

ECONOMIC ACTIVITIES AND ENVIRONMENT IN KACHIN STATE, MYANMAR

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Abstract

This paper is consideration toward sustainable economic management for development and natural resources conservation to bring green, clean environment and stability of climate situation, recommendation bring to the peoples to keep rivers and forests of Kachin State. The damages such as social, environmental are throughout the state by the extensive and unsustainable mining includes problems to river ecosystems, mercury contamination, deforestation and social disintegration. A major aim is to focus on environmentally harmful and unsustainable resource extraction and to contribute knowledge and experience for development of the local people and the environment. Any mining, gold, amber and jade mining brings immediate wealth for some, but has serious long-term problems for people and environment. Today, the majority of the world's population lives in urban areas. Before the industrial age, cities for commercial trade and administration, but people resided in rural areas, engaging in mining, subsistence agriculture etc. Advances in technology from the industrial era created a highly productive sector: manufacturing. The focus shifted to meeting the needs of modern life but economic activities still depend upon natural environment. It needs to be highlight for sustainable development goal.

Keywords: *clean environment, conservation, development, sustainable economic management.*

1. Introduction

Kachin State, (343799.999 sq. miles) is made up of beautiful snow capped mountains, tropical and subtropical evergreen forest, and borders with India's Arunachal Pradesh State on its west, China's Yunnan Province on its east, and Tibet in the far north. Total population in Kachin State was 1,689,441, male 878,384 and 811,057 female (2014 census, Census Report Volume 3– A (Kachin). Urban population was **1,642,841** and rural population was 1,050,473 in Kachin State (census 2014). The headwaters of the Irrawaddy River and ice capped are unique landscape of Asian countries, are found in Kachin State. The N'Mai Hka and Mali Hka give birth to the Ayeyawady River. A wide range of ecosystems, through to high alpine areas a diversity of wildlife and numerous extraordinary species of plants, some of great medicinal value (Seng Aung, 2006). Appropriate levels of

properly regulated mining and hydroelectric development could provide an important lift to the economy, though hydroelectric investment often involves the importation of workers rather than jobs for the local labor force. Amber, gold, precious stones, jade and other minerals are extracting. The mining sector is a major source of economic activity in Kachin State. The mining operations have been criticized for the extensive environmental damage they cause, as well as for the working and social conditions of mine workers and the affected neighboring communities. Many social problems such as alcoholism, drug addiction and gambling result among migrant workers separated from their families.

2. Method

The data obtain is based on a variety of sources, including interviews, field works, internet search, social medias and literature reviewed of mining-related documents. The interviews were carried out with knowledgeable people from Kachin State over a time. Interviewees were local miners, mining developers, local leaders and people working in mine areas. Research in Kachin State was conducted all time. There are many questions and answers concern with environmental observing and health studies, and from people who are willing to participate.

Field observation and interviewed aged old people and literature review are carried out. Documentary photographs are taken to be used qualitatively and descriptive research technique is used. Collective discussions at the community dialogues in the villages along with the face to face meetings with different stakeholders at the township level gold mines that included key persons from relevant goal mining and workers that provided information on how working in different gold mining areas.

3. Results

Gold mining

According to MIMU, 2020, organizations active in Kachin State were a total of 64 agencies reported activities in Kachin state: 42 are engaged in development-focused projects (273 village tracts/towns), 11 are engaged in support to other vulnerable groups. Some projects of each sector in Kachin were as follow -

s. No	Sector	No of project	No of Township
1	Agriculture	4	9
2	Environment	3	3
3	Mine action	2	2

Source: MIMU 2020, page 3.

Gold mining operate along all the major rivers, Mali Hka, Nmai Hka, Chindwin and also on-land where virgin forest areas. The main mining centers appear to be along the Irrawaddy River north of the state capital Myitkyina and the areas Hukawng Valley/ Tanai Township and the Chindwin River, Dabi Hka and Nambyu Hka rivers.

Since the 1990s, transformed to Market Oriented Economy local small scale the artisanal mining has been replaced by companies' mechanized mining and more environmental destructive practices. These include riverbed mining with bucket and suction dredges as well as hydraulic mining of river banks and large open pits and shaft mines. Make way for mining and setting of necessary infrastructure on land more and more areas are major drivers of deforestation in Kachin State. Together with the mining activities, mercury utilization in the mining areas has increased. Unsustainable methods of mining that effect increasingly in large areas of land and are spreading, cyanide leaching, as the most easily accessible alluvial gold is depleted and deposits deeper in the ground and in hard rock are exploited.

Kachin State is well-known as rich areas of biological diversity. The natural resources conservation is local, regional and international level of importance.

