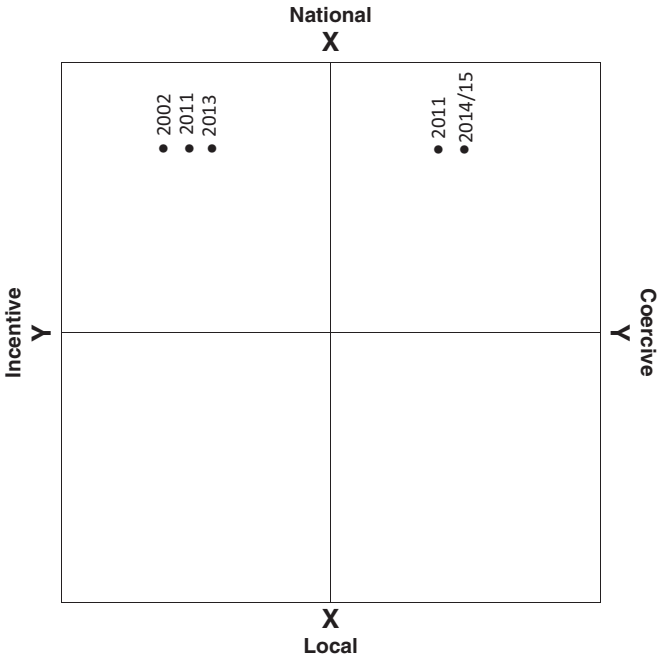

Fig. 2. National ASM Policy over time in Peru 2002–2014.

2002 *Law for the Formalisation and Promotion of Small-Scale and Artisanal Mining* (Law 27651), which established legal standing for ASM in Peru. The Law provided, for instance, that the Ministry for Mines and Energy (MME) would produce a development plan for ASM operations and for assisting miners to establish land rights. The State would also provide training and technical assistance in areas such as financial administration and contract law to the miners, and miners would obtain state authorisation for any physical or chemical process of extraction. This was closely followed by the World Bank sponsored Communities and Small-Scale Mining (CASM) Project, which facilitated the establishment of 36 associations or companies that benefit around 4000 artisanal miners, as provided for under the Law, in the southern region of Peru. However these initiatives quickly ran out of steam because they were not a priority for subsequent governments which were not prepared to commit the substantial resources required for their effective implementation. These problems were compounded by the Government's program of decentralisation. Numerous responsibilities were transferred from central government to regional authorities, but in this process the 'transfer of capacities and resources for these [ASM regulatory] activities were entirely neglected' (PSG, 2012: 5). Another factor was that the Ministry of the Environment, established by the Garcia Government in 2008, was politically sidelined and 'never gained control of environmental monitoring procedures for mining activity, and thus was unable to ease the burden on local authorities' (PSG, 2012: 5). In effect, in the latter years of the decade regulation of ASM effectively ceased altogether.

Following the election of the Humala administration in mid-2011, ASM did again become a focus of the national government. Initially the government drafted plans for formalisation which included a larger role for the Ministry of the Environment in monitoring impacts. By late 2011 policy direction shifted again. It now focused on a major crackdown on informal ASM in one of Peru's major ASM regions, Madre de Dios, which involved approximately 1500 police and military personnel destroying mining equipment and camps. In 2013 the Government indicated another shift in approach by stating it would provide resources to assist small-scale mining development in authorised areas,

creating incentives for miners to formalise (Emery, 2013). However, a further military crackdown commenced in October 2014 (Emery, 2014) and continued into 2015 when authorities destroyed 86 illegal mining camps (Gonzalez, 2016). The January 2016 announcement by President Cateriano of the construction of a military base in the Madre de Dios suggests the hard-line approach will continue, and has the potential to escalate (Gonzalez, 2016). The oscillation of Peru's national ASM policy between incentive-based and coercive-based approaches supports the Peru Support Group's conclusion that 'no coherent government policy on ASM has emerged despite the sector's dramatic rise over the past 30 years' (PSG, 2012: 6).

2.2. Lack of consistency between legislation, policy rhetoric, and policy practice

A second feature of policy and regulation of ASM is that very wide gaps can exist between the content of legislation dealing with ASM; ASM policies publicly espoused by political leaders ('policy rhetoric'); and the policies and practices actually implemented and enforced 'on the ground' by government agencies and actors. Fig. 3 plots these three dimensions of ASM policy in Ghana, and illustrates the divergence between them. ASM constitutes a large and growing sector of Ghana's economy, directly employing an estimated 300,000–500,000 people (Salim Nuhu, 2013). ASM is estimated to produce 34% of national gold production, in what is the second largest gold producing nation in Africa. In addition, 80% of the country's diamond production is accounted for by ASM (Hentschel et al., 2002: 12; McTernan, 2013).

Ghana's formal ASM policy and its ASM legislation has elements of an incentive-based approach and is mainly administered by the National Government, with some local involvement, placing it in the national/incentive quadrant. For example in 2010 the government released a 'Draft National Mining Policy of Ghana' which recognised the employment and livelihood opportunities created by small-scale mining, as well as tensions with large scale mining. The draft policy distinguishes small-scale mining from other mining in order to reserve rights to the former for Ghanaian citizens; outlaws child labour; and promotes ASM efficiency through access to finance, equipment and training. It offers assistance in obtaining fair prices for minerals through control of illicit trading and provision of business training; encourages the formation of a representative organisation; and simplifies licencing procedures. The Draft Policy flags the Minerals Commission's intention to manage land use conflicts when designating ASM areas, including through provision of advance notice and community consultations. The Policy also encourages LSM companies to support small-scale miners where it will be to the mutual benefit of the parties (Government of Ghana, 2014).

