
Corporate Mining and Sustainability: Assessing the Socioeconomic effects of Mining on Pastoral Community in Hazara District

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Abstract

Mining has severely impacted the livelihoods of pastoral communities by degrading grazing lands, depleting water sources and reducing livestock productivity that directly affects household income and livelihoods. This study explores perception of pastoral community towards the effects of mining on their livelihood in District Hazara with objectives: to investigate the effects of mining on traditional land use patterns of pastoral communities, to investigate the economic effects consequences of mining activities of Hazara district, and analyze the effects of mining on livestock and pasture resources. The universe of study is district Hazara by using qualitative research method used in which text extracted from discussion with ethnographic approach to deeply understand the pastoral community perception. The method for gathering data is an in-depth interview where qualitative research technique (interview guide) involves. Initially 20 respondents are selected from pastoral community in the study area for in-depth interviews that can be expanded based on non-saturation. Convenience sampling is employed to select respondents based on their accessibility and availability while bases on thematic analysis technique data was analyze. Studies show that mining activities lead to extensive deforestation, land degradation, and soil contamination, which significantly reduce the availability and quality of grazing lands. The depletion of natural vegetation forces livestock to rely on nutrient-deficient pastures, leading to malnutrition, reduced fertility, and lower milk and meat yields. Mining operations require large amounts of water, often leading to the depletion of traditional water sources such as wells, springs, and rivers. With livestock suffering from poor nutrition and disease, their market value declines significantly. Research findings suggest that pastoralists are increasingly forced into distress sales, selling animals at unfavorable prices to meet household expenses. As traditional pastoralist livelihoods become unsustainable, many community members are compelled to seek alternative income sources, such as wage labor, small-scale trade, or migration to urban areas. However, research indicates that these alternatives often provide lower and less stable incomes, leaving former pastoralists vulnerable to poverty and exploitation.

Introduction

The district of Hazara, located in the Khyber Pakhtunkhwa province of Pakistan, is home to numerous indigenous pastoral communities whose livelihoods are intricately tied to traditional land use and livestock rearing. These communities have historically relied on pastoralism as a primary source of sustenance and economic stability. However, the burgeoning mining industry in the region has introduced significant socio-economic and environmental changes that potentially threaten these traditional ways of life. According to a dictionary of environment mining means the act, process, industry of extracting coal, gold, stone, ores and other elements from the earth (C Park, Allaby, 2013). It has long been understood that mining operations are a two-edged sword that may be both an economic engine and a major source of socioeconomic and environmental problems, especially for indigenous communities (Bridge, 2004)

Economic Effect

Mining, as an essential component of Pakistan's economic landscape, underscores the intricate interplay between national development aspirations and the preservation of indigenous rights and environmental integrity. However, the pursuit of mining ventures often intersects with the territories inhabited by indigenous pastoral communities, leading to a clash between economic imperatives and the preservation of indigenous livelihoods and cultural heritage (Naqvi, 1996). This conflict is a perfect example of the overall global fight for socioeconomic challenges, in which indigenous communities are frequently at the front of resistance to extractive entities (Giorgi, 2024).

In the Hazara division, the socioeconomic repercussions of mining on indigenous pastoral people encompass a wide range of challenges, from biodiversity loss and land dispossession to unsustainable livelihoods and environmental degradation. These communities are particularly vulnerable because of their close connection to their ancestral homes, and the presence of mining operations contributes to this vulnerability. Over the course of colonial and post-colonial government, the issue of land dispossession has repeatedly occurred. For indigenous pastoralists, it results in the loss of their ancestral territories, upsetting long-standing patterns of resource use and social cohesiveness (Mallik, 2022). In addition to mining-induced socioeconomic disruptions reverberate through the fabric of indigenous pastoral societies, engendering livelihood loss and socio-political unrest. The mining industry has inherent effects even if its operations generate massive quantities of riches that support the economies of both developed and developing nations. Both positive and bad effects result from this. The degree of both positive and bad effects varies depending on the context and can be affected by extractive activities, location, the economy, technology, the level and degree of workforce training, and the effectiveness of governance.

