

THE PROBLEM OF HEALTH AND SAFETY ISSUES IN GOLD MINING COMMUNITIES IN KALIMANTAN

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Kalimantan is an Indonesian island that has many natural resources such as, coal, gold, oil and gas. Those things become a source of income for people and of course governments – national/ regional, district or sub district. Besides Multi National Companies (MNCs), miners also come from communities - Small Skill Mining (SSM). Gold mining activities have been known in the island of Kalimantan since 1850. Formerly they only used simple tools held in their hand without any protection, no gloves or any other covers – artisannal mining. Gold mine is one of the small scale mining activities which have been exploited since 1948. In 1980s, Banjar ethnic introduced a simple technology to extract the land and river in order to find an ore and make it in to a piece of gold. Hence, up to recent time, gold mining is a popular and promising job for many people in most part of Kalimantan These natural resources attract not only the for natives (Dayak, Kutai or Banjar) but also many ethnics from other islands, for example: Bugis, Makassar and Toraja from Island of Sulawesi and ethnic Javanesse, Sundanese and Madura from Island of.

1. Overview

In East Kalimantan there are three major districts full of activities in Gold SSM as in, Kutai, Berau and Paser. But Gold mining found in 36 locations nine in Kutai, 16 in Berau and 11 in Paser. Each location can produce about 32 grams to 315 gram of gold everyday.



In this case, SSM or in native's words : people mining can not be directly associated with a certain party/ individual work in illegal mining. The facts on this activity revolve around an entity within the community, which encompasses various level and elements as follow : community members who are seeking to generate income, government apparatus, vendors or small scale business, local social economic elite (community leaders), intermediary merchants and owner of sets/ mines.

In the social – economic context, those people feel that they are entitled to benefit from the natural resources in their area. Its activities have given positive

contribution to the local people and their economy. Nevertheless, gold miners tend to neglect safety requirements. The mining activities provide employment and business opportunities for local government agencies, security apparatus, local business and the general public. The local government at the district and sub district level is no exception. From the economic point of view, it is undeniable, that they give meaningful contribution to the people.

This paper tries to answer the following questions : “what are the key health and safety issues which need to be addressed in the ASM sector, how are these issues currently addressed in policy and practice, and how can governments and communities work together to address them more effectively ?” Basically before discussing those issues, it is necessary to look at the kind of technologies they have.

Miners Technology

Gold Mining in Kalimantan was introduced by Dutch about 1850. However, after Indonesian independence, there are some big companies seeking gold in Kalimantan. PT. Kelian Equatorial Mining (KEM) which operated in surrounding of Kelian River – sub river of Mahakam River, PT. Indo Muro Kencana (IMK) in Central Kalimantan and PT. Arutmin in South Kalimantan. Besides those companies, many big companies operates too in Kalimantan such as Kaltim Prima Coal (KPC), PT Adaro, and PT Bukit Baiduri Enterprise in Coal Mining; PT. Virginia Indonesia Company (Vico) and Unocal in oil and gas; PT Lonsum in CPO; PT. Limbang Praja and PT Anangga Pundi Nusa that have concession to exploit the forestry.

People mining are the local resident or immigrant from other islands who seek a job. However, they are not so lucky by joining those big companies and being farmers can not fulfill their life. So that, they survive in living being as peasant, trader or become miners. Coal and Gold are the alternatives. To seek gold, miners can do this in two areas; land surface or river. On land surface, people do the *dry suck* or sprayed by water, and in the river they do with *wet suck*. “Suck” means that the sand and mud in certain area will be exploited by a machine and then delivered to a filter. After this, miners extract these material to separate gold from others using hand. Even though gold mining activities conducted on the land surface the miners still need water to strain sand and mud using a filter. If these activities do not carried out nearby a river or sub river, they will get water by pumping from land.

