

Impact of mining on the livelihood of women in Gashaka local government area, Taraba State

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Abstract: This study focuses on evaluating the impact of mining on the livelihoods of women in Gashaka Local Government Area (LGA) of Taraba State. The primary objective is to examine the effects of mining on the women's livelihoods within this particular community. The research adopted a survey research method, employing a self-constructed questionnaire for data collection with 118 randomly selected respondents. Utilizing a descriptive statistical approach, the study presented its findings through tables and charts. The research revealed that a majority of the respondents are actively engaged in mining, primarily extracting blue sapphire and other stones in the region. Post-mining activities predominantly involve selling the minerals at the Serti main market in Gashaka. Specific mining areas identified include Mayo Jim, Bodel, Garbabi, and Karamti, with Garbabi exhibiting the highest mining activity in Gashaka LGA. The study underscored the substantial impact of mining on the socio-economic well-being of women, positioning it as a major source of empowerment for them. Based on its findings, the study recommends that the government formulate policies to facilitate the responsible development of mining activities in Gashaka LGA. It emphasizes addressing critical issues and providing support to workers to enhance efficiency and reduce stress. Additionally, the research advocates for the implementation of an empowerment program by the state government, specifically targeting women and other miners in the region. This program should offer alternative livelihood sources, mitigate the adverse effects of mining, and discourage illegal mining practices in the area.

Keywords: *Gashaka, Impact, Livelihood, Mining, Nigeria, Women.*

1. Introduction

Mining is an important socioeconomic activity geared towards the socioeconomic development of a nation and her communities. In Nigeria, the mining industries accounts for only 0.3% of its gross domestic product, due to the influence of its vast oil resources. It entails the reason for the underdeveloped, lack of proper exploration and utilization of mining industry across the country, leading to import minerals that it could produce domestically, such as salt or iron ore (Ahmed, Oruonye, & Adamu, 2021). According to Uriah, Gusikit, and Mangs (2013) there are over 40 different types of minerals spread across the country, including gold, coal, barite, bentonite, bitumen, limestone, tantalite/columbite, iron ore, lead/zinc, gemstones, marble, granite, gypsum, lithium, talc, silver, etc. He further stated that less than 5% of these minerals are currently being mined, processed and marketed. These include coal, kaolin, barite, limestone, dolomite, gypsum, feldspar, gold, iron ore, lead-zinc, tin, and niobium and tantalum ores. The remaining 95% of mineral ores, though in demand are untapped. Obaje (2009) stated that all the states of the federation have a share of the nation's mineral inventory.

Artisanal mining refers to small-scale mining operations that are typically carried out by individuals or small groups of people using basic tools and techniques. Artisanal mining is often informal and

unregulated, and can be found in a range of mineral commodities, including gold, diamonds, tin, etc. Artisanal mining can provide a source of income for local communities, but it can also have significant social and environmental impacts. The lack of regulation in artisanal mining can lead to unsafe working conditions, environmental degradation, and conflict with local communities especially for women and children. Artisanal mining is often associated with the use of toxic chemicals, such as mercury, which can have significant health impacts on those involved in mining activities as well as those living in the surrounding area. Additionally, artisanal mining can result in the loss of land and resources, and adverse health effects for miners. Despite the challenges, artisanal mining can also offer opportunities for sustainable development if it is properly regulated and managed. It is important to recognize the role that artisanal mining plays in the livelihood of many women located in mining communities and to work towards creating a more inclusive and sustainable mining sector.

Gashaka local government area in Taraba State is where mining activities are mostly seen among individuals who ventures into the exploration of natural resource for the purpose of sustaining a better livelihood for themselves and family (Ahmed et al., 2021). In other word, the mining activities in Gashaka LGA are mostly done without the consent of government authorities, more like an illegal and unregulated activity. Major activities of its inhabitants include farming and mining over the years and has been the source of livelihood to few people within the region. In terms of farming, variety of crops such as cocoa, maize, soyabeans and potatoes are grown in large quantities in the area. The area hosts a number of markets where a wide variety of commodities are bought and sold. Other important economic activities in Gashaka LGA include blacksmithing, hunting, and mat weaving.