The logging and gold mining has already caused incalculable loss of biodiversity in the rivers and forest ecosystems. Gold mining is taking place in the headwaters of the Irrawaddy. It threatens the ecosystem of the entire river basin and along with it the livelihoods of about 20 million local people (recited by PKDS, 2004). By its very nature gold mining is unsustainable and highly disruptive to the areas in which it takes place and of the downstream environment. Practically effective conservation and adequate environmental protection laws and proper law enforcement are needed.

Mining wastes is discharged directly into rivers and onto land including agricultural areas, the same time mercury used in the mining process are effected on spreading areas by mining operation moves on. Engine oil used to run machines and waste from mining flow to rivers and valley cause the pollution effect in agricultural lands. Mining chemicals will continue to take its toll on biodiversity and human health. Aside from the obvious pollution, mining causes physical and chemical structural changes to rivers which can cause ecological damage. Rivers are diverted for riverbed mining operations, while water blasting of sediments destroys riverbanks. These structural changes result in the loss of many riverine habitats for fish species. They also affect the direction and speed of the water erosion which has already led to unusually low water levels in flooded areas and increased flooding in others.

Planning for the short and long-term considerations in the Kachin State is desperately needed. The mining of gold in Kachin State is earning enormous profits - but at tremendous lost to the environment. Local communities do not benefit from the business but instead

suffer from environmental degradation. They are frequently deprived of clean water and farm land, and of access to resources that formerly provided their livelihoods. The economic conditions that gold mining cause great inequality and poverty. The uneven development of ethnic areas and widespread corruption has exacerbated the situation.

The mining often deepens poverty and it creates numerous social problems, such as drug and alcohol abuse, prostitution, gambling, loss of community identity and ethnic conflicts. Mining areas are also breeding grounds for malaria and sexually transmitted diseases (PKDS 2004). The gold mining industry as it is operated in Kachin State exposes local people and migrant workers to serious long-term risks from mercury poisoning. According to PKDS 2004, miners and local people are often poorly educated to access information on the threats posed to their lives and health from pollution by mining agents, so dangerous handling of mining chemicals is commonplace. Working conditions for miners are not at all safe extremely difficult to improve. Poorly equipped divers work exceptionally long hours under water directing the hoses of suction dredges. The loose sides of current and abandoned mining pits constantly threatens to bury mine workers and locals under landslides and have already allegedly caused many deaths. Accidents on the turbulent rivers have become more frequent as the number of vessels has increased. The anchor cables of dredges and the dredges themselves are obstacles for traffic on the river. Mining activities in Kachin State have already taken an unacceptably high toll in lives of locals, workers and people traveling along the rivers.

Hukawng Valley: Hukawng, isolated valley in Kachin State. The abundant watershed rainforests of the upper Chindwin (Tanai Hka River) and gold mining activities gold containing sediments deposited by annual floodwaters can be found on the banks of all the tributaries of the Tanai Hka. There are Nam Byu, Shumbwi Yang, Kap Dup, Wanpala, Dalu, Daga, Ting Kok and Nam Gawn major gold mining areas. The natural deep forests are turned into denuded, muddy wastelands of tailings pools and rock piles. The miners are mostly migrant workers from other pleases of Myanmar.

The Mali Hka River is one of the main centers of mining activities in Kachin State. At some places the river is wide enough to allow river bank mining. Before the gold boom, the villagers along the Mali Hka made their living through rotational farming, forest cane (rattan) gathering, and some small scale gold panning. Now most locals work in mining related activities and thousands of outsiders have come as migrant workers. The numerous social and environmental problems these villages face are repeated in many other areas of Kachin State where mining for gems, gold, amber and illegal logging cause a temporary boom. As sustainable local livelihoods have changed to dependency on gold mining, communities have become less self sufficient, particularly in food. In this way, mining has caused communities to become less viable in the long term. Dependence on prostitution and drug dealing, drug abuse and the spread of HIV/AIDS and other diseases are part of the

reality.

Deforestation is a major concern since the trees of the surrounding forests are being cut to clear land, for the construction of mining camps, fuel wood or simply to make space for mining. Sewage from the mining sites contaminates the rivers. Many people do not understand that the river is polluted, and continue to take their drinking water from the river (PKDS, 2004).

Gold mines on the N'Mai Hka River, around Chipwi Township are still being major mined. Magyeng Yang is a mining-affected village in the Chipwi region. The Chipwi region is severely deforested from gold mines abandoned over ten years ago.