Mining community in Long Iram

Many locations in Kalimantan mining areas are interesting to be discussed since they have certain uniqueness. However, there is one location that has special distinction comparing other places. It is located on *Sungai Babi* – get a move on Kelian River. Kelian River is a sub river of Mahakam River on its beginning part. More than one decade, hundreds persons have been living and

working there in Small Scale Mining. This location is a part of Long Iram District, Kutai Barat Regency, and East Kalimantan Province. Their ancestor came from Long Iram and they were of Dayak sub ethnics; e.g. Bekumpai, Kayan, Benuaq, and Tunjung. The miners from course of Mahakam river found the Kelian village in 1948. Today, however, some people come from Java and Bugis too.

Long Iram district consist of 21 villages and some of them are the transmigration kinship from Java since 1980th. Kelian Dalam Village has been located about four hours from the district. These villages consist of 20 household from Dayak ethnic which origin of Long Iram. Since 1952 that village had been increased about 40 household of Dayak. Then, population have been growing up paralleled by gold finding there. In spite of the turn over of inhabitants figure, population in Kelian Dalam could be described as follow :

Tabel 1 : POPULATION IN KELIAN DALAM

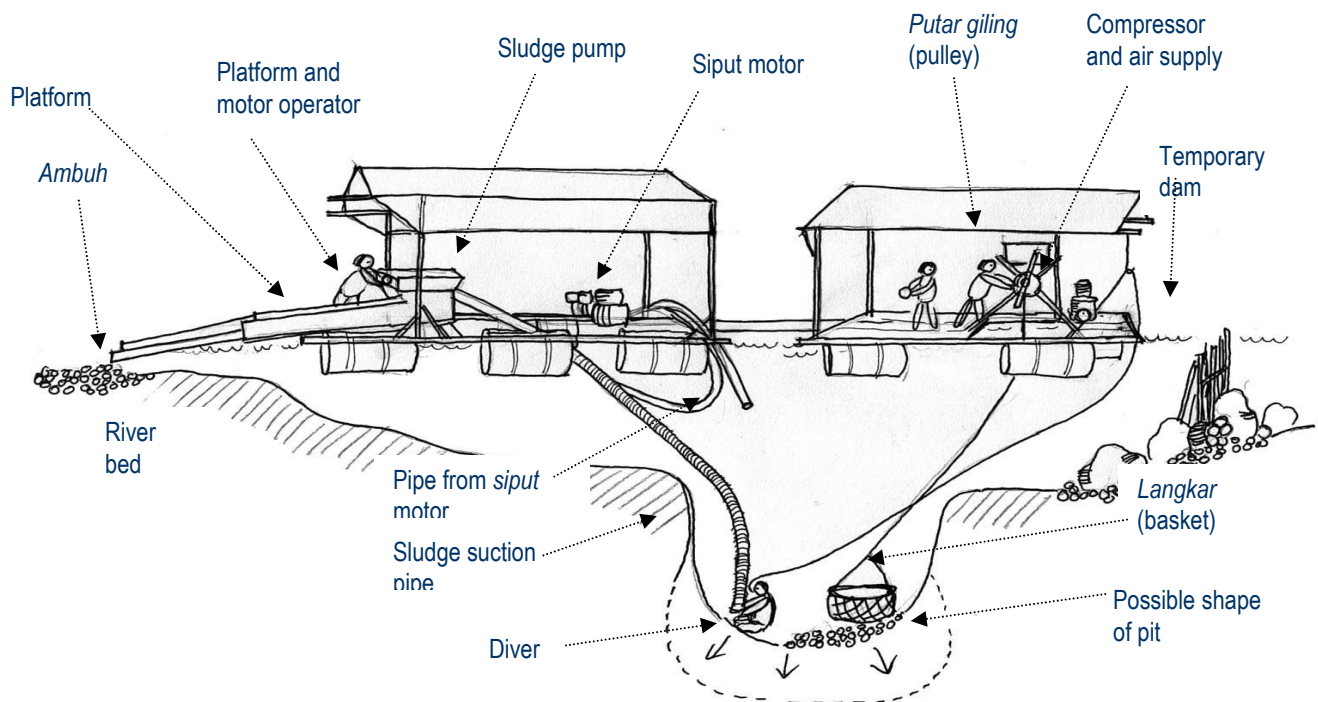
AGE	SEX		TOTAL
	male	female	
0 – 6 y.o.	62	60	122
7 – 17 y.o.	119	104	223
18 – 50 y.o.	81	69	150
> 50 y.o.	31	16	47
TOTAL	293	249	542