Problem Statement

The development of mining within the Hazara district has posed major economic pressures to the native pastoral communities whose economic activity is long-standing and founded on livestock rearing and utilization of land. The loss of ancestral grazing areas and degradation of natural resources have cut down on income earning opportunities plunging many pastoralism into economic insecurity. Although mining is a significant source of revenue to a country and development in the industrial sector, the financial fruits of extractive industries seldom trickle down to these communities, leaving them behind in the economic fruits of extractive activities. They, instead, experience the loss of livelihood, increase in poverty, and access to alternative employment opportunities, that, in turn, undermine their economic resilience and further social inequality in the region.

Research Methodology

Introduction

This chapter presents and interprets the data collected through in-depth interviews. The analysis follows thematic patterns based on the study objectives. Each theme is discussed with supporting narratives from participants to understand how mining has affected land use, livestock, environment, and socioeconomic structures in the pastoral community in Hazara District Khyber Pakhtunkhwa and for collecting detailed information.

Methodology of the study

The qualitative research method used, in which text extracted from discussion or conversation is systematically gathered, arranged, and interpreted. It is used to look at the significance of social phenomena from the perspective of people encountering them in their surroundings (Grossoehme, 2014). Two main methods to research methodology are qualitative and quantitative in the social sciences. The in-depth study of human behavior and its influencing aspects is accomplished via qualitative research. Qualitative research is concerned with the reasons behind different facets of

behavior. Rather than focusing on the when, what, and where of quantitative research, it explores the why and how of making choices (Bryman, 2012).

Research Design

Research design refers to the systematic arrangement of all the steps needed in carrying out a research project (Salkind, 2002). It seeks to carry out the investigation in an in-depth way. Research design is carried out to confirm that one effectively addresses the research problem. This study employs an ethnographic approach to deeply understand the pastoral community's perception of mining impacts on their livelihood in Hazara, Khyber Pakhtunkhwa. Ethnography involves immersive observation and interaction within the community to gather rich, contextual data. This research will be based on an ethnography research design.

Data Collection Tools

The method for gathering data is an in-depth interview where qualitative research technique that involves conducting intensive individual interviews with a small number of respondents to explore their perspectives on a particular idea, program, or situation." Conducting in-depth interviews is a useful method for obtaining information on the perspectives and actions of participants. The seven steps of an in-depth interview are thermalizing, designing, interviewing, transcribing, analyzing, confirming, and reporting (Steinar Kvale, 2007). The appropriate questions is included in an interview guide, which the researcher is use as a tool. It is assist in keeping the researcher focused on significant information in the study and on track. This approach allows for a more dynamic and exploratory conversation, enabling a deeper understanding of the interviewee's perspectives (Bryman, 2012).

Sampling Size

Initially 20 respondents is selected from pastoral community of district Hazara for in-depth interviews that can be expanded based on non-saturation. Choosing a small subset of cases from a larger pool and extrapolating them to the entire population is known as a sample (Neuman, 2014).

Sampling Technique

Convenience sampling is employed to select respondents based on their accessibility and availability. A convenience sample is a non-probability sampling method in which data is obtained from population members who are conveniently available to participate in the study . Interviews are conducted with the heads of pastoral communities in Hazara District, Khyber Pakhtunkhwa. These criteria will encompass various aspects, including proximity to mining activities, vulnerability to environmental risks, logistical viability, and financial implications. Interviewees are chosen based on their ability to provide rich data and their availability. The sample is including members from diverse socio-economic backgrounds such as herders, farmers, pastures and local business owners. The researcher will identify respondents through personal connections (family, friends, and village councils).

Universe of Study

The universe of study is the perception of pastoral community towards the effects of mining regarding on their livelihoods of district Hazara Khyber Pakhtunkhwa, Pakistan which are significantly affected by mining. Indigenous pastoral communities have unique cultural practices tied to their economic, and the study can help understand how mining threatens these practices and ways to preserve them.

