

Small-scale mining in the philippines: a case study

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Introduction

Gold is the number one mineral produced by the Philippines in value terms. Although total local production was low relative to world production, it ranked 2nd to Africa in gold production per unit land area in 1988 and ranked 29th as top gold producer in 2002 (Israel and Asiro 2002). In the year 2002–2007, the Philippines' gold production increased by 8.2%. This contributed an average of 2% gross domestic product (GDP) in the same period. The country was ranked 18th in the GFMs Gold Survey list of top 20 Gold Producing countries in 2007 (Teves 2008).

The 2008 and 2009 data of the Philippine mining Almanac showed a significant amount of gold production by the small-scale gold mining operations in the country. Reports revealed that the small-scale mining sector contributed almost 80% of the total gold production. This is equivalent to a Php32B contribution to GDP in 2007 (ibid). The following 2008 and 2009 data are based on the amount of gold sold to the Bangko Sentral ng Pilipinas (BSP). The highest amount of gold produced in the country at 28,198 kg and 26,112 kg, respectively were generated by the small-scale mines (fig.). Local governments hosting the sector acknowledged the industry's economic contribution, as it somehow provides livelihood to the local community and unemployed migrants. There are some reports on the adverse impact of small-scale mining on the environment, health and human lives. However, research studies documenting the impact of small-scale mining industry on the local economy, environment, human health, public safety and the socio-cultural condition of indigenous peoples (IPs) in the mining areas, are limited.

The socio-political dynamics between small-scale miners and other stakeholders like community and civil society organizations, regulatory bodies, the government and large-scale mining companies remains undocumented. There were concerns regarding the implication of some regulatory policies on the small-scale mining industry as the application of such will prevent some IP communities from accessing their properties. Furthermore, questions arise on the actual impact of the industry on poverty alleviation. Some theory suggests that the small-scale industry may have aggravated poverty because of the weak regulation of the industry.

While economically significant, small-scale gold mining has been the target of strong opposition in recent years mainly because of its various adverse environmental and social side effects. Foremost of these is mercury pollution.

Background

Small-scale mining (SSM) refers to mining by individuals, groups, families or cooperatives with minimal or no mechanization, often in the informal (illegal) sector of the market. Small-scale mining relies heavily on manual labor and does not use explosives. The scope of the area allowed for small-scale mining should not exceed 20 hectares per contractor (1991).

In the Philippines, small-scale mining operators include subsistence mining (estimated 75%), individual or family businesses (estimated 15%) and established commercial mining firms (estimated 10%) (Hentschel 2002). According to the different interviews and focus group discussions, the operation of small-scale gold mining in the country can be traced as early as 10th century or even since time immemorial in the north and as late as <https://assignbuster.com/small-scale-mining-in-the-philippines-a-case-study/>

1990s in south Cotabato. Furthermore, numerous foreign studies already investigated the problem of mercury pollution due to small-scale gold mining, concentrating on the experience in Brazil.

High levels of mercury concentrations were found in the hair and blood samples of the miners and other affected people as well as in fish, soil sediments and forest and river ecosystems in small-scale gold mining areas of the Amazon region. In the Philippines, several studies also looked into mercury pollution based on the experience in Diwalwal, the largest small-scale mining site in the country (e. g. Mahinay et al. 1998, Bacani et al. 1996, Breward 1996, Balce and Cabalda 1992, Williams et al. 1995). High levels of mercury pollution were found on-site as well as in the affected places downstream.

Williams et al. specifically asserted that there were already considerable mercury loads in some sectors of the Agusan River, where Diwalwal drains into, and that the water samples from the mining site itself showed higher concentrations than those in the other gold rush areas in the world. Although studies on the impact of mercury pollution due to small-scale mining were already numerous, they were generally technical in nature. Few works touched on the economic aspects of the problem and did so only in a superficial and summary manner.

So far, there is no available study that conducted an economic analysis in a more detailed and quantitative way in the Philippines or elsewhere. Small-scale mining is not an important public revenue-generating sector for the government at present because of its largely illegal nature. Viewed in a more positive light, the activity should become a solid tax base when fully

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licensed, given the large number of people and economic activities dependent on it.