Source : International Labor Office. *Pekerja Anak di Pertambangan Kutai Barat*, 2004

Formerly, their ancestor was a farmer and also they are. Nevertheless, since gold being a popular profession there, they are becoming miners. Despite it, they maintain their farming to support their daily life needs. There is a unique methods to find the location which has contain much gold, their faith guide them to some spot in the village or surrounding. Hill, aside of the river and in bottom of the river itself. Knowing them, they usually ask psychic to lead them.

There are two kinds of technology in used by miners in Kelian Dalam; dry suck and wet suck technology. Caused by reducing the substance of gold in Kelian hill or land, wet suck technology being a popular one. Since, the substance of gold could be found in the bottom of the river.

Picture 2 : Wet Suck Technology



workers will get in the same part when they get gold and they trust to each other. In one group we can see that cooperation within them is good enough. Miners' income from this job is unpredictable.

Some time they get much money but sometime they get loss. In Shiny season, their working condition better than in rainy one. They get more gold because the stream of the river is slow and the bottom of it is shallow. They call it "mopo". However, in later years, they admit that their output is lower than before. They say that, "it is caused by the big company nearby has concession to exploit gold surrounding their area".

There is no working time strictly be ruled in there. However, normally they work from 8 AM until 5 PM. Almost of them can do every kind job, there is no specialization, except chief operator. After the machine is switch on, the workers take their positions, some stand by on the first liner, some stand on the second liner, and one of them is ready to jump into the river, wearing a short length shirt because he doesn't worry about something that flowing in a river which can hit their body. In miners' mind, diver can not think it over, because they have built a dam in their location. Despite, in some place many of divers always wear a full length of shirt because they can not block the river stream by their dam and they worry about their body which can be hit by garbage such a wooden branch flowing in the river. Usually they wear glasses because the river is dirty and no one can see through the water. They use oxygen mask by bite its tube because they go underwater about 30 minutes until one hour. Each day someone can dive 4 – 6 times. Of course it is freezing for him. To get rid of the cold the diver drinks *Topi Miring (TOMI)* that contains 43 % alcohol and smoke before and after going

under water. Everyone smokes about 1 box of cigarettes and in one group can consume 2 – 3 bottles of *TOMI*. But for some groups, they do not consume alcohol since their belief do not allow it or their boss think that their findings are not adequate to buy it.

One dives about 4 – 8 meters under the surface or until he can reach the bottom of the river. His duties are to separate the stone from the swamp, and to keep the pipe line in track. The stone will be thrown in to the (langkar) basket and some workers in the first liner will pull it up to the surface and leave it out of mining area. Swamp that mixed with sand will be sucked to the second liner. Platform and machine operator will then fling the garbage or some unused things. Many of them had experiences, 'got diamond', so that they use iron trellis to catch this more valuable thing. However it is very rarely. Yet, no sufficient safety requirement is used there. Sand is extracted by the filter, but their naked skin still makes a contact with other materials and those tools.

