

VULNERABLE LIVELIHOOD AND RUBY MINING: A CASE STUDY OF RUBY MINING AREA IN MOGOK TOWNSHIP, MANDALAY REGION

Khin Phyo Wai¹

Abstract

Livelihoods encompass how different people make a living depending on where they live. Livelihood system which is sustainable or vulnerable can be determined based on the degree of resilience and sensitivity. Ruby mining in Bawlonegyi village is facing with challenges in livelihood. This study aims to investigate the vulnerability of livelihoods in ruby mining community. The specific objectives are to illustrate the consequences of ruby mining that generated vulnerable livelihood condition and to analyze households' livelihood strategies that are coping local people. In this research, qualitative research method especially ethnographic research approach was mainly applied. In collecting ethnographic data, research methods such as observation, participant observation, key informant interview (KII) and in-depth interview (IDI) were used. Research subjects are the village abbot, village heads, village elders, local people who conducted various economic activities and other knowledgeable persons who can explain about necessary data. This research was conducted from 2019 to 2022. Although the locals could operate small-scale ruby mining freely prior to 1962 in earthen pit, in later times they could no longer mine freely. In 1991, small-scale mining permits were granted and after 2006, the large-scale mining was granted a permit due to the policy changes. Because of these conditions, locals faced with difficulties in their traditional livelihoods. Thus, local coped with various livelihood strategies such as diversification of economic activities, migration, agriculture and also investment in education for their future generations.

Keywords: small-scale ruby mining, large-scale ruby mining, vulnerable livelihood, livelihood strategy, migration, agriculture, education

Introduction

Livelihood study is a unique starting point for an integrated analysis of complex and highly dynamic rural contexts. Livelihoods encompass how different people make a living depending on where they live (Scoones, 2009). Livelihood system which is sustainable or vulnerable can be determined based on the degree of resilience and sensitivity. The most robust livelihood system is one displaying high resilience and low sensitivity while the most vulnerable displays low resilience and high sensitivity (Ellis, 1998). According to Carney (1998) stated that a livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base. Whereas vulnerable livelihood is related to insecurity, sensitivity of well-being in the face of a changing environment, and households' resilience and ability to respond to risks and negative changes (economic, environmental, social or political, including shocks, trends and seasonal cycles) and to opportunities (Rakodi, 1999).

Households aim at livelihood which has high resilience and low sensitivity to shocks and stresses. Therefore, Carter (1997) claimed that risk management and coping are complementary way for survival, the first act as an ex-ante income management and the second as ex-post consumption management in the wake of crisis. Households manage their livelihoods with variety of management options such as investment in securing more of an asset, substitution of

¹ Department of Anthropology, University of Mandalay

one asset for another, disposal and sacrifice. Moreover, Ellis (1998) consider diversification as one of the livelihood strategies of rural households in developing countries. Livelihood diversity contributes to the sustainability of rural livelihood because it improves long-run resilience and flexibility in the face of diverse trends or sudden shocks.

Mining sector contributes significantly to national and local economic development through employment, generation of foreign exchange, income and infrastructure development especially in developed countries. However, many of the world's poorer nations have not improved (World Bank, 1992). Several studies show that a greater percentage of the population are living below the poverty line in mineral-dependent countries specifically in developing countries. Moreover, mining activities often left ghost towns or depressed local economies as mineral production shifts from one place to another (Holden and Jacobson, 2012). Myanmar is also a developing country and its mining operations have been carried out with the aim to achieve development. In 1995, the government prescribed "Myanmar Gemstone Law" and created the opportunities for private capital investment. Thus, locals are facing the challenges in their traditional livelihoods as the result of large-scale mining. In this research, the vulnerability of livelihoods in ruby mining community would be examined based on a case of ruby mining village called Bawlongeyi Village which is situated in Mogok Township, Mandalay Region. The objectives of the research are to illustrate the consequences of ruby mining that generated vulnerable livelihood condition and to analyze households' livelihood strategies that are coping local people. In this research, research methods and village's ruby mining conditions are explained firstly. After then, the role of religion and locals' attitudes to ruby mining are illustrated under the title "Religion as a mechanism for successful ruby mining". And then, the researcher analyzed the patterns of vulnerable livelihood conditions and the impact of large-scale mining on local miners. Furthermore, coping strategies of local are demonstrated under three sub-titles and finally, it will offer some discussion and conclusion dealing with research findings.

Materials and Methods

The aim of this research is to investigate the vulnerability of livelihoods in ruby mining community called Bawlongeyi Village, Mogok Township, Mandalay Region. Although locals are facing vulnerability in many sectors such as culture, environment and economy, this study would like to focus on the economic vulnerability. Total household of research area is 344 households and its population has 1144 persons above 18 and 603 persons under 18. Among them, researcher chose 35 persons as the informants who are above the age of 18. As adulthood in Myanmar standardizes who is above the age of 18 years, researcher divided the informant by the ages of 18. Research subjects are the village abbot, village heads, village elders, local people who conducted various economic activities and other knowledgeable persons who can explain about necessary data. In this research, qualitative research method especially ethnographic research approach was mainly applied. Ethnography is an invaluable tool for in-depth understanding of livelihood conditions and it provides the historical depth and contextual insight necessary to comprehend the multiple factors involved in livelihood decisions. In collecting ethnographic data, research methods such as observation, participant observation, key informant interview (KII) and in-depth interview (IDI) were used. Researcher conducted observation in every field study. Through observation, the locals' type of dwellings, the conditions of picking mine tailings, and small-scale mining operations were observed. Most of the locals' dwellings were found as

two-story teak houses including furniture such as TVs, motorcycles, hand phones, water tanks, and washrooms and thus it was initially assumed that the locals were financially well-off. However, through subsequent participant observation and interviewing, researcher empirically found out the hardship of local's livelihood. Locals are struggling for their survival.