Mining, as a developmental endeavor, makes substantial investments in the communities where these activities occur (Maliganya, Simon, & Paul, 2013). In essence, this investment involves enhancing the skills of the local workforce and establishing infrastructure such as public schools, health clinics, water supply systems, and transportation facilities. Additionally, both the government and local communities anticipate that mining companies will contribute to the growth of entrepreneurial ventures in the area. This is achieved by offering opportunities for supplying materials, commodities, and services to mining companies, miners, and their families.

Holden (2015) asserts that mining companies are expected not only to provide employment opportunities directly to communities during the construction and operation phases but also indirectly through the demand for goods and services from miners. This creates a cycle of revenue generation, circulating currency, and improving the quality of life in mining localities. Additionally, the mining sector contributes foreign exchange and tax revenues, playing a significant role in the country's balance of payments and gross domestic product.

Despite the ideal vision of an active mining sector promoting socio-economic development, global literature reveals varying success, largely due to limited public participation in development processes. McMahan and Remy (2001) argue that sustainable mining activities depend on the level of public involvement, emphasizing constant and genuine engagement between the community, government, and mining company owners. However, in developing countries like Ghana and Tanzania, public participation is often minimal, leading to disparities in benefiting from economic prosperity.

In the case of Ghana, Maliganya et al. (2013) note that despite the growth in the mining sector since economic policy changes in 1983, adjacent communities have not fully enjoyed the economic benefits. Similar challenges exist in Tanzania and South Africa, where weak institutional capabilities contribute to inadequate public goods and services for local communities. This disparity has resulted in civil protests and strained relationships between governments, communities, and mining companies.

In Gashaka Local Government Area of Taraba State, Nigeria, artisanal and unofficial mining dominates, influenced by the federal government's insufficient use of the mining sector. This has led to adverse effects on citizens' lives, including increased unemployment, poverty, environmental degradation, and suboptimal mining practices. Women, especially, face challenges in informal mining, exposing them to risks and contributing to societal disruptions, as highlighted by a 2020 NEITI study.

Given the challenges faced by women in Gashaka LGA, this study aims to investigate the impact of mining on their livelihoods. The research seeks to shed light on the types of mining activities women are involved in, their roles, monthly income generated, environmental issues, and the difficulties they face. The ultimate goal is to raise awareness and provide insights for the governments of Taraba State and Nigeria to address the neglect of the mining sector, potentially strengthening the economy, increasing employment opportunities, and improving the safety and well-being of women in the host community.

2. Review of Some Empirical Studies on Mining

Jaiye (2013) utilized a secondary data collection method in their study on the Environmental Implications of Illegal Mining Activities in Nigeria, specifically focusing on the Pandogari and Barkin Ladi/Buruku Surface Mines in Niger/Plateau States. The study concluded that illegal mining poses a significant threat to ecological stability and environmental health. The unregulated and destructive mining operations conducted by gem seekers and gold diggers lead to substantial damage to the environment. This often results in soil and river pollution, particularly with the use of mercury and cyanide by gold diggers. The paper critically analyzes illegal mining activities, their environmental impact, and proposes remedial measures. Legal measures have proven ineffective in controlling such activities due to the highly mobile and minimally equipped nature of the mining involved. Large numbers of miners congregating make supervision challenging, leading to damage to both the physical and biological environment and heightened social tensions among various interest groups.

Thomas, YinFei, Bright, and Fred (2020) conducted a study titled "Illegal Mining and Sustainability Performance: Evidence from Ashanti Region, Ghana." Using a multidisciplinary literature review and empirical data from 250 respondents in the Atwima Nwabiagya and Atwima Mponua Districts of Ghana, the study employed structural equation modeling to test a proposed model and hypotheses. The research found that all three sustainability performance factors were adversely affected by illegal mining activities. Furthermore, a strong positive correlation was observed among sustainability performance components, highlighting the interconnectedness of these factors. This study represents a valuable empirical evaluation of how illegal mining influences sustainability performance, departing from the theoretical focus predominant in existing research on the subject.

