

SOCIO-ECOLOGICAL IMPACT OF COAL MINING: A STUDY IN MOLUNGKIMONG VILLAGE, NAGALAND

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Abstract: Traditionally, tribal people share a symbiotic relationship with nature, i.e., land, water, forest, etc. They maintain a harmonious relationship with nature with a conscious effort of needs-based exploitation of natural resources in a sustainable manner. However, due to the cultural contact with the non-tribal population and increased exposure to the market economy, tribal people's perception of their natural habitat has changed. The influx of 'modern' occupations and technologies among the indigenous tribal communities leads to the commercial exploitation of their natural resources. Tribal people have become more flexible in adapting to modern occupations, thus moving away from indigenous knowledge systems. However, it has both positive and negative implications among the indigenous communities. Coal mining is one economic activity in states like Nagaland, introduced in the era of modernisation and globalisation. As a result of emerging livelihood opportunities in the coal mining activity, it has been found that an increasing number of tribal people are entering into the coal mining activity.

This paper is based on an empirical study conducted in Molungkimong village under Mokokchung district, Nagaland. The study used essential tools and techniques of data collection through personal interviews, observation and focus group discussions. This paper explains the socio-economic impact of coal mining in terms of employment, land disputes, the role of women, health and ecological consequences in terms of decline in the fertility of agricultural land, water contamination, and loss of aquatic creatures in the local habitat.

Introduction

The North East Region comprises eight states: Assam, Arunachal Pradesh, Meghalaya, Manipur, Mizoram, Nagaland, Sikkim, and Tripura, with a landmass of 262180 km, which

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shall consist of 8 per cent of the country's total area. The total population of the North-East region is about 40 million (DE & Singh 2017). The area is filled with rich biodiversity and natural resources preserved and protected by its inhabitants belonging to various indigenous tribal communities. The Land is considered one of the essential natural resources for the tribal people. 'Land is their most important natural and valuable asset and imperishable endowment from which the tribal derive their sustenance, social status, economic and social equality, permanent place of abode, work, and living.

Consequently, tribes have great emotional attachments to their lands,' said a bench headed by Justice Aftab Alam ("as Press Trust of India noted in a *Business Standard* article on April 19, 2013"). One of the unique features of tribal people includes the importance of land and how it plays a vital role in their life regarding economic, geographical, social, and political factors. The tribal communities share a symbiotic relationship and connection with the land or the environment they inhabit. Since time immemorial tribal communities have been deeply connected with the surrounding nature and environment for their survival with activities like agriculture, hunting and gathering and nursery plantations.

Tribal people are indebted to their land as it provides sustenance in the form of natural resources. Practically, all civic activities are also interrelated and intermingled with natural resources. 'Natural resources provide the base on which the entire development network relies, from rudimentary well-being to economic growth; every stratum reflects directly or indirectly on natural resources' (Das 2015: 1). Shimray (2018) further elaborates on the ecological relationship shared between society and nature in a tribal community and how it is intertwined with economic development. The tribal communities have undergone numerous changes in literacy rate, employment patterns, attitudes and occupations over the years. (Shah & Lobo, 2017: 93-107). The flexibility in adapting to new occupations can be observed among the tribal communities from an agricultural-based to non-agricultural-based system among the Schedule Tribes (ST) in the North East region of India (Marchang 2019). Subsequently, the introduction of coal mining as part of the developmental policy in India among the tribal communities has led to numerous social and ecological issues such as displacement, exploitation, resettlement, change in livelihood, and ecological issues (Narasimham & Subbarao, 2018).

Within the northeast region, Nagaland is one of the states possessing rich natural resources. It has moderate coal reserves of approximately 446.42 million tonnes ("As noted in a *Morung Express* article on April 4, 2022"), and mining occurs across the district of Mokokchung, Wokha, Dimapur, Longleng, Mon and Peren. State government, local contractors, insurgent groups and influential civil society actors play a vital role in managing and regulating coal extraction in Nagaland, giving birth to various conflicts and contestation over the resources (Ra, Duncan & Kikon, 2016). The tiru mines in the Mon district of

Nagaland faced multiple issues relating to the loss of rich biodiversity and life-supporting ecosystem services, polluted water, barren land, decrease in the yield of agricultural production, and emerging health issues (Toastbread 2018). Ambrocia (2021), on the other hand, discloses the reality of illegal mining found in Nagaland due to the absence of a mechanism to regulate coal mines; out of 49 mines, 44 coal mining units in Nagaland operated without permission from the Nagaland Pollution Control Board (NPCB). The coal mining scenario in Nagaland needs serious attention as the issue around there is unique in each district or village.