Laws and Institutions in Small-scale Mining

Laws The earliest mining law in the Philippines was Commonwealth Act 137 promulgated in 1936.

This legislation had no separate provision for small-scale mining since the activity was not practiced extensively then. It took effect for many years until the martial law era when it was amended through Presidential Decree (PD) 463, otherwise known as the Mineral Resources Decree of 1974. Like its predecessor, this legislation did not have separate provisions for small-scale mining. In 1984, PD 899 established small-scale mining as a new dimension in mineral development and defined it as a specific activity. Subsequent orders based on this law stipulated, among others, the rules and regulations governing the granting of small-scale mining permits and ordered the selling of the gold recovered through the activity only to the Central Bank and its authorized representatives. During the term of President Corazon C. Aquino, the Congress of the Philippines passed Republic Act (RA) 7076 or the People's Small-Scale Mining Act of 1991. Among its important provisions, this law established the People's Small-Scale Mining Program and described the small-scale mining areas that can be opened under it. During the administration of President Fidel V. Ramos, RA 7942 or the Philippine Mining Act of 1995 was passed.

This law stipulated that small-scale mining will continue to be governed by the provisions of RA 7076 and PD 1899 and their implementing rules and regulations. **Institutions** Prior to PD 899 in 1984, no government agency

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managed small-scale mining since it was not described as a formal economic sector yet. Those engaged in the activity did so without any government interference. With the passing of the law, the MGB was given the authority to administer small-scale mining.

Small-scale Gold Mining Process

The initial process of gold mining starts with prospecting.

In prospecting, the ore quality, "vein" geologic formation and ore assaying are examined. An area with a good ore quality is prepared for tunneling. In tunneling, holing and drilling are done using pick and shovel. Others who can afford it use electric hammer jacks. These initial stages of prospecting and tunneling are the expertise of the abanteros, whose knowledge of gold mining has been shaped by years of experience. In Benguet, the Ibaloi and Kankanaey miners are known Abanteros, having inherited their skills from their ancestors. Some migrant miners from the lowlands have also learned the skill.

In South Cotabato, the abanteros came from Diwalwal, Monkayo, Compostela Valley. Mine workers are hired to work on the tunnels. These are the ore and muck ore packers, Atraseros (ore exporters from inside the tunnel), ore washers (usually women), habal-habal drivers, horses and horse owners/guides as transporters of ores from the tunnel site to the processing area. Extracted ores are processed in the ball or rod mill plant for mercury amalgamation. The tailings that have accumulated for several weeks will be subjected to further cyanidation in the Carbon-in-Pulp (CIP) Plant.

The mercury amalgamation process will recover 40% of gold from the ores while the cyanidation will recover up to 60% of gold, both refined right after the smelting and/or firing process. Gold produced in button shapes will be sold to licensed gold buyers. A detailed process flow is presented in the following diagram (fig. 2).

Power Relations in the Sector

The mine is viewed as a resource, with various interested key players aiming to access it and benefit from it. There are several key players in the small-scale mining industry. With respect to the mining operation, the key players include:

- land owners
- tunnel owners (individuals or cooperative and association)
- financiers (foreigners, migrants or local, IPs and non-IPs)
- the abanteros or skilled miners
- the mine workers which include the atraseros (ore packers and haulers)
- ore and sack washers (usually women and young workers)
- ore transporters (habal-habal drivers, horse owners or guides)
- processing plant workers
- gold traders

On the trading side, gold produced by the small-mining operations are purchased by the licensed gold buyers and subsequently sold to the Bangko Sentral ng Pilipinas (BSP).

Non-licensed traders are also present in the areas and are commonly labeled as the “ black market. ” Black market traders would usually visit the community or are based in the community. Purchase price is lower in the black market but the miners save the cost of transportation in going to the city. Because of the savings in transportation, miners are encouraged to sell their gold to the black market. Regulation and enforcement of policies related to small-scale mining industry are under the Provincial Mining Regulatory Board (PMRB).