The total number of seven informants were selected for key informant interview in order to get the overview of socio-economic conditions and also 29 informants were selected for in-depth interview. The aim of using in-depth interview is to reveal the specific information related to each sector. Research questions were semi-structured and then developed more detail questions based on the responses to these initial questions. Some of the semi-structured questions are- what is their traditional livelihood? What are the impacts of large-scale mining on local miners? And how do locals cope their livelihood difficulties? In addition to fieldwork, online system such as phone call, viber and messenger was utilized throughout the duration of this research.

The collected data was analyzed by using the coding and memoing process of Emerson, et al. (2011). The process conducted by seven steps as follow: first, the researcher read the fieldnotes as a data set, second, the researcher performed open coding, writing code memos in third step, and then selecting themes based on the code memos. As the fifth step, researcher served focused coding and integrative memos conducted in step six. Finally, researcher tried to create concepts and theory that reflected the fieldnotes. This research highlighted vulnerable livelihood condition of small-scale mining, the impacts of large-scale mining to be more vulnerable for local miners and then alternative livelihood strategies of local people. This research was conducted from 2019 to 2022.

Ruby Mining in Bawlonegyi Village

Mogok Township is the place where the majority of the world-class pigeon blood rubies are found. It is famous as Ruby Land not only in Myanmar but also in the World (Newman, 2018). There are over 40 gem deposits and 500 mining operations (gem blocks) in Mogok Township (Ring, 2018). There are 17 gem deposits out of them where high-quality ruby can be found. Bawlonegyi Village is one of those 17 gem deposits. Ruby mining business of Bawlonegyi village is older than the age of that village. This is because when the history of the village is studied, it was not in existence as a village until 1880. That area was very convenient as it has not only gems but also water. Thus, the villagers from nearby villages came and built temporary huts to mine. And then, more other miners gradually settled down and the population growth led to the establish of Bawlonegyi village in 1890. Thus, ruby mining operations especially small-scale mining has been carried out by local residents over a century in that area. And it has been changed into various forms depending on the trend of state and changing policies.

Before 1962, locals have been carried out freely independent (small-scale) ruby mining without any control in the vacant land. For local, vacant land can be considered as gem blocks because ruby mining was operated in that land. In the past local small-scale mining grouped in four to five people and mined in areas where they felt could be successful. Local used traditional self-made tools such as mattock, hoe and bamboo to mine through human labor. Only hands were applied, they had toiled steadily and strenuously. Mining disturbed underground water vein and

water leaks. Thus, local stopped ruby mining in the rainy season. They resumed mining when water dried up in the cold and hot seasons. Although small-scale mining was a seasonal job, locals did not have to worry much for rainy season. In regular, one day of work could cover the cost for food a whole week long. Therefore, people were not very serious about ruby mining as little work provided a more than decent income. During this period, there were no formal regulations and operated by their traditional rules of game.

Between 1962 and 1990, ruby mining was led by the government. During that period, the locals were not allowed to mine, thus locals faced with challenges in their livelihoods. Illegal mining became common as people had been heavily relying on mining for so long. It was done in the forest where such mining could not be seen by government official at night. In 1991, the government permitted the locals to undertake small-scale mining on their own land. Therefore, locals who lived in lowland areas move their home to the highland near the foothill. This is because of their local knowledge that ruby could be found in ravines, streams and lowlands. During this period, they accelerated mining by adding machine such as water pump into traditional self-made tools. In this way, local expanded the number of operated gem blocks by hiring miners and also could run the whole year. In 1995, the government prescribed Myanmar Gemstone Law (no. 8/95) and granted permission for large-scale mining not only local but also foreign mining companies. But locals cannot afford to apply it. Moreover, the blocks near ravines and streams are assigned as fields. As a result, they failed to manage in ravines and streams. Thus, locals suffered a lack of opportunities for gem blocks. Although small-scale operations were available for application, the number of people who applied decreased because of the rise in investment costs and decline in ruby yields. As gems are the non-renewable resources, the gems from the soil and also vacant lands were gradually becoming rare around 2000s. Some of the local migrated to other areas where have many chances and low investment for mining. According to a 32-year-old local man states that;

" I ended up in ruby mining because the land we owned began yielding fewer ruby. I've been working in amber mining at Tanaing of Kachin State for nearly 7 years now. But the capital needed is also very high, it was impossible to do with the money I had. That is why I went to Tanaing to mine amber that doesn't need much capital."

But a foreign company named "Htay Paing" began large-scale mining near the village at the new mining site called quarrying (stone pit, tunneling inside the stone layer) in 2006. This operation utilizes heavy machinery and a great amount of manpower. As the company's permit expired in 2019, they have halted operations. At present, a few locals still continue small-scale mining by re-mining in the previously mined areas (see Fig-1). Whatever the small-scale mining conditions have been changed, the role of religion and locals' attitudes on ruby mining have not changed. It is explained in the following.