Hpakant jade mine

The product of Kachin State is best known for its jade and most of the jade extracted in Myanmar comes from Hpakant. The important jade mines are located in Hpakant township of Mohnyin District (Tawhmaw, Longkin and HOUNGPA). Annual production figures have exceeded 32,000 tons in recent years with a total value of some US\$2 billion, most of it being exported to China (UNDP, 2015). Other important mineral products are amber, gold, copper, iron ore and gems.

Hpakant, is internationally famous jade mines which also produce gold as a secondary product. In the 1980s, the area surrounding Hpakant was destroyed rapidly after the period 1988 with the increase of mining. Hpakant has experienced massive expansion of roads, business activities, and migration. More than 500,000 people were living in Hpakant by 2001(PKDS, 2004). Most are migrants from the whole Myanmar and from China.

Gold and the environment

Mass containing acids, finely crushed rock material, toxic heavy metals, and chemicals like cyanide can be observed. It is difficult to store this harmful waste. Tailings of waste rock and sand mixed with leftover mercury are straight into the rivers and valleys. In addition to pollution from the dumping of tailings and chemical can cause acid mine drainage due to gold is mined from rock ore that often contains high levels of sulphur as contact with air and water and produces sulphuric acid. This acid then dissolves heavy metals like cadmium bound up inside the rock, which then pollutes the environment. There is no scientific research about pollution caused by acid mine drainage in Kachin State to any effort to clean up waste rock or restore water quality and clean environment. Many of the most massive deposits are depleted and the areas from whence the minerals extracted are poisoned wastelands (PKDS, 2004).

There is no land rehabilitation in evidence of gold mining areas that the rehabilitation of mined out areas is not taking place as required by environmental law. Companies often leave old dredges behind in order to save environment and massive disturbance of the natural

landscape.

Gold and social impacts

In Kachin State mining is taking place suffer from a wide range of social problems at the jade mines of Hpakant and other mining areas and spreading throughout the state. The problems such as mercury poisoning or drug, lose identity, the village loses, loss of interested in agricultural practices. The gold mining economy often profits people for outsider rather than locals. Many people lose their land due to gold mining, when the companies to whom they have given concessions force villagers to give up their land.

Education is often neglected as many children are tempted to earn quick money in the gold mining areas. Rising commodity prices, increasing the migration and labour in mining areas. Local indigenous people who work in the mining related business may lack any knowledge of the disease or its prevention at special risk for health. There is an absence of decent medical care and health education. Varieties of narcotics drug abuse spread of HIV/AIDS and other infectious diseases. Hpakant also is one of the human Trafficking industry area in the Kachin State.

Biodiversity

Of about 600 species of rhododendron world wide, around 260 are to be found in Kachin State (PKDS 2004). Numerous plant species were described by Kingdon-Ward, one of the first western scientists to explore Kachin State (1921-1952), among them the black orchid (*Paphiopedilum wardii*) a species endemic to the area north of Putao. A World Conservation Society (WCS) sponsored expedition found 38 different orchid species during a short survey to the Naung Mun area, Putao district in 1998. The valleys contain some of the last remaining extensive tracts of primary evergreen lowland forests in the region. Centuries old teak trees that have been spared the chainsaws and axes due to geographical and political inaccessibility can still be found in some areas. 84.2% of Kachin State's total land area is covered with forest. Ecozones of Indo-Himalaya and Chino- Himalaya, is creating an environment of extremely high biodiversity. As part of the Mizoram-Manipur Kachin rainforest eco-region, the area is home to 149 mammal species, among them the threatened takin (*Budorcas taxicolor*), eld's deer (*Cervus eldii*), red panda (*Ailurus fulgens*), leopard (*Panthera pardus*), gaur (*Bos gaurus*), elephant (*Elephas maximus*) and Malayan sun bear (*Helarctos malayanus*). There are 580 birds species have been counted – which is more than for any other eco-region in Southeast Asia (MIMU, 2020).

The highest number of amphibian and reptile species, the Irrawaddy dolphin, Hukawng Valley, the biggest tiger populations in Asia. Pidaung Wildlife Sanctuary (1917/18), the Hkakabo Razi National Park (1996) and the Indawgyi Wetland Bird Sanctuary (1999), are an important step towards nature conservation. Unsustainable practices like gold mining and related logging and hunting continue in many protected areas

are major problem.

Agriculture

Agriculture can certainly provide a living for farmers and people but at a relatively low level unless technology, farmer support, infrastructure and marketing improve. Tourism might provide some additional potential.

The main crop in Kachin state is rice/ paddy and about 660,000 acres in 2010/11, up from 431,000 acres in 2005 (Proximity Designs, Myanmar, 2016). Other crops with about a tenth as much area each are peanuts, fruits, vegetables and rubber. There are many other crops with much smaller areas planted. Some of these are grown on land not used for rice and some on rice land when monsoon rice crops are not being grown. There might altogether and generously be 900 thousand acres that are cultivated by smallholders.