This is composed of the DENR- Mines and Geo Sciences Bureau (MBG) as the chairman and the Provincial Governor as the vice-chairman. The other members of the board are representatives from the SSM Association, large-scale mining Operators and Non-Government Organizations (NGOs). In Benguet and South Cotabato, a number of local officials are involved in mining either as tunnel owner, land owner or financier. This presents a conflict of interest between regulating small-scale mining and operating mines. The Abanteros are usually the ones with knowledge, skill and capability to engage financiers because of their prospecting and tunnelling skills.

Financiers initially provide funds for the operation of the mine but they are expected to engage with venture capitalists to expand the operation in the site. Venture capitalists can be foreign investors or locals who have the capital to infuse into the industry. Land owners, on the other hand, have the priority access over the resource, being the rightful claimants of the area. However, the land owners usually do not have the skills and the financial

capacity to start a mine. Abanteros and financiers can negotiate with land owners to tap the resource.

In some cases, the land owners can be financiers and tunnel owners, too. Some abanteros who have been successful in mining now act as financiers and tunnel owners; some have even managed to operate processing plants. It is common to see big-time tunnel owners and financiers also operate the processing plants in the area. Normally, all plant owners have tunnels but not all tunnel owners have processing plants. Owners of small mining operations with no processing plants pay for the use of existing processing plants, depending on the number of bags processed.

Mercury Pollution Due to Small-scale Mining

The Amalgamation Method of Gold Processing Mercury gets into the picture in small-scale mining because it is the main agent used to separate the gold from the mined ore employing the amalgamation method of processing. Amalgamation is popular in small-scale mining areas since it is simple to apply and requires relatively low investment. The Carbon-in-Pulp (CIP) Method of Gold Processing Gold can also be processed using the CIP method. This method can process the slurry produced by amalgamation or the milled ore coming from the rod and ball mills directly.

However, CIP is not used widely in small-scale mining because of the high cost of investment that it requires. The Health Impact of Mercury Pollution There are different ways by which the amalgamation method of gold processing causes mercury pollution. One way is when mercury is unintentionally spilled into the ground because of careless handling. Another is when mercury is discharged together with other wastes into inadequate <https://assignbuster.com/small-scale-mining-in-the-philippines-a-case-study/>

tailings ponds, or worse, thrown away directly into rivers and waterways. Still another way is when vaporized mercury is released into the atmosphere when the amalgam is blowtorched and refined.

Once in the environment, mercury is dangerous because of its potential adverse impact on human health. In the case of water pollution, part of the mercury discharged into rivers and waterways is transformed into methylmercury eaten by aquatic species and in turn consumed by people. Once inside the human body, mercury could trigger neurological disturbances as well as problems in the reproductive and other body organs (Viega 1997a). The likely symptoms are visual constriction, numbness of the extremities and the impairment of hearing, speech and gait.

The release of mercury into the atmosphere during blowtorching also puts to risk human health. The activity is usually done in open containers and closed houses so the inhalation of vaporized mercury is highly possible among the people conducting it and those close by. The long-term effect of this type of exposure is the impairment of the metabolism of the human nervous system that eventually leads to certain neurobehavioral disturbances. The visible symptoms are the exhibition of exaggerated emotional responses and muscular tremors and gingivitis.

Problems in Small Scale Gold Mining

Pollution due to Aside from mercury pollution, small-scale mining is beset with other problems that are also important and needing serious attention. These are enumerated and discussed in brief below.

Environmental Problems Cyanide Pollution

Pollution due to toxic and hazardous substances other than mercury that are used in small-scale mining can also endanger human health. The highly poisonous sodium cyanide used in CIP processing, in particular, could easily kill people and fish when discharged in rivers and waterways. Despite its dangers, cyanide pollution from CIP processing has not been investigated at all in any literature.

A probable reason is that, unlike mercury, cyanide is biodegradable and eventually decomposes into carbon dioxide and ammonia (Yannopoulos 1991) making it potentially less harmful over time.