Fig. 3. ASM Legislation, Policy Rhetoric and Policy Practice in Ghana.

This approach contrasts with the policy rhetoric of senior Ghanaian government officials who regularly call for the eradication of the illegal ASM 'menace' by force, placing it in the national/coercive quadrant. The word 'menace' is used so often in government ASM rhetoric that the phrases 'small-scale mining' and 'galamsey menace' are synonymous (Ghanaweb, 2014a; Srem, 2014). In spite of widespread awareness of the difficulties that miners have complying with legislation and the government has in enforcing and implementing it, government rhetoric is relentlessly negative and draconian. Moreover it falsely dichotomises 'good' formal ASM with 'bad' galamsey when in practice it is often difficult to distinguish between them (Patel et al., 2016: 454). For example, while recognising the economic significance of ASM in Ghana, Minerals Commission CEO Tony Aubynn's condemns any form of 'illegal mining', and 'supports the Government's use of the security forces to flush out these illegal miners as one of the measures to curb this menace' (cited in Ghanaweb, 2014b).

The implementation of ASM policy and regulation of ASM on the ground happens at the local level, with varying approaches and results. In almost all cases it is divorced from both National Government formal policy and legislation, and the rhetoric of national politicians. For example, MP Simon Edem Asimah stated during a Parliamentary Select Committee tour of the Amansie West District in the Ashanti Region, popularly referred to as the Galamsey District, that influential persons, or 'big men', control ASM by securing large mining concessions which they lease to illegal small-scale miners (Ghanaweb, 2014a). Hilson and Garforth (2012: 446) state that chiefs and district assemblies in East Akim in Ghana's Eastern Region are working hard at the local level trying to regulate exploding ASM. While most Ghanaian ASM is viewed as illegal by the National Government, from a local perspective this is often not the case, with Galamsey miners being granted rights to mine under local customary laws. Banchirigah (2008: 35) explains:

> In Ghana, chiefs play an important part in the mining sector, overseeing compensation processes and spearheading negotiations concerning land transfers to companies. Perhaps even more importantly, despite mineral rights being vested in the presidency and chiefs playing no role in the approval of a mining concession, rural inhabitants see them as figures of authority. Thus, in areas that are relatively 'un-policed', as many *galamsey* camps are, chiefs stand to benefit financially from prospective miners by 'endorsing' their activities: in exchange for a fee, artisanal miners are granted 'permission' to operate.

According to Nyame and Blocher (2010: 50) ASM operators are disinclined to engage with state bureaucracy. They are at ease with the relative simplicity of the customary system, and ASM relationships with local communities tend to be 'cordial and in some cases symbiotic . . . presumably due to the shared socio-economic benefits'.

Thus at the level of regulatory *practice*, Ghana's approach to ASM would certainly be placed below the **Y** axis in Fig. 3, and towards the right of the 'Incentive' quadrant. While generally based on cooperation and mutual consent between ASM miners and local regulatory authorities, it can sometimes contain

elements of coercion in terms of forced extraction of fees and other payments.

2.3. Variation in policy at the local or regional level

Another feature of ASM policy and regulation is that where the emphasis is on the local or regional spheres, considerable variation in policy and practice can occur within a single country. This point is evident from the experience of the Philippines, where ASM occurs across more than 30 provinces, is estimated to employ up to 500,000 people, and to account for some 60% of national gold production (Buxton, 2013: 3). While the Philippines has national legislation purporting to regulate ASM, it has had limited and/or highly variable effect on operations on the ground. In practice the regulation of ASM has tended to occur at the local level. Local government authorities, landowners and miner networks have tended to modify or adapt national regulation, or 'informally formalise' ASM, and/or implement and administer their own systems of regulation in attempts to mitigate the impacts and maximise the benefits. In doing so they acknowledge the absence of alternative livelihoods and that ASM is extremely difficult to eradicate.

Fig. 4 illustrates the variation in local regulatory approaches in the Philippines by representing ASM policy and regulation in three ASM areas, South Cotabato in south-west Mindanao, Compostella Valley in central-eastern Mindanao, and Ga'ang in Balbalan municipality, which is north of Manila on Luzon Island. In all three areas ASM is regulated at the local level with little or no national government involvement. One reason is that government agencies responsible for ASM are under-resourced (Verbrugge, 2014: 3). In addition, many provinces have opposed the national government's antipathy towards ASM and its support for LSM. Provincial opposition to national mining policy has extended to some declaring themselves 'mining-free', as has occurred in Davao, Nueva Ecija, Biliran, Nueva Vizcaya, Cagayan de Oro and Eastern Samar (Lopez, 2014), and 'LSM-free' as has occurred in South Cotabato (Doguiles, 2014). The bans are driven by concerns over environmental impacts (Lopez, 2014) and poor revenue returns to the regions from LSM (Lacorte, 2014). They have been resisted by the national government's Mines and Geosciences Bureau (Lopez, 2014).