Miners put the reserve swamp in a certain pan (loyang). While holding it in their hands the pan is shaken in circular motion – pan for gold. Because gold and iron ore are heavier than mud or sand, they will reside on the bottom of the pan but the others are spilled out. Then they add 2 spoonful of mercury in to the pan, and mix it by their hand. Gold is trapped by mercury and twin into small balls but iron ore is separated. Gold covered by mercury is then taken and be wrapped in handkerchief. Miners will then squeeze them by hand, mercury filter through the pore of handkerchief, but gold still remain. Some gold collected will be brought to a small shop. To ensure that these are pure gold that has not contamination with mercury shop owner burn them in fire. It gives out some smoke and disseminates a certain smell – the mercury. However, the people (shop owners, miners and others) are still chatting, & laughing while they are waiting for their gold.

Seeking gold in the river, could be done in as long of a years, but the beneficiaries are in shiny seasons about June until October. Surface of the river would be low and fuel could be efficient because it does not need to suck and pull up the wooden branch, mud and small stone. In this season, they find the amount of gold larger than in rainy season. If they found gold in large quantity, they should work 24 - 36 hours without sleep. In their believe gold is a magical thing. It is a sign from God that they should work harder. They just take a rest for a few moments.

Health and Safety (H&S) Issues

In fact, there is no data indicating significant adverse impact against people's health. It means that there is no significant number of cases of fatality and epidemy. There are many explanation to answer these problems. First, government lack of professional to manage and monitor what has happened in their people. It is common in developing country like in Indonesia, government is too busy and looks like over load with their daily activities. Second, these problems has no big concern with many people and neither government. They usually do what their ancestor do before, they live like as usual and they never see the out of the ordinary event in their livelyhood. Third, they do not

understand why they have to search data about them. They only knew statistical data concern family planning is useful. Because government was very endorse to get it. However, most of them (government apparatus and also miners) do not understand the usefulness of recorded data about accident or other happens in mining communities, yet, in their mind “what for ?” Fourth, mining communities’ activities is a dynamic ones. There are many people back and fourth from the areas to outside and on the other hand; and many groups can move from one place to another faster than be calculated by government.

Unsafe & Unhealthy behavior

As mentioned above, miners protect themselves less of standard for safety.

Never use diving equipment except oxygen mask, rarely use gloves while working, do not protect their body with wire or anything else while they are diving in the bottom of river, tend to under estimate about the broken down possibility of pit hill, their skin contacts with mercury directly and some of them take a breath in a room that full of smoke from cigarette and burned mercury.



They always do like these from day to day, without worry about working accident, fatality or in long run impact.

Perhaps, the miners do not matter with the noise of machines. However as long as 6 - 8 hours every day (at least) their hears are vibrated by the mechanical sound. They never use the ear caps, because they do not worry about the impact of it.

Filtering the gold, they usually sit down on the side of the river, crossing their leg while some of their body submerged in the water river. They are sure that this position is ergonomic and restrain the back ache and ease to pick the sand without do many bows. So that many of them get some dermatophyd bacteria and other skin problem especially on their leg. Their palm of foot get wrinkled and easy to hurt while stepping on the stone or wood around there.

For some cases, many of them drink the river water by their hand without filter, and cook something/ food which mixed by river water devoid of making it sure that it is hygienic or not. They though that these conducts have been a common habits since their parents daily life. They do not worry about water

quality that has been contaminated by mercury, cyanide, poison, or bacteria. Some of the miners are in using river water to go to upper course, but most of them just take and utilize the water nearby their working activities. Moreover, they can get much water through water pump which normally used to suck a mud and sand. This water is used for bathing, drinking, and cooking by miners.

A like as SSM area inlarge, they consume a bulky food for building and maintaining their energy, but they never though about nutrient. In a plate, a huge of rice is coloured by salted fishes and some of chilly. These are their special menu almost everyday. Besides the head of group/ owner's manage the cost efficiently, their belief remind them that salted fish is a good thing to build energy and to protect thei body from sickness.