Figure 1. Re-mining in the previous mined area

Source. Photo by Researcher

Religion as a Mechanism for Successful Ruby Mining

Local people believe in Buddhism and Animism. They believe religion brings about good luck, peace and free from danger for their life. Ruby mining has been considered as karma business. It is believed that anyone who is fortunate can get rubies. To be fortunate locals have generously done religious activities such as offering alms-food and flowers, prayer and kowtow to the Buddha. Before they go into the mining operations, local always perform paying homage to Buddha at their home as their daily routines. Locals also recognize religion as a mechanism for mental care. When rubies are not mined and felt depression, they practice meditation and listen to sermons preached by Venerable Mogok Sayadaw¹. Locals reduce their stresses in these ways. Meditation retreats are found to be asylum for local people who ruby mining as their main source of livelihood. They pray to the ancestral spirits called *Yay-thain-nat* and *Boe-daw-sin-nat* (see Fig-2 & Fig-3) with the wish to run their business smoothly and free from danger in the working place. It is seen that such devotion leads to freedom from any danger and life loss in working place. Regarding this, a 55-year-old local woman said that,

“As getting big and good quality ruby depends on karma, we are mainly doing religious activities. We offer the buddha with food, flowers and holy water every day. We pray to Boe-daw-sin-nat and Yay-thain-nat in order to escape from danger at work.”

Villagers have actively performed religious activities. No matter how difficult in economy, they try to celebrate religious festivals such as Kathaina and ordination of monk. Each and every village has held the festival and Dhamma discourse pompously. Even a house is poor, they spend 6,000 to 15,000 MMK² for offering flowers at the shrine in a week in 2020 (See Fig- 4). According to an old man aged 75 also said,

“Those from our village stand first in religious devotion. In every house, flowers offered to the Buddha will not wilt, whether household members are penniless.”

¹ A famous Buddhist monk in Myanmar

² The currency code for Kyats

Sometimes, Dhamma discourses are competitive. When everybody is depressed for getting no rubies, they try to pacify themselves by paying heed to monks' sermons."

Ruby mining is done between two extremes of wealth and poverty. As ruby is uncertainly dug at underground, they work with conviction of 'boss or dog'. The meaning is he would become a boss if anyone get a ruby from testing pit, but he would be poor if he fails. Local people believe that those who are fortunate get fortune gem while those who are industrious can get effort gem. In order to be fortunate, locals use the words *kyauk-gyi-ya* (*kyauk-gyi* means big gem, *ya* means get) when they greet each other. Locals use this word not only for greeting but also for wishing to prosper by getting rubies. Concerning it, an abbot aged 54 said,

"Those who dig ruby in Mogok Township work it in the hope of do or die. The gem lying underground is vaguely dug. Although one gem block gets ruby and become wealthy, another one near it cannot get any. Anyone who is fortunate can get ruby. No guarantee in life. But, they work in the hope of lucky strike."

Local people accepted that gem is found through excavation of human resources. In the early years of 2006, local people dug ruby in earthen pits through small-scale mining. In doing so, when blocks were almost exhausted, they were worried about it. In 2006, ruby yielded when local started testing ruby mining in stone pits. Thus, ruby was mined in stone pits. When these were out of run, they aimed at mining in forests and mountains not only in Mogok Township but also in Moemeik Township. Dealing the aim, a man aged 57 said,

"In Mogok, so long as the earthen pits are dug and they are concerned about the exhaustion of pits. When stone pits are tested, rubies are found. So, they change ruby mining in stone pits. Gem is found through search from human resource. If no ruby is found from this village, anyone can dig in the forest. When there is no gem in Mogok, we would go to Moemeik and dig there."

This indicates locals were worried dealing with gem blocks in the past, but now they develop resilience and have no longer worried about it. Religion served as a mechanism for successful ruby mining among the people who practice it as their livelihood. Locals deeply believe that region brings about faith for good luck, peace of mind and free from danger for their daily life. They think that the religion contributes an instrumental tool for ruby mining.



Figure 2. Yay-thain-nat (ancestral spirit)
Source. Photo by Researcher



Figure 3. Boe-daw-sin-nat (ancestral spirit)
Source. Photo by Researcher



Figure 4. Shrine of a household
Source. Photo by Researcher

Ruby Mining as a Vulnerable Livelihood Conditions

Ruby mining which is the main livelihood of local was well-off and also the economic conditions was good before 2000. But along with the hardship of small-scale mining after 2000, locals faced with difficulties and uncertainty in their livelihoods. There are six main factors that are generating vulnerable livelihood condition such as non-renewable resources, the scarcity of vacant lands, no cultivation of crops in their farms, the domination of large-scale mining and unwillingness to work as wages laborers in large-scale mining, and no habit of investment and saving.