George (2012) explored the environmental impact of small-scale mining operations in Ghana, particularly in Akwatia. Despite contributing to the country's economic growth, the mining industry in Ghana, as highlighted by the study, brings forth various issues, including political, social, environmental, and health-related challenges in Akwatia. The negative effects of illicit mining, locally known as "galamsey," include the loss of agriculture and means of subsistence. Public awareness and education are identified as crucial for addressing these challenges, as the community must recognize the consequences of current circumstances to mitigate future environmental and public health impacts.

Ahmed and Oruonye (2016) conducted research on the socioeconomic impact of artisanal and small-scale mining in the Mambilla Plateau in Taraba State, Nigeria, estimating over 5,000 artisanal miners in the area. Additionally, Ahmed et al. (2021) examined the dynamics of artisanal gold mining in Gashaka Local Government Area of Taraba State, noting a lack of protective gear among miners. Abdelaal et al. (2023) observed clustering of artisanal and small-scale gold mining activities around the Nile waterways in Egypt, emphasizing mercury contamination sources and their impact on surrounding receptors.

In light of the empirical review, it is evident that previous studies vary in geography, focus, and methodology. The majority of these studies differ from the present research, which is centered on Gashaka Local Government Area in Taraba State, Nigeria, and specifically investigates the impact of mining on women's livelihoods. Recognizing the gap in the literature, this study aims to contribute new insights and knowledge to address this specific context and its implications.

3. Materials and Methods

3.1. The Study Area

Gashaka Local Government Area (LGA) is situated in the Southeast of Taraba State and extends to approximately between $11^{\circ}00'–12^{\circ}00'E$ and $07^{\circ}30'–08^{\circ}00'N$. This LGA is bordered to the Southeast by the Republic of Cameroon, to the north and east by Adamawa State, and to the west by Kurmi and Bali LGAs while to the south by Sardauna LGA [Figure 1](#).