Miners do not worry about mercury that will impact for their health. They put altogether mercury bottles, plastic bowl and glass for drinking side by side, and then they ease to sleep beside them



They consume much coffee and also alcohol without balancing by nutrient and enough plain water. Every miners can usually consume about 3 – 5 cups of coffee or a certain group can drink about 2 - 3 bottles of TOMI everyday. They have many reasons to justify their habits; to kill the freeze, to endorse energy, and to avoid sickness. In fact, they get sick rarely especially when they produce much gold. They always think that they are in fit condition. So that, they never consider about their behavior in mining is not good for their future health.

If some of them get sick they usually think that it come from invisible creature, they tend to see a psychic (dukun) than see a doctor. However, when a nurse who lives in surrounding Kelian River come to location they usually feel not in good condition and ask her be injects them. They trust on nurse. Unfortunately, it is also no have adequate data to describe how many cases which happens for ex miners that get sick or problem with their health. It is needed a certain research because the ex miners are separated largely in many location of Kalimantan and it could be in Java and Sulawesi too.

In rainy seasons, usually on October – May, river surface is increased, water river become dirtier and its deluge is heavier than usual. Many of miners stop their activity exploring the gold, but there are many still stay and wait for work in their liners. As state above, the miners are the people that have low knowledge and education background, they do not care about H&S. In reality, they are fit enough and have no problem doing unsafe or unhealthy behavior like those above. Even they hear that in mining area there are so many waste and poison that can influence the people's healthy in there, they are still no worry. According to the people in Kelian: "It is better to take part in mining rather than only being a spectator and gets mining waste"

Admittance of the miners, “diving” is a heaviest mining activity. This work needs a strong physic qualification. Diving has been done by all workers; adult, child, man, or woman. Physically fatigue is a major moan/ sighs from child labor, but to kill it they usually consume energy supplement. Especially, in “mopo” time, they work without rest. In their eagerness to labor they do not feel tired or fatigue. However, soon, they feel very tired, but the money that will be received eliminated it.

Impact for children

The impact for children can be separated in two clusters. First, we categorize children as a common meaning and second, children as a labor. In first meaning, a like any other place of villages around the world, children play in the surrounding areas. They usually play in the river/ sub river every afternoon; they swim and pretend look for a piece of gold. Seldom, they get it, but sometimes they catch some small balls of mercury. They keep in play with them before they are disposed. Despite playing that ball in their hand, rarely, they insert it in their mouth and then spurt it out.

There is no correct data that can explain child labor exactly. Yet, according to the data of Anthropology Laboratory – Universitas Indonesia, it is about 10 % of the miners are persons who are ages less than 17 years old. For some children enjoy their work as interesting as a game, feel happy when they get money, and can eat as satisfying as they can. At glance they look like adult, but if we interact with them closer we will find that they are still young or not mature. Working in this area could make impact for them such as bellows;

Physically ; it is a dangerous job for minors because they have slightly experiences in knowing and understanding what kind of signal mean danger. A hill of pit made by sucking pipe is fragile and easy to collapse. In addition, in extensive times their body is still wet, it affects their internal metabolism. Even though, it is not always happen, as the divers water pressure causes them to bleed their nose, ears & event mouth. Yet, it is usually occurs to new ones.

Maturity : children live together with adults and they follow what the adults do such as smoking, drinking, and some of them are even exposed to pornography. In leisure time, some of the children come to the cafe located in the village. Music, games and also prostitution can be found easily. There is no regulation for them regarding those “entertainment” & even children can enjoy them. The important thing is, “you can pay”.

Psychic : They leave school but they know earlier about money – short time thinking. If they have money they can do anything. They only try to improve their skill but forget to enrich their knowledge. There are four major social problems related to education; a few teachers, less of teacher attendance, low eagerness to finance their child education and less motivation to endorse child involve in education.

Sociability : for this case, there is no problem with them to interact with the other. Yet, they know earlier how to work in group, the benefits if they work together, and how to manage the complicated task. Perhaps, it is the real positive impact for them beside gives some money for their parents.