There are two reasons for the scarcity of vacant land for ruby mining. Firstly, as local people have worked only small-scale mining for their main livelihood over a century, gem blocks are scarce enough. Second is the designation of “Tea Land from Ruby Land” in 2005 by the government. Thus, locals had to choose vacant land on a first come first served basis and grow tea. But locals lack of interest in tea growing and it led to halting after merely a year. Thus, local faced with the scarcity of vacant land for ruby mining. While traditional mining has been done in streams and ravines previously, it can no longer be done in those places. The owner of the lands near those areas forbids for mining there. Growing tea project was not successful but it encouraged local economy to be more vulnerable. According to the local man who aged 56 years old said,

“Tea plantation project served as a factor for economic difficulty including our village entire Mogok Township. As we have never done agriculture, we do not know well how to cultivate. No one wants to do it. Thus, we decided to dig ruby again. At that time, we have no more vacant lands to mine. Every land has its ownership. When we mined at streams and ravines, the owner beside of those places forbids. That is why, all of locals are facing difficulty with their own lands.”

The consequence of tea plantation project resulted in the scarcity of vacant lands and it led to economic insecurity.

Plots of land where tea leaves were grown were assigned as their own. In 2012, the department of agriculture managed those lands to be Form-7¹. Although Form-7 was put down, there were weak points in field check on the cultivated conditions of agriculture. Local also did not cultivate in their own lands. On the other hand, ruby mining could not be done. If locals wanted to operate ruby mining, they needed to reapply Form-14² and they could do when they got permission. But locals could not afford. Therefore, some locals wanted to sell their lands to entrepreneurs while other aim to mine by their own if they have enough capital. In addition, there were also some locals who wanted to operate ruby mining in corporation with company if given permission by upcoming law. Concerning this a 65-year-old man stated that;

“I have 5 acres of farm land. As I don’t want to do agriculture and cultivate any crops, the land is just fallow. I have no plan to cultivate in future. If I have a right to mine, I will do by myself. Or if I don’t have capital, I will sell the land or I will mine together with company.”

It can be concluded that locals are facing with economic difficulties as they are solely depending on ruby mining and they did not use their farm lands for agriculture.

In 2006, there were many job opportunities emerged because of the allowance of large-scale mining in stone pit. But most of the locals did not want to work in that company and only a few worked. The reason is that the company lacks of transparency in gem appraisals and bias.

Most of the men moved to other places in order to operate mining. The women and other family members conducted picking mine tailings in the discarded stones by mining company. It was the main economic activity during large-scale mining operations. Despite this job was the most fruitful during this period, it was no longer fruitful when the mining halted. Regarding this, a 51-year-old local man said that;

“When I worked at company, I earned about 300,000 MMK for a period of gem appraisal (3 months). At that day manager called me and said that you cannot work as a foreman anymore and you can do as a follower (miner). The next day, manager appointed a person who is partnered with him as a foreman. That is why I dropped out that job.”

Ruby mining is a daily activity but it does not get daily income. In the early period of 2000, it was very easy to earn because rubies were produced in abundance. At that time, one of the locals’ assumptions is that mining would guarantee a sustainable income. Most of the locals sell the ruby immediately after they have mined. This was due to the belief if the miners sold the gem immediately, the gem brokers would compete and give the higher price with each other. They are deeply accepted the notion that money can always get from ruby mining. Therefore, local use amply most of their earning and they did not have the idea to invest in other economic activities and saving for their future survival. Although some invested in other economic activities such as grocery store, food business and transportation job. But these activities can no longer consider as sustainable livelihood because of largely depended upon the large-scale mining business. In addition, a few have saving habit but they did not save ruby. They bought gold as saving. But they sold and used it when they did not get any ruby. Therefore, locals explained their situations as “they get, they consume, they used, they run out”. As a result, locals

¹ Land Use Certificate (LUC)

² Application for farmland to be used for other purposes

are facing with livelihood difficulty when ruby mining is not convenient. A 65-year-old local man mentioned that;

“Since our business is a karma business, although we invest a lot of capital, we only get ruby if we are lucky. Thus, we have to work with the hope despite we are poor today, we can become rich tomorrow. In the past, rubies are abundant and we traditionally accepted the notion that “we always get money through ruby mining”. There was no investment or saving for survival. Thus, we get, we consume, we use and run out, we have been living like that. When traditional ruby mining was not working well, we all are struggling for our survival.”

Therefore, ruby mining which is the livelihood of local people are facing with scarcity of blocks and gems. Locals assumed that they can no longer depend on ruby mining as their income sources. As a consequence, locals are coping these conditions by using alternative livelihood strategies such as migration, agriculture and investment in education.

Livelihood Strategies

There are three strategies that are applying to escape from vulnerable livelihood. Firstly, locals practice migration as a mechanism to cope the current vulnerable livelihood conditions. Secondly, local residents are engaging agricultural activities not only to solve the current vulnerable livelihood conditions but also to create the sustainable livelihood for the next generations. Lastly, local residents changed the perception on education and deeply accepted education is another source of the sustainable livelihood options for their future generation.

Migration as an Alternative Livelihood Strategy

When studied the history of migration in Bawlonegyi village, there were in-migration, out-migration and sometimes both in and out-migration simultaneously was occurred. Before 1962, small-scale ruby mining could be carried freely. Thus, there are many in-migrant workers in the village. But, between 1962 and 1994, local migrated to other places because of the hardship of ruby mining in their village. Again, after 1994 and 2006, in-migration in the village was found because of the permission of small-scale mining and large-sale mining. Although in-migration had been taken place in the village, out-migration was also found there. Locals could no longer rely on ruby mining as their main livelihood. That is why, there were the scarcity of ruby and vacant lands and the domination of large-scale mining in their village. Therefore, some of the local especially men migrated to other places for their livelihood. Most of them went to other areas that produced gemstones such as Hpakant, Tanaing and Moemeik in order to earn capital. They operated mining as their own business. There were also a few people who migrated to abroad and worked as wages labor. During this period only young men migrated and they were the age between 18 and 35 years.