Coal mining as a method of extracting natural resources has various impacts on society, as stated in the above literature; the present study seeks to uncover the realities of how an industrial product such as coal mining influences the lives of the tribal community. Despite the rich overview of the subject matter, minimal research has been carried out in Nagaland in the context of coal mining, especially in the studied area, i.e., molungkimong village and more from a sociological perspective. Thus, the present study seeks to engage and fill the research gaps within the given context in the studied area.

Objectives of the study

The present study has been carried out to understand and explore the socio-economic impact of coal mining in *Molungkimong* village, a tribal community. The study focuses on the emerging ecological issues caused by coal mining in the area above and its impact.

Research Methods

The study was carried out in molungkimong village within the mokokchung district under Nagaland. This village selection is based on the following parameters, i.e., the practice of coal mining in the area, the quantum and the duration of mining. The respondents for this study are selected from Molungkimong village through a simple random sampling technique. The village has ten *kebels* (colonies), out of which five individuals were chosen from each *kebel* to represent the total population in the village. Further, the respondents are chosen from various socio-economic backgrounds including land owners, coal contractors, members of the Village Council and Village Development Board, farmers, and coal mine workers, both men and women. In this study, personal interviews and focus group discussions were employed to collect the data from the respondents. Narrative analysis has been used as a tool for data analysis.

Brief Profile of the Study Area

Molungkimong village is situated near the Tuli area under the Mokokchung district in Nagaland and is inhabited by the *Ao* Naga tribe, with a total of 534 families. It has a

population of 2816, of which 1371 are males while 1445 are females (Census of India 2011). The village has had its distinct cultural and traditional practices since time immemorial. It comprises well-established local self-governing institutions, educational institutions, religion, family system, and agriculture serve as the dominant occupation of the people.

Coal mining activity in molungkimong village has begun in the year 2007. Since the inception of coal mining, the community has undergone several social, economic, political and ecological changes. The present research highlights the impact of the new occupation in the traditional tribal community of molungkimong village.

Results

Impact of mining on economic development: The study entails the fundamental transformation in the occupational structure from an agricultural-oriented economy to manufacturing. Similar cases have been evident in United States societies, where the introduction of new industries has led to the alteration of occupational structure (Singelmann et al. 1980, 246-247). The village shows a similar shift in the occupational structure from agricultural occupation to commercial coal mining practices. Only a trickle of folks could perform the mining activity as contractors due to their economic status. Most people in the village could not participate in this emerging economic opportunity due to the lack of resources or means of production to invest in the capital required for coal mining activity. However, the villagers were constantly involved as wage labourers in the coal mines.

Employment opportunities: The workers in the coal mine are primarily from Assam and Mon areas, with few people from the Molungkimong village. Only a handful of men are assigned as *Mabori* or head in charge, while the rest as workers. The main reason behind the limited inclusion of the local people in the mining activity is the lack of skilled and experienced workers for rat hole mining, the most common technique used in coal extraction in the region. However, despite that, the *Mabori* is usually selected from the village, and they are closely related to the contractors. For workers, weekly, the work shift is scheduled for 9 hours, and the mineworkers are paid according to their work allocation. The *mabori*, or the head in charge, receives the highest pay in terms of monthly salary and the rest of the workers, such as the excavators, haulers, cooks, etc., are paid differently on a daily wage basis once a week. According to the mine workers, the working conditions have been comfortable except when the native contractors delay the payment process when the coal product in the market remains deterred.

There are no specific criteria for selecting the workers, except for the rat hole mining system, which requires experienced skilled labourers often recruited from other areas like Assam and Konyaks from Nagaland, who share a long history of coal mining practices.

Coal mining activity unlocked new avenues of livelihood for the villagers to improve their income, which was relatively minimal in agriculture work. In the coal mines, the workers are stratified and assigned particular roles based on the nature of the work. The workers include the *mabori* (head in charge), who is paid a salary of Rs. 10,000 per month. The machine operators and the assistant are paid about 20,000 and 3000 rupees per month, the cook is paid 5000 rupees per month, and the head mastery and workers are paid daily in terms of coal extracted in tonne, each tonne equals 400 rupees, and each full truckload is 5000 rupees. The workers are further divided into extractors and hauliers. The extractors are paid according to the amount of coal extracted in a day, as mentioned above, whilst the hauliers are paid 500 rupees daily. Comparatively, the wages are paid daily, not exceeding 400 rupees each day in agricultural work. One respondent, 40-year-old wage labourer, has stated that “*The income from the wage labour in the agricultural field is much lower than working in the coal mine*” (Source: Interview from the field, ‘17 July 2017’).