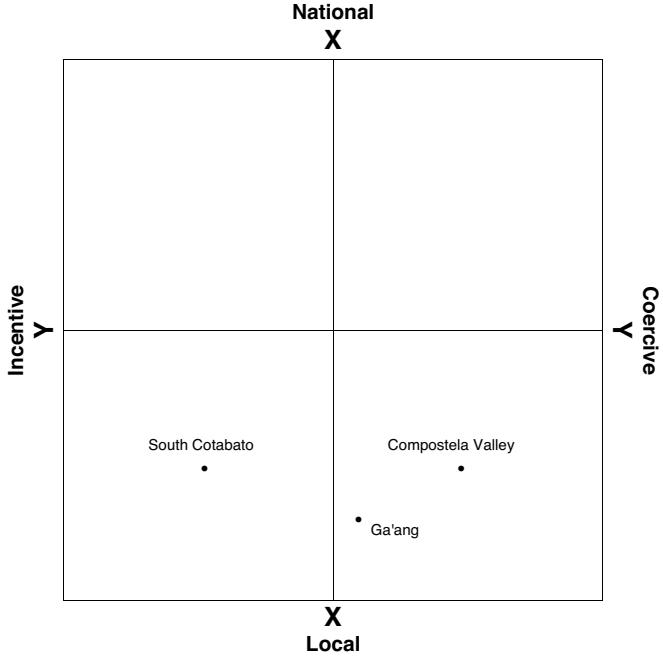

Fig. 4. Regional Regulation of ASM in the Philippines.

Verbrugge (2014) describes the evolution of ASM regulation at the local level in the Compostela Valley, via the organisational development of ASM operations and the movement of members of the 'nascent mining elite' into local positions of power. Regulatory measures include the construction of roads to mining areas, and 'a sophisticated checkpoint system to tax the transport of ores out of the mining areas'. According to Verbrugge (2014: 8):

> While falling short of providing the sector with full legal rights, this seemingly chaotic plethora of regulatory interventions nonetheless imbues small-scale mining with a degree of regulatory predictability that is highly conducive to its expansion.

He describes how capital investment by prominent local Sino-Filipino merchants has fostered the emergence of complex 'corporate-like management structures' and revenue sharing arrangements, and how '[i]n tandem with this nascent "corporatisation" of small-scale mining, more complex systems of labour division ensued'. Verbrugge (2014: 91) states that 'it cannot be overstated how the gradual capitalization of ASM engendered opportunities for accumulation for a nascent and highly heterogeneous "mining elite"'. As well as merchant investors, examples of the 'nascent mining elite' may include *corpo* members involved in a rich ore strike who reinvested in mines and/or machinery, and skilled workers formerly employed in struggling large-scale mines. The role of local networks of powerful individuals in regulating ASM places the Compostela Valley at the local end of the **X** axis. The strictly enforced hierarchy with threats of violence by enforcer-type mine managers (Verbrugge, 2015a: 1037), owners historically affiliated with armed groups (Verbrugge, 2014: 7), and rent-seeking by armed groups including the army, the police and communist and Muslim rebels (Verbrugge, 2015a: 1038), place it at the coercive end of the **Y** axis.

The remote Ga'ang ASM area in the Balbalan municipality, is tightly controlled by tribal landowners through the Banao Bodong Association. Miners must be tribal members, have a permit to enter the area, and pay a fee for each tunnel and 'rod mill' operated. Youths are only permitted to work during school holidays, alcohol is prohibited, and mercury is banned from the area, the miners instead using a multiple-sluicing method (Egan-Keane, 2013). Egan-Keane (2013) believes the adoption of mercury-free processing at Ga'ang is due to a locally distinct confluence of factors. These involve 'strong social cohesion, clear control by the local tribal association, a successful awareness campaign about the toxicity of mercury, and very high local mercury prices'. Given its strong regulatory enforcement Ga'ang clearly falls in the 'local/coercive' quadrant, but closer to the **X** axis than Compostela Valley because of the absence of violence or threats of violence.

South Cotabalo province is gaining a reputation as a leader in small-scale mining regulation in the Philippines (Doguiles, 2014). It has, at T'boli, the only Minahang Bayan (or designated ASM area) in the country that is fully monitored and regulated by the local government. Seigred Flaviano, head of the province's environmental management office, explains the province's approach:

> While other provinces in the country are clearing the area of small-scale miners to allow large-scale miners to come in, we are helping small-scale miners develop because we recognise them as the main drivers of the economy (cited in Lacorte, 2014).

Initially however the South Cotabato government took a scorched earth approach to ASM regulation in 2010. It shut down all mining in the Minahang Bayan due to protracted social,

environmental and safety problems. In 2011 a new dialogue commenced between the province and small-scale miners. The Minahang Bayan was reopened after miners agreed to pay tax (at P1000 per tonne of gold ore), meet environmental protection standards, improve conditions in the host communities and stop illegal hydraulic mining (Lacorte, 2014; see also Doguiles, 2014). Other local ASM regulations include issuing ID cards to miners on completion of training in safety and environmental protection (with NGO assistance), and 'individualising the issuance of ASM contracts'. Mining revenue has increased from P4.8 million in 2010 to P15.79 million in 2012 (Lacorte, 2014). South Cotabato has also signed an MoU with NGOs Ban Toxics! (Philippine) and Dialogos (Dutch), to eliminate mercury use. The program will involve a public information campaign and training in the 'Banguet method', an enhanced traditional technique using gravity and borax (Doguiles, 2014). In 2015 South Cotabato received a Galing Pook Award for outstanding local governance for its Minahang Bayan program, which was considered 'the first of its kind in the country, and even in the whole of Southeast Asia'. South Cotabato has also banned open-cut mining, effectively disabling LSM, believing it earns 'only a measly amount' of revenue from it (Lacorte, 2014). The national government has criticised the ban and tried to reverse it (InterAksyon.com, 2014).