A farm extension evaluation in Kachin state in 2003 found that paddy yields could be doubled from 40 to 80 baskets an acre at low cost, so net income could be 40 baskets an acre.

There are also gather fish or forest products and to work for wages when farm labor demands are less pressing. Increased jade mining have created more wage opportunities. Income is doubled from other crops, it was well below the income from nonfarm wages.

If farm sizes remain below five acres for most households, the income from farm operations alone is not enough and incomes from nonfarm activity.

Most people (65%) in Kachin state live in rural areas and most of these rely directly or indirectly on agriculture.

The deforestation is bound to cause environmental problems which are hampering smallholder agricultural progress. The presence of well-paid work in jade mines, gold mines and other nonfarm jobs makes agriculture and likely productivity levels less attractive, but it is essential. There are opportunities to improve farming methods, outputs and incomes at a reasonable cost and these needs to be implemented.

The economy of Kachin State is predominantly agricultural. Kachin's agriculture is much less intensively developed than in the Regions of the Ayeyarwady basin to its South. Nevertheless, Kachin produces considerable quantities of rice, corn, groundnuts, pulses and beans, sugarcane and vegetables. A number of eradication programmes has helped to replace opium-poppy as an important crop. There are also good conditions for freshwater fisheries and livestock, common in many areas. The forests produce teak and hardwood, as well as charcoal, bamboo and resin. A number of industries are associated with these products, such as sugar mills and rice mills. Weaving and blacksmithing are important cottage industries.

The river ecosystem

In the river ecosystems habitats having plenty of fertile and diverse, providing homes for birds, mammals, reptiles and amphibians as well as many types of fish, shellfish and other aquatic creatures. Gold mining associated pollution from mercury and cyanide, acid mine drainage, toxic tailings, diesel and engine oil is a severe threat to wild flora and fauna. The potential for mercury to have toxic effects on Irrawaddy dolphins may be high, metals probably settle in higher concentrations in the river channel. Analysis of mercury content in fish samples, areas with the highest mercury pollution were the confluence of the Mali Hka and the N'Mai Hka and the Irrawaddy downstream of the Chindwin confluence (recited by PKDS, 2004). These findings suggest that overall mercury levels are probably higher in Irrawaddy tributaries due to intensive gold mining activities and reduced dilution capacity in these smaller rivers. Ecological impacts, such as bioaccumulation of pollutants, directly in the mining areas as well as further downstream towards the delta area.

More research needs to be carried out. Gold mining brings about a complete structural environmental, social and economic change and affected rivers ecosystems. The pits and shafts of gold mining also cause erosion and again silting as the soil runs into streams and rivers. Landscape changes like river beds, shallow water levels, shift in sedimentation areas and increased riverbank erosion cause floods every rainy season. As mining techniques like sluicing and hydraulic mining in the natural river system have reportedly increased the danger of flooding and droughts. With around 84% forest cover, deforestation inevitably is a side effect of the gold mining process in Kachin State. Forest has to be cleared to make space for mining sites is bringing further deforestation and destruction local communities facing with rising commodity prices and increases the pressure on natural resources and climate change affects and poverty in areas. This cycle of gold mining is results in socioeconomic and environmental often depletion in Kachin State. The rubbish, spilt fuel and sewage from mining camps further pollutes the environment severely threatens Kachin State's river ecosystems and associated watersheds.

4. Discussion and Conclusion

4.1. Discussion

The result of this paper is an important study to gather information about how the lives of people living and working in Kachin State. The findings will provide key information for stakeholders in the government to plan for future local economic activities and environmental conservation and sustainable development in the state, and to address challenges and gaps. The importance of the study lies in the fact that the views expressed are from both sides of the positive and negative impacts.

The study expressed problems and recommendations focusing on the economic activities and environment. The findings share government officials at the State level to further understanding of their perceptions and experiences regarding the functioning of

administration at the gold mining areas in township level and support to lower level mine workers.

The study is appreciation for increased environmental allocations particularly for education and health to the local level, and the resultant improvements. More decisions making in how methods are allocated and plan could make bottom up planning and local people centered development.