Deforestation

Deforestation is a natural consequence of small-scale mining since many sites are located in forested uplands. The influx of miners and their families into mining areas results to the clearing of forests for habitation space and other human activities that causes deforestation. No study investigated in detail the impact of small-scale mining on deforestation.

One likely reason is that areas covered by small-scale mining are actually very small when compared to those used for other economic activities like forestry and logging (Veiga 1997b).

Soil Erosion

Soil erosion is another natural consequence of small-scale mining because of the mountainous and sloping topography of many mining sites. Miners level sloping land and scrape topsoil to make surface foundations stable for houses and other structures. They develop pathways and roads across highly

sloping and erosive areas and cover fertile soil with waste materials dug out of underground tunnels.

There are also no studies that probed in detail the soil erosion effects of small-scale mining although this environmental impact is potentially large.

Biodiversity Loss The loss of biodiversity due to small-scale mining is a direct after-math of deforestation and water pollution. Trees are cut leading to receding jungles that are natural habitats of terrestrial flora and fauna. Water pollution damages the rivers and waterways that are homes of aquatic plants and animals. As in the case of deforestation and soil erosion, there are no studies that investigated this issue.

Siltation and Sedimentation of Downstream Water Bodies

Siltation and sedimentation of downstream waterways occur when mine tailings and eroded soil finds their way into water bodies. They decrease the viability of affected waterways as fishing grounds, recreation sites and port areas. They also contribute to flooding and hamper the efficient functioning of dams and irrigation networks. Like the other environmental problems, siltation and sedimentation due to small-scale mining have received scant research attention.

Legal and Institutional Problems

Mining Rights Conflicts between Small-Scale Miners and Large-Scale Mining Firms Many small-scale mining areas are situated within the mining claims of large-scale companies. This situation has created conflicts between the large-scale miners on one side and the small-scale miners on the other side and prevented the smooth operations of the mining industry in general.

Presence of Medium-Scale Mining Operations in Small-Scale Mining Sites Dominant presences of medium-scale mining operations have been

competing for domination resulting in the significant loss of lives and deterioration of peace and order.

Social Problems Worsening Social Instability in Small-Scale Mining Areas

Many small-scale miners are migrants in the areas where they mine. Hence, they find it difficult to adapt socially with the local population. To some extent, vices like alcoholism and gambling also exist in these areas that add to the conflict. Limited Basic Services in Small-Scale Mining Areas The supply of basic services such as those relating to health and transportation and others has been limited in small-scale mining communities. This has greatly exacerbated the poor conditions and social problems within these areas.

Exploitation of Women and Children in Small-Scale Mining Women and children are engaged in the gathering of ores inside tunnels and even in processing which are activities suited only for grown-up men. Although small-scale miners deny this, key informants and ocular inspection in the two case study areas confirmed this problem

Economic Problems

Low Price for Gold Received by Small-Scale Miners Small-scale miners sell their gold to the tunnel owners, processors or to other traders instead of directly to the Central Bank or its representatives.

Key informants reported that underpricing of gold often occurs in these marketing channels and this contributes to the poor economic conditions the miners are in. Loss of Gold by the Country Due to Illegal Gold Trading Because small-scale miners sell their gold not to the Central Bank but to various buyers, the national government loses great amounts of gold to the

detriment of the entire economy. Lack of Formal Sources of Credit for Small-Scale Miners There is lack of formal sources of credit for small-scale miners in times of need or for starting an alternative occupation.

This forces them to borrow from the tunnel owners, processors, traders and unscrupulous moneylenders who exploit them by charging higher interest rates or buying their gold at low prices. Lack of Alternative or Supplemental Employment Opportunities for Small-Scale Miners Small-scale mining is the only employment opportunity for many miners. Few have an alternative occupation like farming. Also many miners have been in mining for an average of 10 long years, which further confirms their lack of alternative employment. Technology-related Problems

Inefficient Technologies Used in Small-Scale Mining The technology used in ore extraction and gold processing results to poor ore output and gold recovery in small-scale mining. The poor ore and gold output performance has been confirmed by national and local key informants. Unsafe Technologies Used in Small-Scale Mining The unsafe techniques and procedures used in the mining of ore, such as poor timbering support, poor ventilation, and other practices have resulted to cave-ins and other accidents that disabled or took away the lives of miners.