Because of its training, public awareness and land allocation initiatives, which are characteristic of an incentive-based approach, South Cotabato is placed in the 'local/incentive' quadrant. However reflecting its willingness and capacity to completely shut down ASM at one point and the strength of its regulatory approach, it is placed close to the **X** axis.

While Fig. 4 illustrates the variability that can exist at the local or regional level, in general local governments tend to be in favour of ASM. Local politicians and business people are often involved in the sector and value its employment and other economic benefits; regional or provincial governments tend to be less hard-line or to 'sit on the fence'; and national governments are more likely to espouse an anti-ASM rhetoric and implement periodic crack-downs. In other words the closer government is to the ground, the more likely it is to be in favour of, or at least to tolerate, ASM, and also to resist or fail to implement onerous or hostile national ASM policies or regulations (Banchirigah, 2008; Catajan, 2014; Hilson and Garforth, 2012; Verbrugge, 2014; Webster, 2012).

3. Explaining regulatory approaches

What explains the inconsistent, variable and often contradictory approaches to ASM policy and regulation documented above? Clearly it does not reflect the ASM sector's lack of economic significance, because as noted in previous sections ASM is a major source of jobs and export income in each of the countries we have used to illustrate these features of policy and regulation.

Lack of national government capacity and resources in developing countries is one important factor. Challenges in this regard become especially evident in relation to ASM which can emerge and grow quickly in terms of the areas and numbers of people involved, and often occurs in areas remote from national capitals and where communication and access are difficult. Mining departments or other regulatory bodies are often chronically under-resourced relative to the scale of the task involved. For their part ASM miners often distrust outsiders. This reflects the historically illegal status of ASM, and the desire to protect knowledge of where valuable mineral deposits are located. The capacity of ASM miners to engage and comply with regulatory regimes is limited, and laws and regulations often prove ineffective due to the financial and administrative burdens they place both on governments and on small-scale miners. Even where miners have made sustained attempts to 'formalise' their activities, for example by registering cooperatives and/obtaining a licence to mine, they have often been frustrated by government inaction. In this situation miners are left with little option but to mine illegally (Hilson, 2002; see also Adler Miserendino et al., 2013; Artisanal Gold Council, 2013; Banchirigah, 2008; Manlupig, 2012; PSG, 2012a, 2012b; UNEP, 2012b; Verbrugge, 2014: 3; Webster, 2012).

These factors can help explain the gap between legislation and formal policy, on the one hand, and practice in ASM regions, on the other (see Fig. 3). Also relevant is a lack of accurate information regarding the realities of ASM 'on the ground', and a lack of understanding of the needs and concerns of miners, among national governments and among outside 'experts' who often conceive and manage interventions in relation to ASM (Banchirigah, 2008; Centre for Development Studies, 2004: 3). Veiga and Hinton (2002) identify lack of sound information regarding the realities facing artisanal miners as a key challenge in developing and implementing effective policy interventions, and in maintaining consistency in and support for regulatory regimes.

These factors do not necessarily explain why government policy towards ASM should be subject to rapid and extreme shifts (Asner et al., 2013; Verbrugge, 2014: 2; Webster, 2012). Here the contested and highly politicised nature of ASM activities is important. For example vested economic and political interests that may be inimical to, or seek to exploit, ASM may push government to adopt, or abandon, particular policies. Individuals with political or economic influence are often negatively biased toward artisanal mining, and may manipulate public perception about the activity for their own gain. Thus, government policies do not effectively address the realities of artisanal mining (Veiga and Hinton, 2002; see also Verbrugge, 2015a, 2015b). Hentschel et al. (2002:7) echo this view:

> In certain cases the lack of political will to create an adequate framework for legalising ASM can be explained by personal interests related with the possibilities for corruption, money laundering, and similar illegal practices, enabled by the informal status of the ASM subsector.

An indicator of the volatile and highly politicised environment in which ASM occurs is the frequency and intensity of miner protest action against governments. In recent years protests against existing policies, policy changes that were promised but never delivered, unevenly implemented policies, or proposed changes to policy have been widespread, occurring in Tanzania, Bolivia, Ecuador, Peru, the Philippines and Myanmar (Emery, 2014; Lwangili, 2014; Montrealgazette.com, 2014; Myanmar Freedom Daily, 2013; Sambalud, 2013; Vickers, 2014). Some of the protests are against specific LSM ventures that are displacing ASM and that miners believe were unfairly favoured by government policy makers or implementing agencies. The protests are always tense, often violent, and in the case of Bolivia and Ecuador, resulted in the deaths of protesters.

The relationships and interactions between LSM and ASM can also be important in shaping policy and explaining policy shifts (Buxton, 2013: 8; Hilson and Okoh, 2013; Patel et al., 2016). In her study of ASM in a small community in the Eastern Region of Ghana, Banchirigah (2008: 33) describes how military sweeps of mining concession areas in Ghana, which require significant resources, are 'usually funded by mining companies. Although company officials typically deny it.' In her view the Ghanaian government's approach to ASM has been driven by its focus on LSM. This has resulted in 'inappropriate regulations and the promotion of foreign investment in large mining projects at the expense of the welfare of rural communities' (Banchirigah, 2008: 36; see also Hilson and Okah,

2013: 149). In reality the nature of interactions between ASM and LSM are highly variable both across different provinces within nations and across different nations. They can also change over time. Corporate approaches to ASM have included seeking to 'absorb' ASM miners into their workforce (Estrada, 2013); purchasing ore from ASM miners (Fonbuena, 2013; Kelly, 2013); or providing resources to retrain or relocate ASM miners, often in cooperation with government agencies (AngloGold Ashanti, 2006; Kavanagh, 2013). They have also involved lobbying governments to provide a military presence to deter or stem ASM in their concession areas or to evict ASM miners by force (Banchirigah, 2008; Branford, 2013; Business News of Sunday, 2013; Vibe Ghana, 2013). The political lobbying of powerful LSM interests combined with the range of approaches they may adopt is important in explaining the volatile nature of government ASM policies, illustrated in Fig. 2 above.