Analysis

Data analysis is the process of systematically applying statistical or logical approaches to identify, illustrate, condense, and assess the collected data. As the proposed study will be Qualitative study and the collected data analysed as a Thematic Analysis through themes and sub themes. It gives the researcher the groundwork for a theoretical interpretation of their data, allowing them to theoretically contribute to the body of knowledge on the subject of their research. (Bryman, 2012).

Data Analysis and Discussion

Introduction

In the previous chapter, we discussed the methodology and procedures applied during the process of data collection and analysis. However, current chapter focuses on data analysis regarding the Perception of Pastoral community towards the effects of mining on their livelihood in Hazara District Khyber Pakhtunkhwa. Thematic analyses of procedures, steps and phases have been followed to give clear information about the perception of Pastoral community that how mining effects on their livelihood in Hazara.

Socio-Demographic Information

The respondents, primarily male pastorals aged between 28-52 reported significant reliance on livestock as their primary source of income. Livestock types include sheep, goats, camels, cattle, and buffaloes, with these activities contributing to 70-95% of household incomes. Investments are directed toward medicines, fodder, water storage facilities, veterinary care, and animal shelters. Family structures vary, encompassing single individuals supporting parents and married individuals with children. These demographics underline a profound dependence on livestock for economic and social sustainability.

Mining on Land Use Change

According to Mungâ et al., (2019) pastoralists increasingly voice concerns that mining activities pose a severe threat to the sustainability of their traditional livelihoods, which have been passed down for generations. The encroachment of mining operations onto grazing lands, depletion of water resources, and environmental degradation have significantly disrupted herding practices, making it difficult for pastoralists to sustain their livestock-based economy. During the interview of the local pastoral argue that: *“I experience that mining activities have encroached on grazing lands, disrupting traditional herding routes and making waterholes inaccessible. This has caused herders to travel longer distances, leading to increased physical strain and higher transportation costs. Grazing fields and surrounding vegetation have diminished drastically, turning fertile areas into barren land. Respondents noted that species of grass and shrubs critical for livestock nutrition have disappeared.”* (Individual Interview, December 04, 2024).

Reduced Daily Gain and Veterinary Expenses

According to Zaehring et al., (2024) the decline in milk and meat production due to mining-induced environmental degradation has had severe economic consequences for pastoralist communities, directly impacting household incomes and financial stability. With reduced grazing quality, water scarcity, and increased livestock disease, animals produce less milk and have lower growth rates, diminishing the primary sources of food and income for herders. During the interview of the local pastoral argue that: *“Reduced milk and meat production directly impacts income levels. Herders reported difficulty in meeting household expenses, with some being forced to sell livestock at unfavorable prices to sustain their livelihoods.”* (Individual Interview, December 6, 2024).

Economic Challenges

According to George, (2025) the diminishing quality of pastures and the subsequent decline in livestock productivity have had a profound impact on household earnings, particularly in communities that rely heavily on animal husbandry for their livelihoods. During the interview of the local pastoral argue that: *“As grazing lands degrade due to factors such as overgrazing, climate change, and land encroachment, livestock struggle to find sufficient nutrition, leading to lower milk yields, decreased meat production, and higher mortality rates.”* (Individual Interview, December 4, 2024). Habte et al., (2022) argue that the loss of vegetation exacerbates soil erosion, making it even more difficult for grasses to regenerate, creating a vicious cycle of land degradation. If these trends persist, pastoralist

communities may find it increasingly challenging to sustain their way of life, pushing many toward alternative livelihoods that may not offer the same stability or cultural significance. Additionally, another local acknowledge that: *“This decline directly affects household incomes, making it increasingly difficult for families to afford basic necessities, invest in better livestock care, or sustain their traditional way of life.”* (Individual Interview, December 4, 2024).