Despite the thriving economic opportunity, the benefit of coal mining in the village economy has been partial and sectional to only a fraction of the people engaged in the coal mining activity, such as the native contractors and wealthy landowners. The section of people owned the essential means of production to execute the process, and the mine employees such as the *mabori*, labourers, etc. In contrast, the remaining rural inhabitants engaged in agricultural occupation remain unaffected economically by the new work whilst facing the everyday environmental degradation caused by coal mining.

Impact on Women: Mining and women in terms of the occupational structure have never been conceived positively. Mining has been considered a masculine domain due to the dangerous, risky and hazardous job and the myth that revolves around the male world (Dutt 2007, 3). The study shows gender segregation towards women in coal mining activity. The number of women labourers was scarce due to the workload that imposed substantial physical activity, and only married women were involved. The women workers in the mines are mainly from the native village only. Some of the underlying reasons for the participation of women folk in the mining activity include a) The high income as compared to agricultural labourer and b) Husbands being part of the same occupation. Women workers were allotted as hauliers to transfer the extracted dirt or coal seam from the mine site. Women labourers were restricted from digging or extracting coal inside the mine as it was considered risky and were engaged mainly by male workers. The participation of women in the workforce is irregular due to their household chores. The women coal workers are primarily employed as hauliers and are paid five hundred each daily; the wage is equivalent to the male hauliers. Their involvement in the new occupation was based on their convenience without any restriction from the male folks.

Issue of Alcoholism in the Village: “Alcoholism is a complex, many-sided phenomenon, and its many formal definitions vary according to the point of view of the definer. A simplistic definition calls alcoholism a disease caused by chronic, compulsive drinking” (Vaillant 2019). Coal mining has contributed to multiple changes in the structure and functions of the community. In Nagaland state sale of liquor is banned under The Nagaland Liquor Total Prohibition Act, 1989 (NLTP Act). Accordingly, the village council has implemented a ban on the import of alcohol in the village on legal, moral, and religious grounds. However, despite the council’s veto, there have been reported cases of illegal transport from the Tuli area. This nearby town lies near the border area of Assam, facilitating the easy entry of liquor into the area. The study shows the exponential growth of the alcoholism rate in the village. Such cases are evident in the Village Council Secretary’s record from the year 2003- 2017, which depicts an increase in the usage of alcohol in the village from the year 2007 onwards, the alcohol-related issues escalated, and many accusers were penalised by the Village Council for creating malice in the village. The villagers stated that it was directly connected to the new occupation, as it promoted windows of opportunities for the unemployed youths or men to engage in economic activity, improving the source of income.

Before the onset of coal mining, the villagers were self-sufficient in the economy, with a significant source of income coming from agriculture, whereas some were in government employment. However, after engaging in the mining occupation with an improved income, people started spending money on consuming alcohol. A mine worker, 30 years old, working in the mines, stated: “*It is because I earn more money nowadays that I have become greedier and more gluttonous than before*” (Source: interview from the field, 17 July 2018).

Alcoholic abuse generates tension and moral disintegration in the village, which is unacceptable; such acts were contempt and punishable in the village’s laws as it was a Christian dominion community. Moreover, it has led to the amendment of new rules by the ‘*senso mungdang*’¹ and village council to increase the penalty for the individuals involved in such activity. The village council also responded by taking action against the vendors engaged in the alcohol business by penalising them with heavy fines and even ostracising them from the village temporarily or permanently, depending on the cases.

Development of Infrastructure in the Village: The opinions shared by some respondents in the village were quite optimistic regarding the roads connecting the village with the mining area that the contractors were recently constructing to transport heavy vehicles and machinery for mining purposes. The coal mining activity benefitted the contractors and villagers; however, such benefits were confined only to those members who leased their land to the contractors for mining. A 40-year-old female farmer told: “*Now we have roads to go to our field, especially during the harvest season. We can take vehicles to carry*

the harvest back to the village, unlike the olden days in which we have to carry it by ourselves” (Source: interview from the field, ‘19 September 2018’).