Another explanation for policy shifts involves the political dilemma faced by governments which do not actively support ASM, or dislike it, but at same time know that they are unable either to stop it or to provide alternative livelihoods (UNEP, 2012a: 6; Hilson, 2010; Ghanaian Chronicle, 2014). This ambivalence towards ASM also helps explain the volatile nature of policy and of its implementation. It is in turn influenced by the belief that LSM is the 'main game', or the only 'real game' (Hilson and McQuilken, 2014). The Filipino Finance Secretary expressed this ambivalence when updating the media on protracted discussion regarding ASM policy: '[m]ining is, *by nature*, large-scale but at the same time we recognise that there is a need to allow small-scale mining' (emphasis added; quoted in Business World Online, 2013).

Finally, Hilson and McQuilken's (2014) concept of 'policy space' is helpful in understanding the poorly developed and inconsistent nature of much government policy and regulation. They argue that the primacy of LSM in national and international policy spheres leaves inadequate policy space for ASM, and that this helps explain the lack of consistent, effective, sustainable ASM policies. In their review of the evolution of ASM policy initiatives, they show for example how ASM has historically been treated as a subset of LSM by international development organisations in sub-Saharan Africa. They also describe a more recent case of how a UN global ASM policy initiative was 'sabotaged by consultants and mining industry people' (Hilson and McQuilken, 2014:13).

Is it possible to develop a more coherent and consistent policy framework which can help maximise ASM's potential in providing broad-based economic and social opportunities, especially where these are otherwise lacking, and at the same time effectively manage its environmental and social costs? In view of the discussion thus far, it seems apparent that regulation must be heavily focused at the local or regional level if it is to be effective, because it is here that the knowledge exists regarding the realities of ASM miners face on the ground, and that the capacity may exist to actually apply policy and regulation in the remote areas where ASM often occurs (on this point see also Muemeri et al., 2016). At the same time there is a need to ensure that local regulatory mechanisms are not captured by ASM or other interests driven by a desire to maximise short term profit irrespective of health, safety, environmental and social concerns, and that ASM miners enjoy a degree of consistency and predictability needed to secure their livelihoods and to invest in safer and less environmentally destructive mining methods. In the next section we outline a recent legislative initiative in Bougainville, Papua New Guinea, which offers promise in terms of institutionalising a major role for local authorities in regulating ASM while at the same time maintaining a degree of central oversight in order to achieve consistency and a balancing of economic and social and environmental considerations.

4. ASM policy and regulation in Bougainville, Papua New Guinea

4.1. The context for ASM and its regulation in Bougainville

The Autonomous Region of Bougainville (ARB) is a politically autonomous region of Papua New Guinea (PNG). Prior to PNG independence in 1975 the Australian colonial administration approved construction of one of the world's largest copper mines at Panguna in central Bougainville, by a subsidiary of the multinational mining company Rio Tinto. Development of Panguna encountered substantial resistance from local landowners. Bougainvilleans had no role in approving the project and received few of its benefits after it commenced operating in 1972. Moreover the landowners bore many of the mine's costs. These included environmental destruction caused in particular by riverine disposal of tailings (mine waste), and social disruption caused by village relocation, the influx of thousands of outsiders, and unequal distribution of the limited benefits that did reach landowners. This situation changed little after independence.

These circumstances led to an armed rebellion by Bougainvilleans and the forced closure of the mine in 1989. A protracted civil conflict followed attempts by the National Government, which relied heavily on Panguna for its revenues, to suppress the rebellion by force. The conflict resulted in thousands of deaths, led many educated Bougainvilleans to flee the island, and resulted in the permanent closure of Panguna and the destruction of much of Bougainville's physical and social infrastructure. It ended in 2001 with the signing by PNG and Bougainville of the Bougainville Peace Agreement, and the established of the ARB and the Autonomous Bougainville Government (ABG), which is delegated considerably wider powers than are available to a 'standard' provincial government in PNG.

In 1997–1998, faced with the absence of income-earning opportunities in the wake of the Bougainville conflict, people started to engage in ASM in and around the abandoned Panguna mine, and mining quickly spread to other parts of the island. ASM now occurs at over 50 sites; provides a livelihood, or supplementary incomes, for thousands of Bougainvilleans; and constitutes the second largest sector of Bougainville's cash economy after cocoa production. The ABG welcomes these economic benefits especially given the paucity of income earning opportunities, but is also deeply concerned about the costs associated with ASM. These include regular accidents and fatalities among miners; use of child labour; and social conflict associated with migration and conflict over land. They also involve environmental impacts resulting in particular with disposal of mining waste in river systems; and health and environmental impacts associated from widespread mercury usein gold recovery (for a full discussion see O'Faircheallaigh et al., 2016).

