



Impact of Mine Closure on Regional Socio-Economics

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Abstract: Mining is a primary activity which is majorly dependent on the non-renewable resources of the earth. Both underground as well as opencast mining activities has a widespread areal impact. Apart from the direct economic impact, mining activities also result in some positive & negative externalities. This impact is evident not only on the economy but also in the society. Mining is such an activity whose impact lingers in the society even after the operation ceases to exist. Therefore, it is significant to study the effect of mine closure on the regional socio-economics. Apart from studying the impact of mine closure, this paper also tries to highlight the need of a scientific mine closure plan and give some suggestions for formulation of the same.

Key Words: non-renewable resource, mine closure, socio-economic impact, environmental impact.

1. INTRODUCTION:

Mining operations are relatively finite economic activities as they are based on extraction of non-renewable resources. The operational life of a mine exists as long as mineral reserves are available. Once reserves are taken out and exhausted, the mine has to face closure. Mining in any area leads to a whole gamut of economic activities surrounding the mine. Most of the mining areas in the world have witnessed a socio-economic setup growing around the mining industry. Sudden closure of mines must have serious impact on the social and economic setup of the surrounding area. It is necessary to discuss the social, economic and environmental impacts and beyond the end of a mine life.

2. SOCIAL AND ECONOMIC IMPACT OF MINE CLOSURE:

Mining in any area contributes positively to an area's development. This positive contribution lasts as long as the mine is operating. Mine closure has an impact on the following areas of the community life:

I. Employment & Labour Migration:

i. Employment:

The problem of employment is one of the most serious and long-lasting consequences of mine closure. Mining communities who are at the brink of facing mine closure not only face the problem of quantity of jobs but quality of jobs as well. Mine closure brings a situation where there is dearth of permanent, stable jobs providing bare minimum wages. In addition to the workers laid off directly from the mines, jobs are lost in the auxiliary and supplementary industries that serve the mines. The various service industries that had mushroomed due to the surrounding settlements also suffer due to mine closure. The long-term unemployment and underemployment that is brought in due to mine closure has led to a worsening of living standards.

ii. Migration:

The ultimate result of poor local employment opportunities due to mine closure leads to migration. Migration is directly linked to local labour market in the following two ways:

- a. It arises as a result of lack of employment, and
- b. It relieves the pressure on the local labour market for those who did not migrate.

Loss of local job opportunities and shredding off of local labour ultimately leads to the movement of the population from the closure affected area to other lands. This leads to regional imbalance of human resource, with the closure affected area lacking workforce and excessive population pressure on the other regions receiving the immigrants. This will ultimately create imbalance in the social setup of the region. Forced displacement of labour force may also lead to social tension. The problem of housing is also a sever constraint.

II. Social Services and Community Life:

Impact of migration due to mine closure throws an impact on the area's social services. Services provided by the mine management for maintenance of houses, schools, hospitals, local transport and communication would lose its support. The impact will be seen in the settlements that are in the environs of the closed mines. Local drainage and sanitation facilities will also deteriorate. When the mines were under operation, education health and other social services were provided at no charge or at nominal charges. After the closure of mines, it would not be possible for the industry to carry on with their social services. Similarly, the health sectors run by the mines will steadily erode due to persistent financial problems. All these will negatively affect the community life.

III. Standard of Living and Social Security:

Loss of employment, no regular wages, poor housing and unhygienic drainage and sanitation conditions will ultimately lead to poor standard of living. With deteriorating financial conditions, capacity to avail proper nutritious diet, proper clothing, medical facilities and standard education facilities will reduce. All these will lead to poor quality of life of the people. Lack of employment opportunities will lead to social unrest. Rise in social evils like forgery, robbery, murder etc will be rampant and will make social life miserable.

IV. General Economy of the Region:

Closure of mines may lead to closure or loss in the allied and subsidiary industries. The local economy that was developed surrounding the mining settlements will also face loss due to drop in purchasing power of the people and constant out migration. Thus, the basic economic activity, i.e., mining getting closed, the chain of activities established around it will also cease. This results in the general economy of the region getting paralyzed. A huge effort would be required to restructure the paralyzed economy.