After the cessation of large-scale mining operation in 2019 many of the local moved to other regions not only local but also abroad. Most of them went to the border areas of Myanmar and China such as Shweli, Mangshi and Kyalgaung. In addition, some are migrated to Malaysia, Thailand and Dubai. In choosing places, they have relatives and friends who have been living in those places. They go and work in group. Most of who are the age between 18 and 40 years old,

both male and female, not only married but also unmarried. According to the saying of local “there are about 60% of local between 18 and 40 years old are working abroad currently”. Grandparents take the responsibility of caring grandchild because of the migration of offspring. Regarding this, a 56-year-old local resident woman states that;

“Almost all people who can work go to China after 2019. We have only left the people who cannot work; elder, unhealthy person and children. If there are three people who can work at a home, two people are going to other places to work. Grandparents are taking care of their grandchildren as their offspring are going out to China for earning. It’s not easy, whenever I think about the long term, I am worry for our conditions.”

They work in the service activities such as waiter, washerwoman, tailor, coolie and so on. Their average earning was between 5 lakhs to 10 lakhs (MMK) per month in 2020. Local assumed that they can get regular incomes by working as wages labor. Migrant people sent back some amounts of remittances for the household consumption at the end of the month. The rest of the income save for their children education. The people who are living in their village have no job in mining. As other work unavailable, the older women continued picking mine tailings with the belief if they are lucky they can become rich (see Fig-5). They can only earn about 500 MMK per night from 6 pm to 9 pm in 2020. Because of such conditions, locals thought they cannot survive through ruby mining in their village. According to a 61-year-old man said that;

“I have no hope to do business by living there. Because the blocks are scare and only left the blocks that are difficult to mine. In future, we will go and work as wages labor for our survival.”

Thus, locals always engage in migration at the time of hardship in traditional economy. It can be concluded remittance is the source of income and household consumption are depended on it. Thus, migrant remittances help not only with *consumption*, but can act a form of insurance for households which are facing income difficulties and livelihood insecurity. Alternatively, it can also consider as a survival strategy of local people. In addition, locals invest some of the remittance for their children education. Therefore, migration can also be considered as a part of sustainable livelihood development for future generations.



Figure 5: Women are picking mine tailings at night

Source: Photo by Researcher

Agricultural Activities as a Sustainable Livelihoods

Taungya cultivation and ruby mining are traditional economic activities of local people living in Bawlongeyi village. Its cultivation aims at subsistence purpose for their family and their main occupation is ruby mining. But, they no longer managed it because of ample rubies, instant profits and weariness of *Taungya* cultivation. After 1940s, most of the locals had been done only ruby mine. A few hobby farmers continued cultivation for subsistence purpose. They cultivate seasonal crops within their homes and the lands where they can get water. The seasonal crops such as beans, mustard, chayote, rice and wheat are growing (see Fig-6).

In 2005, the government designated Mogok Township, including Bawlongeyi Village as "Tea Land from Ruby Land". They were encouraged to grow tea plants by the administrators. Each household grew up to two to three acres of tea. It is difficult and tiring as farming was done by hand using knives, pickaxes, and hoes, and as there was a lack of farming expertise. As the locals had been mining ruby for generations, they were not accustomed to agricultural work. The locals lacked of interest in tea growing. On the other hand, the staffs of government did not carry out field checks. Therefore, it led to halting of tea growing after merely a year. Eventually there was no replanting or maintenance of the tea plants. Thus, the growing tea project was not successful. Regarding this, a 51-year-old local man states that,

"In 2005, there was a project that aimed to change Mogok township from the Ruby Land to the Tea Land and the government mandated every household to grow tea plants. The entire village had to grab nearby land and grow it. But we only grew it for about a year. Later on, no one continued tea cultivation as they were tired of it, so they abandoned the tea fields and mined again."

The locals consider the project as a one that did not aim to provide an additional economic activity for them. It was not fixed in the interest of the locals. They were not interested in any agricultural activity including tea cultivation. They also thought as a mere perfunctory order of the government. The reason was that the order to cultivate tea was given without any systematic field checks. The result of this project was the reduction of vacant land where local ruby mine. Plots of land in which tea plants are grown are assigned to be their own. But, without growing any crop in the plots, they use as firewood orchards. After electricity has been lined in 2014, firewood had not been cut remain fallow. In 2012, the department of agriculture managed those lands to be Form-7. But, as most local people were unwilling to manage agriculture any longer, they remain fallow lands.

In 2006, as a large-scale ruby mining was permitted within the village grounds, the locals experienced difficulties in their small-scale ruby mining. Thus, a few people started to work in agricultural activity that profit as much as they invested. Regarding this change, a 60-year-old local man who works in agriculture states,

"A long time ago, I mined ruby. Now, it has become scarce and the company has entered. A lot of capital needs to get a gem block. Even if I invested, only really lucky people could find ruby. So I stopped ruby mining and started working in agriculture in 2008, where I could earn back as much as I invested."