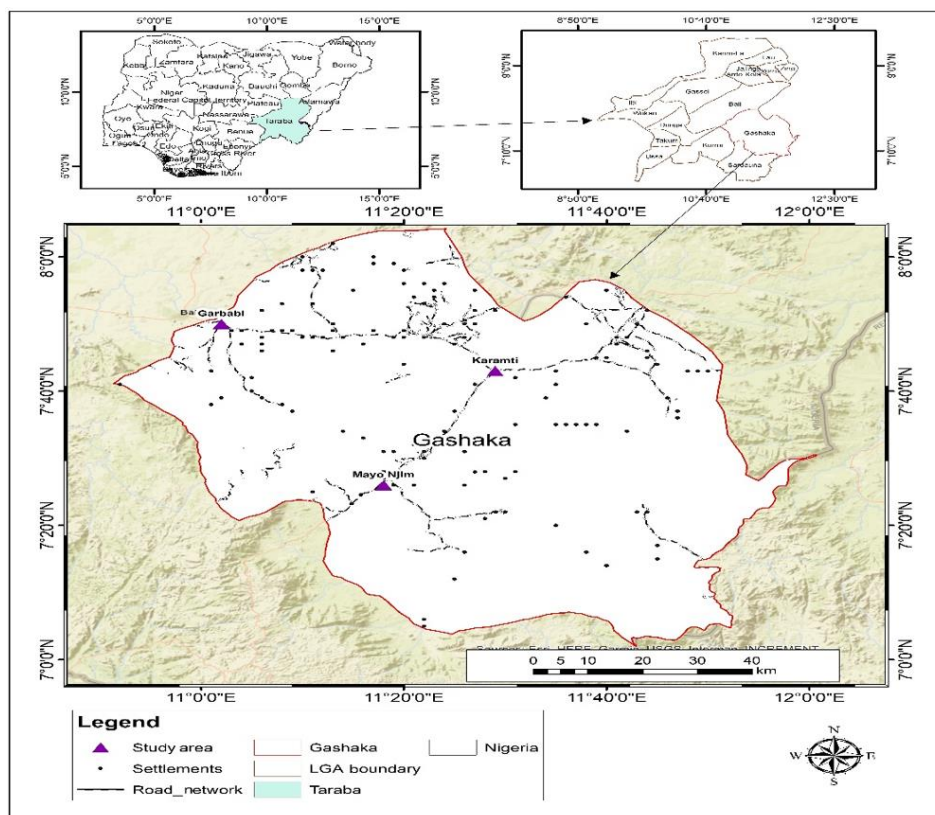


Figure 1.
Map of the study area: Gashaka local government area.

Situated within Nigeria's distinctive Guinea savannah, this region boasts a mountainous terrain and unpredictable atmospheric conditions that range from tropical moist-humid to dry-humid in the lowlands and sub-temperate in the highlands. The rainy season spans from April to November, while the dry season prevails from November to April. The inhabitants of Serti, the Local Government Area (LGA) headquarters, mainly consist of government employees, small-scale traders, and members of the armed forces. Primarily revolving around agriculture, the residents of these rural areas engage in hunting, fishing, and peasant farming.

The southern border is encompassed by the Gotel Mountains, where the elevation reaches a peak of 2,419 meters above sea level. The challenging terrain is difficult to access, and the diversity of habitats with varying microclimates contributes to a range of plant types. While the land is mostly level in the northern quarter (Gumti), it occasionally undulates and slopes slightly ([Akinsoji, 1996](#); [Kwesaba, Daniel, Delphine, & Benjamin, 2023](#)).

Notably, the Barup and Tunga waterfalls in the Gashaka-Gumti National Park stand out among the numerous natural waterfalls in Taraba State. The federal government has proposed a hydroelectric dam project near the Barup waterfall on the Mambila plateau. The region is drained by the Benue and Niger

rivers, along with streams, artificial lakes, rivers, and seas. The natural drainage through surface and subsurface water helps prevent water logging and anaerobic conditions in most agricultural soils.

The drainage pattern in the area is characterized by radial drainage, resembling spokes, as streams or tributaries run outward and downward from a dome or volcanic cone (Elijah, Ojeh, Philip, Maaku, & Bonchak, 2019). Gashaka is situated in the northern Guinea savanna zone, characterized by tall trees and scattered bushes among the grasslands. Trees such as locust bean, shear-butter, eucalyptus, baobab, and silk cotton are prevalent in this region. The mountainous study area, composed of rocks, includes the moon, a terrestrial planet with substantial characteristics. Figure 2 illustrates the geological features of the state. While the study area is free of natural hazards, the impact of mining activities on environmental remediation remains unclear. The study area supports plate tectonics, which is crucial for mineral exploration, hydrocarbon evaluation, and water resource assessment.

Various types of minerals are found in the Gashaka area, including non-metallic minerals like limestone and bentonitic clay, metallic minerals like barite, bauxite, and galena, as well as precious stones like sapphire, tourmaline, and crystal quartz. Gold mining, conducted since the 1940s by Europeans, is a significant artisanal activity in Gashaka LGA, providing opportunities for livelihood and meeting basic needs amid rising unemployment and poverty in the state and local communities (Ahmed et al., 2021). Additional information about minerals discovered in Taraba state, their uses, and locations within the state can be found in the Appendix section.