4.2. The Bougainville Mining Act 2015 and ASM

Until the ABG introduced its own mining legislation in 2014–2015, formal regulation of ASM in Bougainville occurred under PNG law, in particular by the *Mining Act* 1992. This situation created two fundamental problems. First, the *Mining Act* 1992 was not enforced. Second, had its ASM provisions actually been applied, they would have rendered illegal and so precluded much of the ASM activity that has occurred in Bougainville. This is because of the Act's highly restrictive definition of what can constitute ASM ('alluvial' mining on customary land, conducted by an owner of that land, and only in river beds, either wet or dry, or within 30 m of river beds, and without use of any mechanised mining methods). Some informal regulation of ASM also occurred. In most parts of rural Bougainville, considerable continuity is evident with pre-colonial

social and leadership structures, including the role of clan leaders, hereditary in some areas. It is common for such leaders to play various 'regulatory' roles in relation to ASM, for example by banning the use of mercury in their areas. Under the *Bougainville Council of Elders Act* 1996, local communities have been empowered to choose to have their local-level governments (Councils of Elders) comprised mainly of clan leaders, including 'chiefs' (see next section). These bodies also play a role in informal regulation of ASM in some areas.

The significant changes to PNG constitutional laws enacted in 2002 to give effect to the Bougainville Peace Agreement empowered the ABG to develop its own regulatory framework for ASM through a process for the transfer of powers from the Government of Papua New Guinea to the ABG (Regan, 2011: 432–4). The powers made available included all those involving mining. In the period 2006–2014 the ABG undertook the process required to take control of mining. This included establishing a Department of Mining with administrative capacity in relevant areas such as mining engineering geology and tenement administration (for details see Regan, 2014; forthcoming). The culmination of this process was the enactment in April 2015 of the *Bougainville Mining Act* 2015 (the *BMA*). It contains provisions on ASM that build upon the experience of informal regulation by proposing to incorporate local authority into a new formal regulatory approach, and are extensive and novel in an international context.

A unique feature of the *BMA,* not to our knowledge found in national or provincial mining legislation elsewhere in the world, is that the minerals on customary land are owned by the landowners, and not by the state. Under Section 8 of the Act 'All minerals existing on, in or below the surface of customary land in Bougainville are the property of the owners of the customary land'. This provision reflects the general belief among Bougainvilleans that ownership of land extends to everything on or in it, including minerals (Regan, 2014).

The *BMA* provides for grant of ASM licences, available exclusively to Bougainvilleans, through two distinct kinds of licences. One involves declaration of 'community mining licence reserve areas' (CMLRAs), and the subsequent grant within them of 'community mining licences' (CMLs). The other is the issuing of 'artisanal mining licences' (AMLs). CMLRAs are identified and proposed within their local jurisdictions by Councils of Elders (COEs) and/or Village Assemblies (VAs). These local government authorities are established under the *Bougainville Council of Elders Act* 1996 and operate as a two-tiered system (Regan, 2000; Sasa, 2013). Under the *Act*, a COE drafts a constitution which defines its structure and whether members are to be elected, or appointed from among clan leaders. About 70% of the 43 COEs are comprised mainly of the latter. The primary function of COEs is to promote peace and maintain law and order in their council areas, and they are able to create rules to that end. The COE may also collaborate with the ABG to implement projects and programmes and provide public services. The VA comprises all persons living in a village and is responsible for promoting peace and maintaining law and order by assisting chiefs or clan leaders in their role of settling disputes. VAs are also responsible for determining COE membership every five years, whether by appointment or election.

A proposal for a CMLRA must include the location and boundaries of the area, as well as a management plan providing 'for the granting, administration and oversight of community mining licences within the reserve area . . . [and] training programmes regarding the use of mercury and other prescribed chemicals in the recovery of minerals' (s.55(1)). The Department ('of the Bougainville Public Service responsible for mining and minerals') must provide training to relevant members of the COE and/or the VA which must include:

- Best-practice procedures for the granting, administration and oversight of community mining licences;
- Instruction on practices to be followed or avoided when mercury or a prescribed chemical is used to recover minerals;
- Instruction on mining methods;
- Other subjects as may be decided by the Secretary [of the Department].

CMLRAs may be declared for a period of 5 years. After a CMLRA is declared a COE may 'make rules for the granting and regulation of community mining licences [CMLs] in the area', and they may be granted and otherwise administered by a COE or VA within a COE. While the CMLRAs are identified, proposed and managed at the local level, the Bougainville Executive Council (the ABG Cabinet) retains the power to suspend the right of a COE to grant CMLs, and may revoke single, multiple or all CMLs within a CMLRA. The *BMA* does not specify the grounds upon which the Bougainville Executive Council may exercise these powers, with the exception of section 62 (2) which provides that a COE's authority to grant CMLs may be suspended and a CMLRA 'disestablished' if the COE fails to submit an annual report which meets the *BMA*'s requirements.

CMLs are granted solely for the purposes of artisanal mining within CMLRAs, and only Bougainvillean landowners, or Bougainvilleans with approval from the landowners, are eligible to hold one. A major reason for the *BMA* vesting COEs and VAs with the authority to grant CMLs is that these local-level organisations are close enough to the communities to be able to determine issues about land ownership, or approval by owners. A person or group applying for a CML must submit a plan outlining mining methods and environmental protection measures, comply with CMLRA rules and guidelines and hold a certificate of training in artisanal mining (s.73). A CML may be granted for one year, renewed for one further year, and may not be transferred. The *BMA* requires that CML holders must:

- Use only non-mechanised methods;
- Use safe practices whenever mercury or a prescribed chemical is used to recover minerals;
- Not employ or use child labour;
- Not mine deeper than 5 m below the natural surface of the ground;
- Not use explosives;
- Not discharge water from a sluice, pump or other equipment, except into a holding pond, settlement dam or similar structure or apparatus designed to protect a waterway from the discharge of silt, solids and other suspended matter;
- Keep the licence area free of alcohol and illicit drugs and ensure that miners are not in any way intoxicated while at the mine site.