Income Reduction

According to Abate, T. (2016) mining diminishing quality of pastures and livestock productivity has caused a steep decline in household earnings. Many herders are now considering alternative livelihoods, though options remain limited and often unsustainable. During the interview of the local pastoral argue that: *“Mining deterioration of pasture quality and the resulting decline in livestock productivity have significantly weakened the economic stability of households that depend on animal husbandry.”* (Individual Interview, December 3, 2024). As similar observation was noted in the study of Aggrey (2021) in response to these challenges, some are seeking alternative livelihoods, such as casual labor, small-scale trade, or seasonal migration to urban areas in search of employment. However, these options often fail to provide stable and sufficient income, leaving many in a cycle of economic uncertainty. Additionally, another local acknowledge that: *“Factors such as mining led soil degradation and land-use changes have reduced the availability of nutritious forage, leading to weaker livestock, lower milk and meat yields, and higher susceptibility to disease. As a result, many herders face a steep decline in their earnings, making it difficult to sustain their traditional way of life.”* (Individual Interview, December 6, 2024).

Cost Increases

According to Githiria et al., (2007) mining rising costs for veterinary care, fodder, and alternative water sources exacerbate financial difficulties. Herders reported spending up to 40% more on maintaining their livestock compared to a decade ago. During the interview of the local pastoral argue that: *“The rising costs associated with veterinary care, fodder, and alternative water sources have placed a significant financial strain on herders, further exacerbating their economic difficulties of the pastoral communities due mining”* (Individual Interview, December 4, 2024). Musakwa et al., (2020) also noted that this financial pressure forces many to take on debt, reduce herd sizes, or even consider abandoning pastoralism altogether. Without targeted support in the form of subsidies, improved resource management, and sustainable livestock practices, these rising costs threaten the long-term viability of herding as a livelihood. Additionally, another local acknowledge that: *“With increasing incidences of livestock diseases, driven by environmental changes and deteriorating pasture conditions, the demand for veterinary services has surged, making treatment and preventive care more expensive. Additionally, the scarcity of natural grazing areas has forced herders to purchase supplementary fodder, the prices of which have steadily raised due to inflation and supply chain disruptions.”* (Individual Interview, December 6, 2024).

Seasonal Trade

According to Quinn, et al., (2003) pastoralist communities have long depended on seasonal trade and market participation as a primary economic activity, where they sell livestock, dairy products, and other byproducts such as wool and hides to sustain their livelihoods. The cyclical nature of this trade aligns with traditional herding patterns, allowing pastoralists to generate income at key times of the year to cover household expenses, invest in livestock, and purchase essential supplies such as fodder, medicines, and supplementary food. During the interview of the local pastoral argue that: *“The expansion of mining activities has disrupted this delicate economic balance by severely degrading grazing lands, depleting water sources, and increasing disease outbreaks among livestock. These environmental challenges lead to weaker, undernourished animals with lower meat and milk yields, ultimately reducing their market value.”* (Individual Interview, December 4, 2024).

Conclusion and Recommendation

Conclusion

Mining has profoundly disrupted the livelihoods of pastoral communities in District Hazara, Khyber Pakhtunkhwa, by degrading grazing lands, depleting water resources, and reducing livestock productivity. The loss of fertile pastures and contamination of water sources have led to malnutrition and increased disease among livestock, causing a sharp decline in milk and meat production. This economic strain forces pastoralists to sell livestock at low prices or take on debt, weakening their financial stability and pushing some to abandon their traditional way of life. Additionally, the disruption of seasonal trade and market participation has further limited income opportunities, making it difficult for pastoralists to sustain their livelihoods.

Recommendations

Mining activities impacts on the livelihoods of pastoral communities often leading to environmental degradation resource depletion, socio-economic disruptions, and cultural displacement while the following research-based recommendations are proposed:

- Clarify how land reclamation programs can be realistically implemented with examples or references to local practices.
- Suggest partnerships with local NGOs or government departments for afforestation and soil restoration.
- Propose feasible policy recommendations, like developing “grazing-mining zoning plans” through community input and local government.
- Suggest simple enforcement mechanisms for water-sharing agreements between miners and pastoralists.
- Include practical examples of CSR initiatives that directly benefit pastoralists.
- Propose culturally sensitive approaches to preserving heritage and traditional knowledge.
- Stress realistic compensation mechanisms, such as livestock restocking or grazing rights agreements.

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