Conclusion

The conflicting policies on resource extraction/development versus environmental protection and weak governance as indicated by the absence of local regulations threaten the environment and public health. The negative impacts of small-scale mining activities have been observed in many of these communities. Poverty and the attractiveness of immediate

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money from the mining industry attract children and women to work in the mines. These expose women and children to hazardous chemicals and unsafe mining practice.

Small-scale mining contributes to the local economy through job creation, increasing economic activity in the communities. There is a need for the development of sound policies and laws to balance economic development and environmental sustainability. Strong enforcement of laws is a must. However, the conflict of interest of local officials who are in charge of regulation and governing the community and who also have interests in mining operations poses a threat in the strict enforcement of laws in the communities.

Recommendations

Mercury Pollution

A review will show that the existing laws and regulations related to mercury pollution in small-scale gold mining are fairly adequate but monitoring and enforcement is weak. To improve on monitoring and enforcement, the following actions are suggested:

- Licensing by the LGUs of all small-scale gold mining and processing operations within their jurisdiction and imposition of membership in a cooperative as a licensing requirement.
- Earmarking of the licensing proceeds for the establishment and operation of a small-scale mining monitoring and enforcement unit within the management framework of LGUs. Development of an effective internal system within cooperatives that will force the proper

use of hand gloves, mercury retorts and tailings ponds in small-scale mining.

- Active involvement of NGOs and other responsible members of the local population in monitoring and enforcement by selectively deputizing them.
 - Strengthening of the Small-Scale Mining Section of the Environment and Safety Division of the MGB
 - Concerted effort by the national government, LGUs and NGOs to conduct education and awareness campaigns on mercury pollution. Involvement of international organizations in the fight against mercury pollution particularly in the promotion of technologies that can prevent or minimize it.
 - Serious consideration of the promotion of the CIP method of processing for small-scale mining
- Other Environmental Problems The national government should undertake detailed studies on cyanide pollution, deforestation, soil erosion, biodiversity loss and siltation and sedimentation in small-scale mining areas. Understanding these problems will go a long way toward finding their appropriate solutions.

For the time being, the government must do better in monitoring and enforcing pertinent laws so that the problems are minimized. Legal and Institutional Problems The government should prioritize the early settlement of conflicting claims between small-scale miners and large-scale miners. One way of conducting this is to create dialogues between the two parties with the government as arbiter to find an amicable solution. Key informant from the large-scale firms in the two case study areas explained that generally

they are actually open to a negotiated settlement that can buy peace, goodwill and cooperation within their claims.

Social Problems

The social instability in small-scale mining is inherent in places where many of the population are poor and migrants. Improving the economic status of the people can help a lot to decrease the instability. This could happen when small-scale mining becomes a fully licensed activity and accepted as part of the economic mainstream. The provision of better basic social services will also help alleviate the deprived economic conditions and ease a lot of the social tensions. The exploitation of women and children is not confined to small-scale mining since it is prevalent, especially in the underground economy.

The Department of Social Welfare and Development

(DSWD) should take a closer look at this problem and devise ways to minimize it. Again, improving the economic lot of the miners will help curb the exploitation of women and children. The conduct of effective programs which can provide guidance and counselling to mining families will also promote compliance by the miners to the laws against exploitation. Economic Problems The problem of low price received for the gold by the small-scale miners will be addressed to a large extent when they are organized into cooperatives.

As a group, they can negotiate better in the market or pay for the transportation cost to sell gold in bulk to the Central Bank. The Central bank should consider putting up buying stations in the more important mining sites. This will not only help the miners economically but also lower

significantly the amount of gold lost to the black market. Technology-Related Problems The problems of inefficient and unsafe technologies are part and parcel of small-scale mining as long as the miners remain poor.

Economic conditions force them to use said technologies since they cannot afford to employ more sophisticated and costly ones.

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