Government Interest

For some places just like in Kelian Dalam, there is not enough government attention to or intervention in community activities. Regulation has usually been made for a response to many complaints from society, businessman or others. The government regulation in seeking gold in Kalimantan Timur (East Kalimantan) issued in 2001 intended to manage the SSM. It has an article that control people mining “People Mining Region” – *Wilayah Penambangan Rakyat*. However, it looks like a regulation that concern toward big company or good image of Kalimantan Timur than the seriousness to increase community miner’s welfare or H&S. People can see the implication of this regulation is to control people outside East Kalimantan who want to participate in SSM in this region. Indeed, it was happen just in previous stage after be issued. Then times later, they forget to monitor and control them. Many new comers come from outside take participation in SSM in some places of East Kalimantan. In lower level of government, village’s administration can not make any regulation of it, such as allocation of mining spot or formal contribution for village, they can not make it.

Nevertheless, village’s regulation had been issued since 1998, that there was an obligation for every unit to share Rp 25.000,- to village administrator monthly. This was operated about two years only. This regulation has never been worked anymore since gold finding there decreased dramatically until 90 %.

Shortly, we can say that there is no government policy for people mining in Kelian Dalam, especially from village administration. In fact, miners need mutual agreement with other group of miners. Less of regulations like this have increased mining activities uncontrollable. Many of multitudes of mud and sand can be found as long as Kelian River side. Many of wall river has been broken down or damaged caused by their behavior. However, mercury waste can not be found easily in the river, because the water river stream it out or some of them being sink in the bottom of the river.

At least we find there are three kinds of government concerns regarding health and safety atmosphere for mining communities:

1. Government does not understand what’s going on. Apparatus have lack of knowledge about it. So, they really do not concern about these issues. The causal factors of it are ;
 - a. Mining communities areas are far away from the Province or Regency. It is not easy to come there. From the center of East Kalimantan province (Samarinda) someone needs about 26 – 30 hours to come to Kelian Dalam by boat in one trip. From Kutai Barat Regency to location, people has to spend about 10 hours in one trip, and from Long Iram District, somebody needs about 4 hours.
 - b. People in those villages are living in bad condition; poor, many children are drop out from school and majority are familiar with hard work and dirty things. So that, worked for mining there is a solution.
 - c. Apparatus also live in not good condition too. They are still thinking about “any income for life struggle”. If they have sphere time, they

will do side job like trading. So that, they have little bit attention for their people.

2. Government tends to ignore what's happening. In positive thinking, we can say that they are too busy to do their daily activities. H&S in mining communities is not a serious concern; even it has not in their agenda, because there has not been a big tragedy there. However, on the other hand people can say that they really do not care about this activity. Because mining communities can give them some little money than they concern about big company or other business.
3. They do keep in touch with community miners about regulations only in mining area where nearby district area, such as in Samarinda, they protect area from new comers. However, they forget to implement seriously In other locations.

Some Boundaries Identification

To improve community awareness and also their behavior toward H&S, government has some burden. First, from their internal problem and second, from community miners limitation. Our data conclude that government has lacked of concern about mining communities. Some of people though, there is a suspicious perception that government apparatus take advantage too from these activities, actually for groups which produce much gold. Moreover, they do not care about H&S conditions in their neighboring include mining communities. A major reason which pronounced by government officer is the budget problem. They say that there is no finance allocation to conduct socialization about H&S to mining community. Nevertheless, we can not see their effort to look for it.

Instead of we stated above, the miners are not the lucky persons. They can not joint in a big company in Kalimantan, because the limitation of their knowledge, administrative or officially skill and also their attitude. So that, it's ordinarily, they tend to act practically in their life. They do every work which can not make a negative impact directly. They seldom, (if we can not say never) behave in strategic thinking. So it is a problem to enlighten them about H&S.