V. Community Cohesiveness:

In addition to the social consequences of mine closure that are implicit in the problems of employment and social infrastructure, the capacity of the community to absorb the negative shocks of mine closure diminishes. These could include problems of a more psychological or behavioural nature, which is socially undesirable. The cohesiveness of the community breaks and the capacity as well as strength of the community to sustain the negative phenomena and mitigate it weakens. This is a long-term negative impact, which is most destructive for the region. From this perspective, the mining communities seem to be fragile and vulnerable with their capacity to respond adequately on the community level getting diminished.

Two broad types of social consequences are –

- a. The loss of community space including the various forms of infrastructure linking the individual/family to the community and family relations. This problem consists of a physical dimension and an abstract dimension. The physical dimension in this context includes the deterioration of infrastructures like roads, telecommunication etc, which helps people to interact with family and society in general. Closure of mines leading to unemployment makes people feel out of society. Cultural centres and youth clubs owned by the mine getting closed, members of the community lose the opportunity to socialize and to organize activities for children that were frequent in the past. Abstract form of impact lies in the lack of community cohesion and a lack of a shared sense of identity and a worthwhile future. The families struggle to meet needs so they stop socializing with friends and family. The aspect of migration leads to erosion of identity of the community. Those who migrate to other places are basically young and are male. This leads to imbalance in the demographic setup of the region. Labour migration in a family leads to unfortunate consequences like family feuds and greater number of children being raised without their parents.
- b. The loss of social status – before mine closure, workers enjoyed a high status in their communities. This status was reflected in wages that were among the highest for industrial workers. The sudden loss of this status has

led to difficult periods of adaptation for the workers and their families. The condition worsens, as there are no alternate sources of income for them.

VI. Environment:

The environmental impact of mine closure is severe and generally well known, even if the exact manifestation of the impact is highly site specific. Environmental protection is an important component of mine closure plans. It also covers a large portion overall cost of mine closure. Within environmental issues, importance is given to issues like preventing damage resulting from the restoration of underground water level, land reclamation and afforestation. Prevention of damage of the locality due to waste disposal from the mines is also important.

3. OBJECTIVES OF MINE CLOSURE PLAN:

Mine closure policy and planning define a vision and sets out concrete objectives to implement that vision. To achieve this, a mine closure plan should be an integral part of a mine's life cycle and be designed to ensure that (Sassoon, 2000)

- i. Environmental conditions, general public health and safety are not compromised.
- ii. Abandoned sites are to be properly reclaimed keeping in view the environmental and community needs.
- iii. Alternate employment opportunities are to be generated to maintain the economic equilibrium of the region.
- iv. Any adverse socio-economic impacts are to be minimized and to ensure the availability of maximum benefits.

Planning for closure includes integration of closure programme for the entire mine area, identification of the time of the planning process, consideration of issues related to specific economic and community objectives. The process of formulation of closure plan includes –

- i. A study of closure options including all aspects of possible outcomes.
- ii. Consultation with all concerned groups to determine the preferred after use of the mine site and other infrastructure.
- iii. The mining company's commitment towards the outcome of closure of its activities.
- iv. Estimation of closure cost and cost for achieving the objectives.

Mine closure should be an integral part to the whole of mine life plan. Closure plans include a commitment to progressive rehabilitation and detailed plan implementation and development. Operating mines that are close to the end of their economic life have limited options available for creating sustainable economic stability after closure. Mines that are in the middle of their operating life have more opportunities while the mines in their early stage have maximum freedom to formulate its policies to maintain regional socio-economic balance. Ideally, planning for closure should be started during the early stage of mine planning and inception.