However, on the other hand, all the respondents mentioned that due to the regular movement of heavy trucks and machinery, the main road leading to the village is often ruined, hampering vehicle mobility during the rainy seasons.

Health Issues: Mining also leads to several health complications among those engaged in this work. Coal mining in England, especially in Rhondda valley, resulted in several health issues due to the pollutants produced in the coal mining process. In particular, the recognisable patterns of male infertility are discussed (British Medical Journal, 1979). Further, it results in respiratory diseases, such as Pneumoconiosis, silicosis, mixed dust pneumoconiosis, dust-related diffuse fibrosis and chronic obstructive pulmonary disease (Laney & Weissman 2015). Coal mining introduces various water, air, and soil pollutions that severely affect human health. In Molungkimong village, the miners or the labours, apart from the stench produced by the unearthing of the coal seam, no such fatal diseases causing death had been noted, apart from the non-fatal ailment. Therefore, the study opines that the health issues remain latent due to its recent introduction and small-scale production process. The concept of coal mining in the village remains in its initial phase, unlike the more sophisticated system practised in other states or countries. Geographical factors also add to its advantages as the mining sites are far from the village settlement. Hence, such health hazards are not observed among the people in the study village.

Land Disputes: Coal mining requires significant human and economic capital; consequently, only a few people from the wealthy class are engaged in the mining activity as contractors. The local contractors in the initial phase had a limited area to begin the mining activity. Thus, the native contractors started to purchase land on a lease basis from the village members. The mismanagement or dumping of coal waste beyond the vicinity of the leased land by the contractors and mine workers has caused numerous land-related conflicts between the land owners, contractors and the neighbouring farmland owners.

The recent records of the village council reveal an exponential rise in land disputes within the village from 2007 onwards due to coal mining activity. After the induction of coal mining, some village members participated by leasing out land to the stakeholders for 1-2 years, leaving absolute authority over the land for coal mining purposes. Since the individual land or territories are not adequately defined in the village, marking the boundaries was done in a traditional method without any legal documentation to support them. The land disputes were prominent for two reasons: the vague notion of individual land boundaries. Secondly, the toxic coal wastes and other impurities were disposed of in the neighbouring land during the coal extraction process. A 60-year-old farmer and victim of the land dispute stated: *“All my fields have been destroyed because of wastage from coal mining, and*

now nothing grows in my field' (Source: field interview, '21 November 2018'). Such activities were prominent, and the local contractors showed no remorse. When cases were filed to the village council by the victims, the local contractors were exempted from fines because of their political and economic influence over the village.

In most cases, the disputes remained between the landowner who sold the land and the adjoining neighbours whose land the waste was being dumped. The legal actions implied by the village council included penalties for paying ransom to the victims whose lands were invaded and damaged, but it hardly solved the social tensions. On the other hand, the degraded land remained without any hope for restoration. There were levels of exploitation of the ordinary farmers who owned limited land and were not part of the transaction or the mining activity. The unscientific mining process and the poor management of coal waste bared a heavy toll on the agricultural land by polluting the fertile soil due to its high acidic composition killing all the vegetation in and around the vicinity.

Ecological Impact: The sample village shows the significant role of the environment in their society as a tribal community and is greatly dependent on nature for sustenance. Agriculture serves as the dominant occupation. The indigenous people display the ecological service system through their daily activities, including hunting and gathering resources like firewood, fruits, herbs, and fishing from the environment. Adapting coal mining in the village has led to various ecological effects ranging from degradation and destruction to species loss. Mining of both surface and subsurface causes enormous destruction in the environmental system, including the flora, fauna, Hydrological relations and soil biological system which in return disrupts the ecological service system constraining the human inhabitants in the area (Uppgupta *et al.*, 2017: 150).

Land Degradation: Open-cast mining has been implied in its initial phase and preceded by rat hole mining, leaving the land exposed to erosion, contamination, and degradation. The area that falls under the mining site becomes uninhabitable for all living organisms rendering it unfit for cultivation as the soil fertility is drained by the chemical compositions in the coal waste. The respondents have mentioned that *"nothing grows near the area of the coalfield"* (source: field interview, '28 November 2018'), resulting in a large area of soil exposed in the open, leading to soil erosion. The mining sites in molungkimong village are not adequately maintained. Once the coal seams are extracted, the exposed land is left under the mercy of nature without any mitigating maintenance by the landowners or local contractors. Most respondents have also mentioned that *"if coal mining were to continue, the village would not be a safe place to live"* (source: field interview, '28 November 2018'). Here, the local community primarily depends on agriculture. Yet, the new economic system contradicts the traditional farming system affecting the cultivation process due to unscientific mining and improper coal waste management.