To prevent serious erosion and biodiversity lost need to be considered in virgin forest areas and in areas along riverbanks. Because of their remarkable qualities and large number unique species, the forests of Kachin State deserve world heritage protection status – including the N’Mai Hka old growth fir forests and the forests of the Hukawng Valley. Dredging operations should be strictly monitored. Dredging operators should be compelled to restore streambeds to their natural topography, not create waterway hazards. Anchor cables and dredges should not be placed where they endanger boats or rafts. Immediately stop the discharge of untreated mining wastes into rivers. Remedial and mitigation treatment should also be carried out. This should be strictly enforced by law, and with mining companies obliged to put up funds in advance to cover the full costs of clean-up in the event of toxic waste spills in mining areas.

Cyanide use should be either prohibited or strictly regulated, due to the impossibility of safe containment. The sale of mercury should be strictly regulated, and all sales should carry safe handlings and health advisory warnings in relevant local languages. Conduct research on specific effects of mercury pollution in Kachin State is important. This is urgently needed both in Kachin State and in downstream areas, concentrating on the human impacts already experienced in Kachin State. Testing should for contamination of shellfish, fish and weed species may also be necessary.

The large scale increase of illegal migration into mining areas should be managed.

The widespread hunting, electric fishing and consumption of wildlife by people especially by migrant gold miners and timber workers need to be ended.

Employ locals, transfer technology: Foreign-owned dredges allowed to remain in operation should be obliged to employ and train local people to ensure that local people have a fairer share of the economic benefits. Training should include minimizing environmental and social impacts. An environmental law on mining in particular is urgently needed in order to introduce effective legal measures to prevent and mitigate further environmental damage and social fallout and should effectively notified of the environmental protection laws.

Make environmental and social impact assessments by the implementation of laws that cover all potential significant impacts should be carried out.

4.2. Recommendations

To provide improved healthcare services for miners and the general population suffering from pollution effects require affordable, skilled medical treatment and specific medicines. A greater proportion of state revenues should be allocated to enough healthcares, including primary health education.

To provide information on health impacts of mining activities.

To inform local people about the impacts of mining and risk mitigation through the school and medical systems.

Warning signs and advisories in local languages need be put up in appropriate places in mining areas. Medical staff and community health workers need be trained.

Dialogue between all stakeholders, the ethnic nationalities will make possible the effective long-term protection of the environment and more sustainable use of natural resources in the country.

Develop and express clear conservation help research the environmental problems. More information needs to be collected on people need to know the reasons the damage is taking place. It is very important to know what local people think can be done to solve the problems.

Become more active on conservation issues and join all people and who have been taking steps to protect themselves from gold mining destruction.

Aim to increase environmental awareness amongst community, environmental education materials should be produced and distributed to locals suffering from impacts of mining and deforestation, climate change as well as to the decision makers on all levels. People in both the local and international level need to share information about to decreases in fish and wildlife numbers, the increase of water pollution, the spread of deforested and disturbed areas, the extent of fertility and topsoil loss, and resources.

Come up with development alternatives ways of right livelihood (e.g. agroforestry, herbal medicine research and production, food processing, cultivation of cash fruits and rattan cane, hardwood trees, orchids, etc.) are important.

Restore mining areas affected by their activities to their original condition for covering mined areas with layers of soil and topsoil, reforestation and permanent containment of heavy metal and acid contaminated water is needed.

Educate mine overseers and workers on safety: Training on basic and improved methods of handling toxic substances and the use of safety equipment should be compulsory for mining operations.

Research cooperation, development and transfer of new safety equipment and

technical solutions to mitigate social and environmental impacts is needed from international environmental groups for those actively working to protect environment, sustainable livelihoods.

4.3. Conclusion

In summary, several examples of good work and good approaches that need to be acknowledgement. The township development planning process requires clear guidelines in the needs of participatory planning and a clear statement of selection criteria need to be linked to the annual planning cycle. The contact detail of the individual responsible for the project is also important to have institutional economic activities and environmental arrangements in gold mining areas of Kachin State. Research for local populations related to economic functions, environment, management, infrastructure, logistics, and private sector would be replaced on unsustainable gold mining economy and impacts on environment in Kachin State. Deeply studies on protection, livelihood, agricultural, seasonal flood and climate change, appropriate economic activities for urban population need to be explored in Kachin State.

All local people face similar kinds of challenges in their local economy and improving access to basic functions. Poor infrastructure, problems of resource allocation, awareness and public private participation to reforms for advancing development are needed in Kachin State. At the same time, an important start will make on developing the necessary management systems to support participatory development, as well as the creation of improvements in health, education, sustainable management on economic functions. The voices that need to be heard for development goal to solve problems and challenges that will the new directions and effective ways in the State.

Strengthening local economic activities and environmental awareness through the committees and administration to provide services and reduce poverty and improve socioeconomic functions for local people. The reestablishment for sustainable economic and environmental management in village level committees would go to the way to opportunities for people's participation in development.

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