The activity during final closure stage includes –

1. Removal of infrastructures
2. Implementation of public safety measures
3. Re-encountering and re-vegetation
4. Ongoing maintenance of site structures and monitoring the environmental issues
5. To mitigate and prevent long term environmental degradation
6. Completion of company's involvement in sustainable community's social and economic programs

4. SUGGESTIONS FOR FORMULATION OF MINE CLOSURE PLAN:

Development can be made long lasting only if the management considers the closure impacts and objectives from the time of inception of the mine. The mine management at the time of mine planning must formulate policy and plan for mine closure. Formulation of appropriate closure policy along with proper implementation of closure of closure plan will lead to potential future for the local community's economic and social life. Formulation of mine closure plan and policy should be undertaken in consultation with the regulating authority and local community.

Following are the suggestions which if formulated during mine inception and effectively applied from the first stage of a mine life will lead to proper mitigation of the post closure problems faced by the mining community:

- i. Estimate the cost of mine closure at the time of mine inception
- ii. The social protection benefits should be broadened from the very beginning so that negative impacts of employment on the population and the allied economy can be mitigated at the right time.
- iii. Post closure activities should be formulated and its cost estimated from the time of mine inception so that after closure the laid-off workers can be rehabilitated in some other sector in accordance with their skill.
- iv. Recognize and formulate the role of the local government for mitigating post closure problems
- v. Capacity to sustain the negative impacts should be built at community level. Communities in which mines are closed are confronted with many problems but they lack capacity and skills to sustain the impacts. Providing financial help is not sufficient in such cases, it is necessary that there is proper management at local level to build the capacity of the community so that the limited amount provide as assistance can be utilized in the best possible way.
- vi. Impact of mine closure is long term so the technical assistance provided to the community should be in respect to long term benefit.
- vii. The government and local bodies should be trained to modify and implement the policies as the situation arises. Effective and economic technical assistance can be provided through seminars and workshops that bring representatives of different sectors of the community for exchange of experiences.
- viii. Along with public sector, private organizations should also be encouraged in rehabilitation programs in the affected areas. This is needed because rehabilitation should be carried on in a broad environment experiencing continuous growth so that it is sufficient to absorb the shed labour force.
- ix. Provide migration and transportation facilities to the interested households. It is difficult to provide direct migration facilities to a large volume of population. But at the same time, it is recognized that labour migration is a desirable phenomenon to maintain balance between demand and supply of labour in the local market.
- x. The closure of mine invariably affects economic activity and community development in the mining area. The sustainability of community activities that are supported directly or indirectly by the mine comes at risk. The mining company may directly sponsor many essential community activities like medical care, school etc. the mine management should along with consultation with the government and community leaders see that these activities continue even after the mine closes.
- xi. A community trust fund should be established which is protected against inflation. The income from the fund will allow the community to take long term sustainable measures. Such cooperatives also will help the people to build their own resources to attain sustainability.
- xii. Effective stakeholder engagement will help to develop innovative approaches to long term land use at abandoned mine sites. Environmental monitoring during the post closure period is very important at all mine sites. Mine management should also see that water management and treatment activities are carried on even after mine closure.

5. CONCLUSION:

Mining towns and other towns dominated by a single industry are often described as “dying towns” after the closure of significant downsizing of the dominant industry in the local economy. From the inception of mine in any area its short shelf life should be kept in mind. With this consideration restructuring policy of the mine should be formulated. Timely formulation and proper implementation of the rehabilitation and resettlement policy will lead to limited adverse impact on the community.

There is an important role to play by the policy makers in helping the local governments to prepare for the difficult adaptation that they have to face after mine closure. Cooperation from all sections including NGOs will lead to proper utilization of the resources and timely implementation of the rehabilitation policy. From the environmental point of view, wastes from mines can be processed to some other useful product, which can have ready market. Such measures will not only prevent environmental degradation but will also lead to a business opportunity for the sick economy of the region.

The closure policy of a mining company must be transparent. Sudden mine closure can be very disruptive to local communities. Advance notices about closure can help the government and local communities prepare better. While early announcements of planned closure provide useful input to planning by local governments and individuals, it does affect

the mining company's abilities to maintain a productive workforce till the end. But for the sake of socio-economic sustainability of the region and standard living conditions of the inhabitants it is necessary to have a detail socio-economic study, which would be of much help to implement the mine closure plan.

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