A COE or VA that grants a CML has authority to revoke or suspend it if conditions of the CML are not met, and could then require further training before the licence is restored or granted anew.

An AML has many similar requirements to a CML including management plans, training, safe handling of mercury and chemicals, prohibition of child labour and explosives, and discharge of water. An AML differs from a CML in significant ways. It is granted and administered by the ABG under the auspices of a Mining Advisory Council established under the *BMA*; has an initial term of up to 10 years, with extensions for 5-year terms; and can be transferred under certain conditions. Other restrictions and requirements of an AML that differ from a CML are:

- Mining depth must not exceed 10 m, preventing open cut extraction or tunnelling (possible only under a full Mining Licence);

- Area of land must not exceed 5 ha;
- The holder must record the quantity and value of minerals recovered;
- 'Substantial mineral production' must commence within 6 months of the AML being registered and 'continuous commercial production' must be maintained;
- Mechanised mining methods are not prohibited, or more precisely, are not mentioned.

Together the provisions for CMLRAs, CMLs and AMLs constitute an attempt to design a regulatory framework that recognises the realities of ASM in Bougainville and at the same time helps to maximise its positive economic impact and minimise the risks associated with it. The vesting of mineral ownership in landowners is driven by the more general need, in the aftermath of the Panguna closure and the Bougainville conflict, to place landowners in a position to control mining on their land (Regan, 2015). However along with the provision allowing grant of CMLs to Bougainvilleans from other areas with the approval of landowners, it recognises and supports the current practice of landowners, under complex customary arrangements, in negotiating with 'outsiders' to access their land for ASM. It also places landowners in a strong position to negotiate substantial rewards for allowing such access. The restriction of CMLs and AMLs to Bougainvilleans is designed to help ensure that the rewards of ASM accrue locally. The requirement for AML holders to record the quantity and value of minerals recovered, and to quickly commence and then maintain commercial production, should ensure that the ABG is in a position to share in the rewards by collecting royalties on these mining operations.

A number of provisions seek to address risks associated with ASM. These include, in relation to mercury, the requirement for CMLRA management plans to include provision for 'training programmes regarding the use of mercury and other prescribed chemicals' and for CML holders to apply safe practices in its use, and the powers for COEs and VAs to suspend CMLs. Environmental risks are addressed by these provisions, by those dealing with discharge of water and the limits on the use of explosives and the size of CMLs and AMLs, and by the requirement for applicants for CMLs and AMLs to submit a plan outlining mining methods and environmental protection measures. Some of the potential social impacts of ASM are addressed by the prohibition on use of child labour and on the requirement to keep licence areas free of alcohol and illicit drugs. These provisions are also likely to assist in improving safety, as is the requirement for licence applicants to hold a certificate of training in artisanal mining.

The emphasis on local level governance through the establishment of CMLRAs and grant of CMLs is significant. As noted earlier, given the diversity of ASM in Bougainville and the remoteness of many ASM sites, local knowledge and 'presence on the ground' are likely to be critical if regulation is to be effective. The international experience certainly shows that regulation of ASM at the local level is often the most effective, due to limited central government capacity, ASM's occurrence in remote locations, and its highly dynamic nature. However what these and other modes of informal local regulation have in common is that they are, at least from the perspective of those engaged in ASM, an 'unstable construct' (Jonsson and Fold, 2009: 218). The lack of an institutional base and formal legal powers, combined with a tendency for central government to intervene in ways that undermine local decision makers, leads to inconsistent policy and practice on the ground. This in turn deprives miners of the predictability they need to undertake longer-term investment, including in safety and environmental protection measures (see for example Hilson and Okoh, 2013 on Ghana; and De Failly et al. (2013) on the Democratic Republic of Congo).

The *BMA* institutionalises the regulatory role of local authorities including customary leaders and grants them formal powers, providing a mechanism to enable local control to occur in ways that are predictable and secure for all participants. At the same time, the *BMA* confers on the BEC the capacity to suspend the powers of local authorities if that predictability and security does not in fact materialise. This of course assumes that volatility in central (i.e. ABG) policy and practice does not itself create conflict with local authorities and so generate regulatory instability.

Fig. 5 locates Bougainville's ASM policy and regulation on the heuristic model. The central role allocated to local governance structures and the emphasis on incentives clearly locates it in the locally-controlled and incentive-based quadrant. The power of the ABG to monitor and oversee COE and VA regulation locates it in the centre of the quadrant, rather than the bottom left-hand corner.

4.3. Implementation issues

The *BMA* appears to offer, in principle, an effective mechanism to help maximise the rewards, and minimise the risks, of ASM, both because of its substantive provisions and the regulatory role it affords to local authorities. However the ABG faces considerable challenges in ensuring that the *BMA* is effectively implemented and its potential contribution realised. This reflects in part the general paucity of resources and administrative capacity faced by the ABG. It has few sources of revenue as economic activity remains well below pre-conflict levels. In addition the National Government has frequently failed to honour, or honour fully and in a timely fashion, the funding commitments it made under the Bougainville Peace Agreement. Other constraints on capacity arise from the exodus of skilled personnel and the widespread cessation of schooling as a result of the Bougainville conflict, and from the fact that parts of Bougainville are still controlled by armed factions in the aftermath of the conflict.