Impact on Agricultural Land: Agriculture has played a vital role since time immemorial in the economic culture of the tribal people making the tribal economy self-sufficient and substantial. The study shows several victims whose agricultural land falls in the vicinity of the coal mining area and has suffered the consequences of mining activity that destroyed crops and vegetation around it due to the lack of proper regulating mechanism. It exterminates the crops and prevents vegetation from regeneration resulting in the desertification of the land, also affecting the area's entire ecosystem.

The local contractors are well aware of the situation but still pursue economic goals, further exploiting the villagers. The agricultural farming system practised in the study village includes shifting cultivation.² The study village portrays the vast area of land utilised for coal mining, which contradicts the practice of shifting cultivation, where the nature of cultivation is done annually followed by the fallow period, and rotation of land is inevitable. Villagers whose fields are affected by the mining activity encounter difficulties in cultivating or harvesting as the waste from the mines obstructs the cultivation process, thus posing a significant threat to the traditional farming system.

Desertification: Desertification is when the land becomes infertile for vegetation to grow, resulting in a barren land where the area is covered with dry sand and becomes identical to a natural desert. Coal seams are deep within the earth's crust; consequently, extracting coal demands heavy machinery. Mountains covering a sizeable geographical landscape holding rich biodiversity, containing flora and fauna, are carved and dug recklessly to access the coal beneath. Multiple mountains are excavated from top to bottom until nothing but contaminated soil and coal waste are found. The coal mines in molungkimong village show similar results, as the land invested for mining has transformed into a desert or barren land, and these desert lands are a mixture of coal waste and eroded soil. The contaminated desert lands of the study village bear no vegetation or wildlife. The issue is not confined to the present context alone but rather is a chronic affair, as rehabilitation of the foliage and regeneration of the soil are delayed causing further impairment to the environment and the society.

Contamination of Water Resources: Small streams and large river bodies play a vital role in sustaining the people living in rural areas. Most indigenous tribal people residing in rural areas have limited access to water lines. The indigenous people are dependent on the natural water sources available in the environment. Every household in the village generally had small streams near their agricultural field for drinking water and irrigation of the crops. Coal waste reacts with water and pollutes the water due to the high concentration of chemicals in them. 'Coal mine drainage adversely affects streams and rivers' aesthetic appearance, making them unfit for domestic or agricultural use (BFAP, 2012: 27). The coal fields closely associated with agricultural land show an adverse effect as the streams that

run in the area are destroyed in coal extraction, contaminating the existing streams. Discolouration of water results from the high chemical or acidic content in the water, making it unfit for drinking and watering the crops in the field. The small streams contaminated by the coal waste further pollute the remaining connecting streams, including the large rivers.

Tzurang is one of the major tributary rivers found in *Molungkimong* village and is a part of a natural commodity providing water to the community for irrigation and livestock rearing. However, the practice of coal mining in the area has critically affected the *Tzurang* river and deteriorated the water quality (Semy & Singh, 2021). The abundant aquatic life started depleting because of excessive dumping of coal waste in the river. Some respondents who are engaged in fishing have reported the scarcity of fish due to the impact of coal mining in the area.

Loss of Aquatic Life Forms: Aquatic life forms are living organism that inhabits and breeds in water. The study village commonly practices fishing culture through community participation or amusement. Fishing is carried out on a large scale in the *Tzurang* river using different methods like fish bombs, electric gadgets, and fishing nets. Subsequently, the community also engages in small-scale fishing in nearby streams and rivers by using traditional methods to catch small fish, crabs, and shrimp. The effects of coal waste in the major tributaries and small streams have adversely affected the community's fishing culture and traditional food habits. Most respondents believe mining negatively impacts fishing and aquatic life due to the limited availability of sources in the present context and the failure to capture fish effectively compared to the pre-mining era. The unregulated coal waste has contaminated the village's nearby streams, annihilating the aquatic ecosystem by limiting food sources such as small fishes, crabs, and shrimps. These local delicacies are part of the native food culture.