In 2010, an agricultural expert from Department of Agriculture, Livestock and Irrigation, Mogok Township held a seminar in Bawlongeyi village. In this seminar, he was stated that, *"the*

natural resources especially gems both above and below the ground may be depleted one day. Thus, the villagers should work in agricultural activity as sustainable livelihood."

After this seminar, a few locals gradually became more interested in agriculture and began to think as *"it could provide sustainable livelihood and stable source of income in long term. By growing perennial crops, they could benefit and provide sustainable livelihood not only for them but also for their next generation"*. Thus, the former cultivators expanded their agricultural activities for commercial purpose. Although there were approximately 50 people who worked in agriculture before 2006, the number of households engaged in agriculture increased to 59 households. However, most of the villagers did not still interest in agriculture. According to a 65-year-old local man states that,

"In 2010, an agricultural expert from the township office came and said not to rely on underground resources and to work in agriculture during a seminar. In my opinion, growing perennial crops would help our posterity and in the long term it could provide a stable livelihood. I don't want to go another place to work like other people. I like farming peacefully with my family on my own land. Even if I don't become rich from farming, it guarantees my family's livelihood."

As arable lands lie on ridges, it is difficult to get water. Thus, they grow only perennial crops that do not require much water. The farmers are trying to provide water to the farms and are planning to implement an irrigation system. They hope that agriculture can provide regular income by growing both perennial and seasonal crops.

By looking at the agricultural activity, it can be analyzed that they did not interest in agriculture since the former time. The administrators wanted to change their economy from ruby mining to agriculture. This is because of the livelihood insecurity of ruby mining. Thus, they mandated to grow tea plant every household. But they did not design systematic plans such as educating locals about the benefit of tea plantations, discussing livelihood insecurity of ruby mining and listening the voice of the local people. Therefore, it did not succeed. Again, they held a seminar in Bawlongyi village and educated the consequences of ruby mining and agriculture. After this seminar, the locals became more interested in agriculture and began to cultivate perennial crops and trying to get water to grow seasonal crops. But there are still locals that do not interest in agriculture.



Figure 6. Wheat cultivation field

Source Photo by Researcher

Recognizing Education as a Pathway to Sustainable Livelihoods

Most of the local people have traditionally accepted education was not an important part of their lives and they can survive through ruby mining. This is because of the abundant of ruby and providing an income easily. In addition, they did not have much knowledge and narrow insights. Thus, they did not want to focus on their education. The majority of the children worked in their family mining operations. There were a few parents encouraged their children's education. But the children were not interested in education. Even who have graduated from university continued to operate ruby mining at their home. They believe that attending university is like fulfilling their parents' dream. Attending university is not a first priority and the work (ruby mining) is the first. No one thought and hoped they can face the difficulties in their ruby mining operations. Concerning the fact, an old man aged 84 said,

“As we had least knowledge and narrow insights, we did not know to learn and have education when I was young. The elder person supported that when you passed fourth standard, you would dig mine, the same goes to anyone who passed tenth standard. As we are young, we were deceived. We would like to mine as mining provides money easily.”

It can be analyzed that the lack of knowledge, narrow insights, plenty of ruby and heavily depended on ruby mining were the agents for the weakness of education.

Despite local people not only parents but also children changed the perception on the education as they are gradually facing the difficulties with the mining operations. They recognized educational job is the most reliable survival option for their future generations. In addition, local residents empirically understood the working situation between educated and non-educated person when large-scale mining came to exist in 2006. Thus, they realized that if they made a living with education, they could work in jobs that were less tiring. Both parents and children started focusing on education. Concerning the changes in perception on the education, a 58-year-old woman mentioned that;

“As I was not educated, I am contented with choosing Ge-sar thrown away by others. I am facing so many challenges with my livelihood. I sent my children to school so that they do not face hardship like me. Later, parents who are rich or poor let their children to attend school after they are thrift. Because they understand that education provides guarantee in life.”

Although the locals are facing with financial difficulties after 2019, the encouragement for education did not decrease. There are 10 to 15 students who passed matriculation examination annually after 2010. The number of graduated persons increased up to 40 between 2001 and 2020. And then graduated persons make a living with professional jobs such as banking, teacher at private school, and so on. In comparison to previous times, the education sector changed greatly. This finding can be analyzed that local residents deeply accepted education is a bridge to develop sustainable livelihood for their future generation.

Discussion

Mining areas face with constant poverty even in rich countries like Canada (Ross, 2001). Several studies show that a greater percentage of the population are living below the poverty line in mineral-dependent countries (Githiria and Onifade, 2020). Thus, mining and vulnerability are interrelated with one another. Moreover, the attitude of people encouraged to be more vulnerable livelihood conditions. In the finding of this study, the attitude and habit of local is selling ruby immediately. This was due to the belief if the miners sold the gem immediately, the gem brokers would compete and give the higher price with each other. They are deeply accepted the notion that money can always get from ruby mining. Thus, all of the earning spent for household consumption. They did not have the idea to invest in other economic activities and to save money for their future survival. Although some invested in other economic activities such as grocery store, food business and transportation job, these activities can no longer consider as sustainable livelihood because it is largely depended upon the ruby mining business. Thus, these activities declined when the mining company stopped in 2019. Some of the household has bought gold as saving. But the gold is sold again for household consumptions when they did not find any ruby. In this way, households' livelihoods are vulnerable to or in the process of a vicious spiral of impoverishment.