Against this background the tasks the ABG must undertake to effectively implement the *BMA* are formidable. For example, it is required to provide training to COEs, members of VAs and CML applicants in all aspects of ASM, including licencing administration and oversight, handling mercury and other prescribed chemicals,

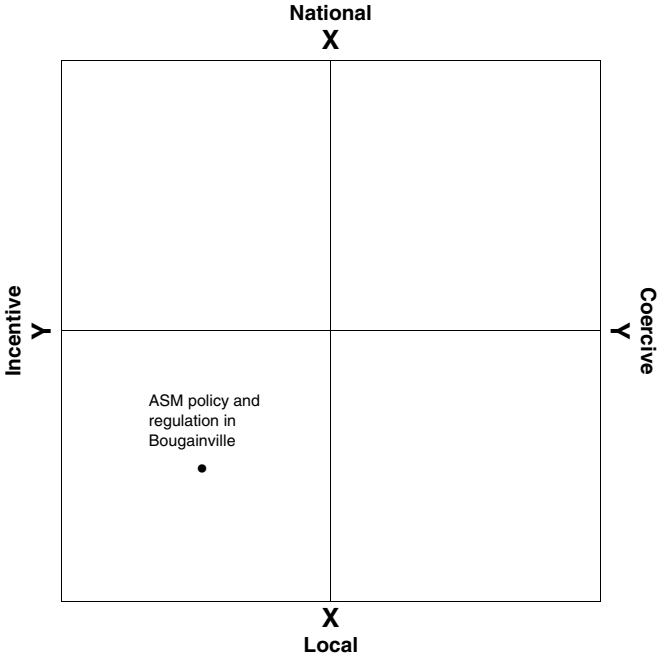

Fig. 5. ASM Policy and Regulation in Bougainville, PNG.

mining methods, and 'other subjects that may be decided by the Secretary' (s60(2)). The ABG will need to monitor and oversee COEs and VAs, and provide them with training needed to administer CMLRAs and CMLs effectively. It will also need to provide training to CML applicants and holders. COEs will need to be monitored in terms of correctly completing and lodging annual reports. Particularly given the dynamic nature of ASM and the extreme remoteness of some mining sites, ensuring that COEs and miners actually play their allotted roles and comply with the *BMA* is an onerous administrative task.

Another issue, just as important but more amenable to early action by the ABG, involves its Department of Mining. To date, the Department has been focused almost exclusively on potential roles in administration of tenements associated with large-scale mining and AMLs. It has shown no interest in ASM and has failed to develop expertise or capacity in its regulation. Indeed in a recent discussion with a member of our Project team, a senior Department officer indicated that the Department does not even have information on gold output from or numbers involved in ASM, or on its links with other economic sectors, indicating that this is due to 'the ABG's primary policy focus on large-scale mining'. Both this policy focus, and the Department of Mining's administrative effort, will have to shift to include ASM if the *BMA* is to be effective in maximising the rewards and minimising the risks of small scale mining. Early in April 2016, the ABG President expressed grave concern about the Mining Department's failure to work on the administrative and training arrangements for CMLRAs and CMLs (Momis, 2016).

5. Conclusion

ASM constitutes an important and growing component of the global economy, and one with the potential to create livelihoods for people who have few other income earning opportunities, and to retain within regional and national economies a large share of the wealth it creates. At the same time its potential negative impacts are considerable given the large areas of land and water it affects, its extensive use of mercury, the health and safety risks associated with it, and its potential for social disruption. Given this combination of characteristics, ASM richly deserves to be a focus of policy and regulatory effort by states in which it occurs.

There is unfortunately little sign of such effort. ASM is often ignored by politicians and regulators, and when it does attract their focus, policy and regulation tends to be inconsistent over time; characterised by wide discrepancies between legislation, policy rhetoric, and policy practice; and to vary from locality to locality and region to region. Policy confusion and inconsistency has done nothing to deter ASM, which continues to grow rapidly because of its power to create incomes and livelihoods for those who face few alternatives. It has meant that the full economic benefits of ASM have not been realised and that, with a few exceptions, its negative impacts have not been addressed.

Local authorities and governance institutions must play a key role if this situation is to change, because only they have the local knowledge and presence on the ground that is essential for the effective regulation of an activity that is dynamic, highly diverse, and often occurs in areas remote from national and regional capitals. At the same time some central coordination is important in ensuring a degree of consistency and predictability in the regulatory environment, and in ensuring that a balance is achieved between the powerful economic drivers of ASM and its environmental and social consequences.

The *Bougainville Mining Act* 2015 represents one attempt to achieve this combination of local regulation and central coordination. It confers mineral ownership on customary landowners, explicitly recognises their right to negotiate terms with ASM operators, and confers formal regulatory powers on existing, locally-based governance institutions, both of which serve to shift regulatory power to the local level. At the same time it requires those local institutions to address issues such as mercury use, health and safety, environmental impacts, child labour and alcohol abuse as part of their regulatory role, and then offers support in building their capacity to do so. It also allows the Bougainville Cabinet to revoke locally-issued ASM licences, and the right of local authorities to issue licences, though the drafting the of *BMA* in this regard could be improved by linking such action to specific breaches of the duties of local authorities. The ABG will also face wider challenges in effectively implementing the ASM provisions of the *Act*. But it has at least developed a model of regulation which reflects more closely the realities of ASM, and what is required to both promote and regulate an activity whose recent phenomenal growth shows little signs of abating.

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