Impact on the forest resources and wildlife: Forest is essential for the rural community as it provides them with natural resources such as firewood, herbs, fruits, etc. In the environmental aspect, forest helps in the maintenance of the ecosystem. In the study village, the forest plays a vital role; a vast area of forest land has been conserved in its natural state by the village council and has not been utilised for shifting cultivation or agriculture to maintain the ecosystem. Recent years have shown the practice of log cutting by the indigenous people for commercial reasons, but the village council has held the exercise due to its negative impact. In the present scenario, the practice of coal mining has doubled the destruction of the forest. The coal fields are located deep inside the forest; thus, for the mobile machines to reach the mines, the workers cut down massive forest areas, leading to a larger scale of deforestation and habitat destruction for wildlife. Ostensibly, the floral and faunal habitats are greatly affected by the mining process.

Flora means the plants that are growing at a particular place and time. The study village has many plants growing in the environment, which the people consume as food and herbs. The community members practice salvaging from the forest, such as collecting firewood and gathering mushrooms, herbs, and edible leaves; it is a common practice among the tribal people of Nagaland. The coal extraction process in the study village shows the destruction of the floral habitat as the procedures adopted in the extracting process involve clearing a large number of forests and vegetation leading to habitat destruction of several plants in the vicinity.

On the other hand, Fauna represents all the animals at a given location and time. The effect on the floral population also directly or indirectly impacts the faunal population as the ecosystem is interrelated and interconnected. The study village is rich in its faunal population, with numerous animals in terms of mammals, birds, reptiles, amphibians, and fishes. The study village practices hunting and fishing, as meat and fish are an essential diet of the people. Still, the Village Council regulates excessive poaching and fishing by implementing customary laws to control such practices. According to a 30-year-old part-time hunter, *“the scale of animals found in the past has been no more abundant in the present, hunting was also much easier back then where I bring home at least one of the kills, but nowadays I have to spend more nights to encounter them”* (Source: Field interview, ‘15 June 2018’).

Coal mining has reduced the hunting culture in the village because of the limited availability of animals and birds due to deforestation, noise pollution, water contamination, and habitat destruction. On the other, it has affected the food habits of the people who relied on hunting. The species of animals found in the village has been noted through the witness of the hunters in the village, which includes bear, deer, wild boar, wild cats, wild dogs, a variety of birds, and rotten. The species found in abundance before are rare; the respondent mentioned the difficulty of spotting the animals in the forest today due to the influence of mining activity on the environment and ecosystem.

Coal mining as a Sustainable economy? The economic benefits from coal are quarterly compared to the destruction incurred to nature and the ecosystem. The society and environment are highly neglected, with the priority given to monetary gain (Sarma, 2005: 29). The study reveals that coal mining towards economic sustainability cannot be achieved. The environmental casualties have been inevitable and massive, which cannot be recovered by financial gain. The Respondents, including the local contractors, had similar grievances regarding the destructive nature of mining on the environment. One of the local contractors, a 62-year-old, has stated: *“If we continue to mine extensively, there will come a time when the land will give in, and the village will collapse”* (Source: field interview, ‘17 July 2018’). Being asked the second time about whether it benefits the people, the local contractor responded by saying, *“It does to him, and he wants to continue the process as the earning is quite reasonable”* (Source: field interview, ‘17 July 2018’).

However, all the respondents agreed that coal mining, in the long run, is risky and not sustainable.

Conclusion

To conclude, the introduction of mining activity in the study area has negatively impacted the majority population. The crucial finding is that this negative impact has touched all aspects of the village's everyday life. The only positive outcome of coal mining, an additional employment source, has been limited to very few families in the village. The study findings reveal that coal mining erodes age-old traditional land use patterns, agriculture systems, natural resource management, ecology, and social solidarity, which is the unique feature of the indigenous tribal populations worldwide. Coal mining has led to the conversion of tribal land into a commodity, resulting in unequal resource distribution and increasing economic and social disparities in the village community. The study findings thus question the relevance or the suitability of such a 'development model', which contradicts the socio-cultural ethos of indigenous tribal communities of Nagaland.

Recommendations

Some of the recommendations posited through the findings of the study are:

- (i) Mining should be carried out sustainably without affecting the community's environment and culture.
- (ii) Proper regulation should be set up to check illegal and unscientific mining.
- (iii) Awareness needs to be provided to the community before joining the mining economy.

Notes

1. *Senso Mungdang* is the apex association in Ao Naga society, comprising only male members who discuss and decide the plans for the village by conducting a meeting once every three years.
2. A farming practice where a plot of land is utilised only for one year for harvest before returning to the same portion of land by maintaining a fallow period of 5-10 years

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