Vulnerable livelihood is related to insecurity, sensitivity of well-being in the face of a changing environment, and households' resilience and ability to respond to risks and negative changes and to opportunities (Rakodi, 1999). The people of Bawlongeyi village have conducted ruby mining as their traditional livelihood. Natural resources-based livelihood activity is itself a vulnerable and also accelerate by other factors such as political factors. Regarding the sustainable livelihood framework, ruby mining caused villagers to be vulnerable because ruby is a non-renewable resource and also the earning is irregular. This study found out that the important of government in the management of mining sectors. It needs to managed carefully in systematic ways. For instance, the government designated Mogok Township, including Bawlongeyi Village as "Tea Land from Ruby Land" in 2005 and encouraged the local to grow tea plants. The government aimed to develop sustainable livelihood for local residents who are heavily depended on ruby mining. It was not succeeded as locals lack of knowledge, narrow insights, lack of familiarity with agriculture along with the lack of educating by government. In 2012, Form-7 was given to the lands where tea was grown without field check. Despite, most of the locals did not cultivate any crops and cannot operate ruby mining. Such conditions led to the uncertainty in their traditional livelihoods.

Households aim at livelihood which has high resilience and low sensitivity to shocks and stresses. Individuals and households adjust to unpredictable circumstances, rather than 'strategies' planned in advance (Lockwood, 1997). Every household practiced risk management and coped in order to develop robust livelihood. Rakodi (1999) identified a variety of coping strategies such as substitution of one asset for another, investment in securing more of an asset, disposal and sacrifice. Local residents of Bawlongeyi village were facing with challenges in their traditional economic activity such as large expenses, scarcity of gems and gem blocks. Thus, a few locals tended to substitute it with agriculture. They were not interested in agriculture in former time, but now a few locals became more interested in agriculture and began to think as it could provide sustainable livelihood and stable source of income in long term. Therefore, they

cultivate perennial crops and trying to get water to grow seasonal crops and also expanded the cultivation from subsistence purpose to commercial purpose.

The second coping strategy of local residents is the investment in securing more of an asset. According to Ellis (1998) education is a key factor contributing to the greater ability of diversity for household. In the study area, most of the local people have traditionally accepted education was not an important part of their life and they can survive through ruby mining. But when they are gradually facing with difficulties in their mining operations, the perception on education had changed. Locals recognized educational job is the most reliable survival option for their future generations. Therefore, both parents and children started focusing on education. By investment in education, future generations could be engaged various economic activities and developed sustainable livelihood. It can be analyzed that locals tended to develop the sustainable livelihood which is based on human capital from the vulnerable livelihood which is depended on natural resources (capital).

The last coping strategy is migration. In the paper called “Remittances and sustainability of family livelihoods in Zimbabwe”, scholars contribute that remittance has positive impact on family livelihood. They spent more on investment rather than consumption (Mishi and Mudziwapasi, 2006). In this study, locals are coping their vulnerable livelihoods with migration. Local engaged in migration as the hardship of ruby mining and practiced both national and internal migration. The aim of migration is to collect money for their households’ consumption. Migrant workers send enough amount of money for household consumption every month. Thus, it reduces vulnerable conditions and served as a survival strategy. In addition, locals invest some of the remittance for their children education. Therefore, migration can also be considered as an aspect of sustainable livelihood development for future generations.

Livelihood diversity contributes to the sustainability of rural livelihood because it improves long-run resilience and flexibility in the face of diverse trends or sudden shocks (Ellis, 1999). Trend encouraged local people to diversify various economic activities such as grocery store, food business and transportation job and picking mine tailing. But these cannot contribute to sustainable livelihood because of their diversification that is dependent on the temporary nature of ruby mining. Although diversified economic activities went well during the time when the company still mined, it was no longer fruitful when the large-scale mining halted. It is contrast with the statement of scholar, diversification of local can only contribute short-run resilience for local livelihood. The contribution of this finding is livelihood diversity relied on the vulnerable nature could not develop the sustainable livelihood.

Conclusion

This research examined the vulnerability of livelihoods in ruby mining community based on a case of ruby mining village called Bawlongyi Village which is situated in Mogok Township, Mandalay Region. The traditional livelihood of this village is small-scale ruby mining and it has been carried out for over a century. They have been relying on natural resources as their main occupation for sustainable livelihood for so long. When studying the vulnerability of livelihoods in ruby mining community, it is found that the trends such as political and technological trends play an important role.

In political trend, before 1962, small-scale ruby mining was permitted to work freely and between 1962 and 1990, as they have no longer received permission and they had to work in illegal mines. Consequently, locals faced with challenges in their livelihoods. Thus, ruby mining was done in the forest where such mining could not be seen by government official at night. In 1991, small-scale ruby mining was permitted again to operate on their own lands. In addition, Myanmar Gemstone Law (no. 8/95) was prescribed and granted permission for large-scale mining in 1995. Large-scale mining permit was granted in 2006 but it was halted in 2019. Because of such political trends, local residents had been facing livelihood insecurity. In addition, technological trend is also influenced on vulnerability. Traditionally, as local miners used traditional self-made tools in small-scale mining, there was limited in extraction. And also locals stopped ruby mining in rainy season. Because of technological advancement, locals accelerated gem extraction by using water pump into traditional self-made tools. As a result, small-scale mining has changed from seasonal to year-round job. In addition, the consequence of applying heavy machinery and using a great amount of manpower in large-scale mining, there was no limited gem extraction. Thus, local are suffering the scarcity of gem blocks and gems.