Other issue which has a contribution to increase miners' H&S behavior is the condition of "LOCAL POLITICAL CHANGE". Law No. 22 on Region Autonomus and Law No. 25/1999 on Fiscal Relations Between the Central and Local Governments and Government Regulation (PP) 104/200 (on percentage profit sharing, tax, profit, and royalty) further complicates problem for local government. On the practical level, administration is found to be weak and full of misuse. Aside from that, for the newly created regency, revenue for local budget is really crucial for regional development. As a new regency, Kutai Barat is still busy to manage itself. With limited officers who have competence, they are still full of activity in managing this new residence. Due to, H&S issue in mining community is not a significant concern.

Hazards and Potential Interventions in the Kelian Dalam SSM

Hazard category	Hazard description	Health and safety effects	Potential interventions
Accident hazards			
1. Buried down	The murky river water did not allow the divers to see the falling debris, even collapsing walls. The cramped pit walls, only 2-3 m diameter, did not allow divers to escape collapses.	Cripple, broken bone buried down alive, and death	Children or junior should not do diving alone in their early working times. Wear a strap around diver's waist that connected to his friend above.
2. Cutting	Sharp tools such as crowbar, knives, and nails can hurt hand, leg or other part of miners' body.	Cuts, scratches, wounds in fingers, arms, and legs.	Use protection tools such as gloves, long shirt and long pants, glasses, and shoes. Provide first-aid kit.
3. Machines	Caught in between by unguarded moving or in taking parts of machines.	Death, amputations, broken bones.	Children should not operate heavy machinery. Use suitable shirt and pants, gloves, glasses, and shoes. Regular machine maintenance.
Physical hazards			
1. Noise	Noise from the machines for hours	Hearing impairment, headaches, high blood pressure.	Purchase machines with noise control features, use ear-protector if needed.
2. Water	The dive is performed in water murky and contaminated by many pollution	Eye irritation, pulmonary infections, nose bleeding	Use glasses, ear protector and diving clothes.
	Water, sand and stones entering the hoses at high speed can injure the hands and feet of the diver holding the hoses. Water pressure when diving is often too hard	Injuries from stones, even loss of fingernails are common in the divers. Ear bleeding, deaf Nose bleeding	Use glove protection. Use diving clothes and ear protector.
	The workers are almost always soaked to the legs at work, only while they sleep can be dry	Skin diseases	To separate the shirt and pant which are for diving and which are not
Chemical hazards			

Hazard category	Hazard description	Health and safety effects	Potential interventions
1. Mercury	Exposed to mercury. Skin absorption: mercury often used to process gold with bare hands. Ingestion of mercury if eating or drinking because it also used and thrown away in the river Inhalation of mercury when the puya' is burned to remove mercury from gold	Poisoning, minamata syndrome, nerve disorders, brain damage Poisoning, minamata syndrome, nerve disorders, brain damage	Children should strictly not use mercury. Carefully use of mercury: gloves and eye-protector. Regulation on mercury distribution, put warning in mercury's batch or sachets <i>Children should strictly not use mercury. Carefully use of mercury: mask, gloves and eye-protector. Regulation on mercury distribution, put warning in mercury's batch or sachets</i>
Ergonomics hazards 1. Heavy lifting, carrying, moving 2. Repetitive movements and forceful tasks	Lifting, moving, carrying heavy items such as machines, stones and soil materials. Frequent flexing and extending arms and wrists when transfer puya' from water to the raft	Fatigue Back injuries. Low-back pain. Strains and sprain in hands arms, shoulders, legs and knees, tendon related disorders. Carpal tunnel syndrome.	Children should not lift or move heavy loads. Use carts and other lifting aids. Train safe lifting techniques. Design the work management which can decrease these hazards. Miners has to practice a gymnastic.
Psychosocial hazards 1. Uncertainty in income 2. Money and adult environment 3. Alcoholism, drug and smoking	Working everyday but find gold only by fortune, there's unpredictable 'season' for gold to be harvested Child workers receive same payment as adult. Being with adults in their environment, child workers follow the adult	Gambling, debt with high-interest Early stage consumerism, under 18 marriage, disincentive to education Addiction, lung and respiratory disorder Uncontrolled	Government has to find some alternative economic sources Enhances motivation to education and of course increase and develop of education quality and quantity Awareness on alcohol and drugs addiction