In 2005, the government designated Mogok Township including Bawlongyi village as “Tea Land from Ruby Land” with aim to change livelihood from ruby mining to agriculture and were encouraged every household to grow tea plants. Even though such a plan was established, it was failed as there was no educating and not interesting in agriculture. But as a result, there was the scarcity of vacant lands for ruby mining. In addition, Form-7 was given to the lands where tea was grown in 2012. Although it was given Form-7, most of the locals did not cultivate any crops and also the official did not conduct the field check whether it is actually cultivated or not. There are a few households that grow for consumption, while most of the locals keep as fallow land. They can dig in those plots by re-application Form-14, but they cannot afford capital. Because of such conditions, locals faced with difficulties in their traditional business.

Although there were job opportunities in large-scale mining, local worked temporarily as the company lacks of transparency in gem appraisals and bias. Men migrated to other places within the country to operate mining and other went to abroad as wages labor. Then other family members worked in picking mine tailing, grocery store and food business and transportation job. During this period, while traditional economic activity faced with difficulties, locals’ economy was still well-off because of the diversification of various economic activities. But locals were rarely used to save and invest, they spent their incomes only for household consumption.

Large-scale mining was closed in 2019 and local did not have any income generating activities. Local faced with difficulties and 60% of working age between 18 to 40 years old both men and women migrated to abroad to do as wages labor. The sent back the remittance for household consumption at the end of the month. The people who wanted to live with their family in native village and hobby farmer operated agriculture for commercial purpose as an alternative livelihood strategy. In addition, because of the vulnerable nature of ruby mining, locals invest money for their children education with the believe that education provides guarantee in life. Although locals are coping the vulnerable livelihood with the above-mentioned strategies, they cannot effectively solve it. The government also needs to cooperate with local in order to develop sustainable livelihood strategies. For instance, the respective departments should invest time, systematically share knowledge, and work concretely towards implementing agricultural activities and livestock activities that are compatible with the region.

Acknowledgments

I would like to express my special appreciation of the Rector and Pro-Rectors of University of Mandalay for giving chance to submit this research paper. Then, I would like to express my gratitude to Dr Thandar Aye (Professor and Head, Department of Anthropology, University of Mandalay) for her insights and invaluable suggestions. Besides, I am deeply grateful to the locals of Bawlongeyi village who answered questions and helped me during the process of fieldwork.

References

- Carney, D, (1998) "Sustainable livelihoods. What differences can we make?" Papers presented at the Department for International Development's Natural Resources Advisers Conference, July 1998, DFID, London.
- Carter, M.R, (1997) "Environment, Technology, and the Social Articulation of Risk in West African Agriculture" *Economic Development and Cultural Change*, Vol.45, No.3, pp. 57-91.
- Ellis, F, (1998) "Household strategies and rural livelihood diversification" *The Journal of Development Studies*, Vol. 35, No. 1, pp. 1-38.
- Ellis, F, (1999) "Rural Livelihood Diversity in developing Countries: Evidence and Policy implications" Natural Resource Perspectives Number 40.
- Emerson, R. M., R. I. Fretz, and L. L. Shaw, (2011). Writing Ethnographic Fieldnotes. 2nd edition.
- Githiria,J., and M. Onifade, (2020) "The impact of mining on sustainable practices and the traditional culture of developing countries" *Journal of Environmental Studies and Sciences*.
- Holden, W, N., and R. D. Jacobson, (2012) "Mining and natural hazard vulnerability in the Philippines: digging to development or digging to disaster?".
- Lockwood, M. (1997) 'Reproduction and Poverty in Sub-Saharan Africa', IDS Bulletin 28 (3): 91–9.
- Mishi, S., and L. Mudziwapasi, (2006) "Remittances and sustainability of family livelihoods in Zimbabwe: Case study of Chegutu town. Working paper, Economic Research Southern Africa.
- Newman, M, (2018). Multifaceted: Governance and conflict risks in Myanmar's ruby industry. Natural Resources Governance Institute.
- Rakodi, C, (1999) "A Capital Assets Framework for Analysing Household Livelihood Strategies: Implications for Policy" *Development Policy Review*, Vol. 17, pp. 315-342.
- Ring, L, (2018). Accumulation by Dispossession and Local Livelihood Insecurity: A case study of Ruby Mining in Mogok, Myanmar. *Consortium of Development Studies in Southeast Asia Series*, Vol 17.
- Ross, M. L, (2001) "Extractive sectors and the poor. Oxfam America, Washington.
- Scoones, I, (2009). "Livelihood perspectives and rural development". *Journal of Peasant Studies*, 36(1), 171–196. <https://doi.org/10.1080/03066150902820503>.
- World Bank (1992) "Strategy for African mining." *World Bank Technical Paper Number 181*, Africa technical department series mining units, industry and energy division.