Hazard category	Hazard description	Health and safety effects	Potential interventions
	habits in smoking, drinking and consuming supplement tablets	behaviors Side effects of drugs	
Biological hazards			
1. Insects	Bites and stings from mosquitoes, bees, flies, cockroaches, ants	Malaria, dengue fever, skin irritation. Tetanus, leptospyrosis.	Sanitation improvement. Good housekeeping practices.
2. Bacteria, fungi	Dirt and soaked in the water and then sweating while working serve to an ideal condition for bacteria and fungi to grow	Diarrhea. Skin diseases	Use clean water and antiseptic soap after work

Be adapted from internal documentation of Antropology Laboratory – FISIP UI and has been adjusted

Conclusion and Some Alternatives

The miners in Kelian Dalam has been working in unhealth and unsafety conditions. They behave from day to day without any improvement of awareness and attention to H&S. Government lack of concern to H&S in mining communities caused by : their apparatus keep busy in their daily business, they have a little knowledge about H&S, and also the location is faraway from central of regency or district government. Nevertheles, it will be a quandary situation for officer to socialize H&S to mining communities. In one side government tend to chategorized this one as illegal activities, but another side, government has an obligation caring and maintaining their people welfare including health and safety condition. If it is arranged by government regulation, it will mean that government legitimate these acitivities and it will produce some consequencies. Many people will be doubfull about Government policy and it force the new locations of people mining.

Today, many of miners' group are not in good conditions. They get less of gold than 5 gram each day operation. It means; loss or break event point only. H&S issue will increase the cost of production directly. If this regulation is regulated, it will become more inconvenience for them. Cost of production will increase automatically.

Considering above, to improve the H&S condition for mining communities should be addressed in many ways like below :

1. Government has to has a strategic planning for SSM. To solve the problems of SSM include H&S issue closely related by the government's blue print of development. One of the most important thing to do in the

strategic planning is to agreed upon success indicators, that will be used in the monitoring and evaluation phase. The indicators must be concise as well as measurable. It must also be noted that the indicators will be in the forms of input, process, output, and outcome ones. Input and process indicators mostly be used in monitoring phase, while output and outcome indicators will be used to measure the success in evaluation phase.

2. To know better for H&S issue progress, It is urgent for government to conduct an immediate comprehensive, multidisciplinary, and cooperative research on the SSM situation and the environment condition nearby location. The nature and the goal of the research is predict the river and environment pollution, the number of accidental cases, and the impact for environment and also ex of miners. Of course, this research will give some inputs to improve miners' welfare.
3. Because the government officer has lack of knowledge and concern toward this matter, it is needed to conduct that some projects/ seminars to socialized this issue for government apparatus. These are not only be held in district level but it is better if be managed in national and region level too.
4. Dissemination of this information to the miners needs some actors involvement; government officer, NGO, community leader, and also medical workers such as doctor and nurse.
5. Considering the uncertainty income through SSM, government has to offer some alternatives economic sources. It will reduce the demand for being a miners, and indirectly it will increase the miners' awareness and concern about H&S.
6. It is usefull to conduct a need assessment from mining communities about what is they really need from government. The needs assessments must also consider dynamic aspects of the community and therefore can be used for at least five years. The assessments must also seek to understand the needs of all community groups, not particular ones. From this project, government will get the appropriate intervention.
7. Government has to monitor and control SSM progress through regular meeting, visiting or gettting report from the heads of miners or the head of communities. Beside a consequencey of strategic planning on SSM, this program will be directly increase the awareness and concern of mining community toward H&S issue.

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