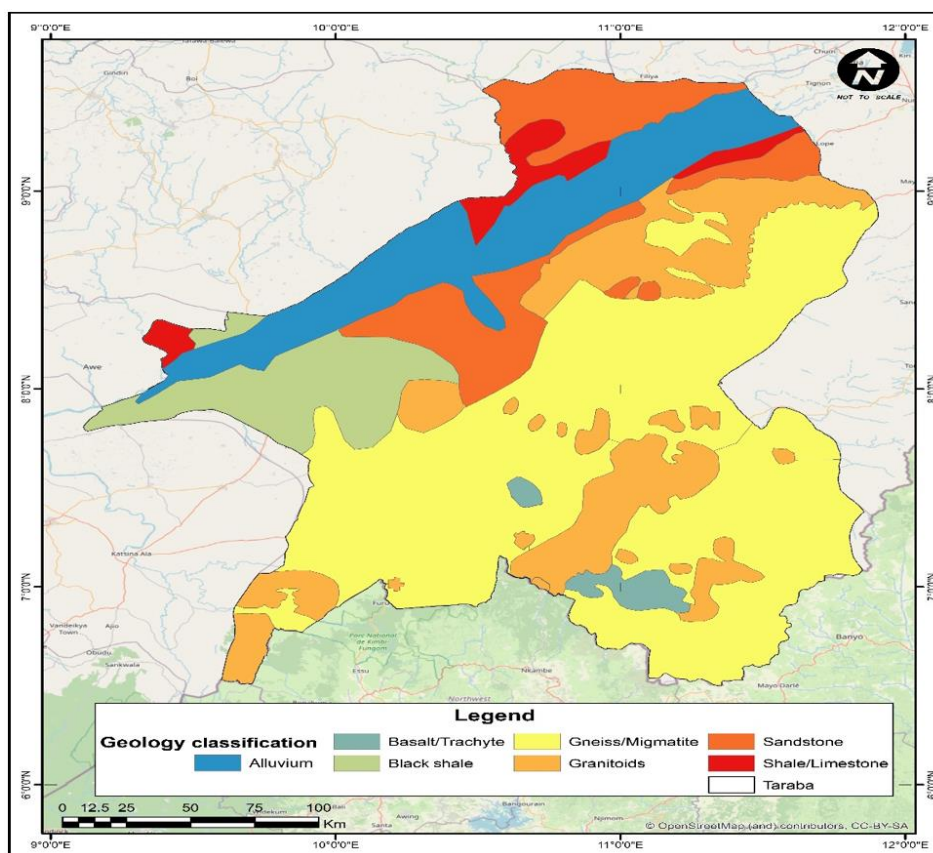


Figure 2.
Geological map of Taraba State.

As of the 2006 population census, Gashaka Local Government Area (LGA) is home to 87,781 residents, with an anticipated annual growth rate of 3% (Elijah et al., 2019). The region is characterized

by a diverse ethnic composition. In the southern part of the park, ethnic groups such as Jibu, Dakka, Ndoro, Tigun, Gbaya, Tiv, Mambilla, Kaka, and Fulani are predominant in Gashaka LGA. Meanwhile, in the northern sector, known as the Toungo sector, key ethnic groups include Chamba, Kutim Potopore, Fulani, Dakka, Nyamnyam, and Kona. The Hausa language serves as a widely used medium for social and business communication in the area.

The people living in the area are mostly farmers, hunters, civil servants, and business men. The predominant farmers based on roots crops, fruit crops, and vegetable, which includes cassava, yam, (root crops) while in fruits crops are cashew, garden egg, mango, guava, orange, banana, palm trees, pawpaw and other domestic animal kept are fowls, goat, sheep, pig, duck, rabbit, dog etc. all are kept for skill and other purpose. The region is also a haven of tourism activities especially the Gumti National Park which aside other activities also which has museums of Natural History at the Head Office at Serti and Toungo Range Office.

3.2. Methods

This study employed the survey research design to assess the impact of mining on the livelihood of women in a host community with particular reference to Gashaka Local Government Area and followed a quantitative approach to collect both continuous and discrete dataset.

The sources of data used in this study are both primary and secondary. The primary data were obtained directly from those who were selected into the sample for the purpose of completing the questionnaires to the raised in the course of this study, they are people of various wards in Gashaka LGA, Taraba State. The secondary data was from published articles and archival climatological records and women in mining statistics which covers the study area.

Data was collected through the administration of questionnaires. The researcher personally visited all the women miners and respondents in the study area to administer the questionnaire. Additionally, the KAPB was used to collect data. KAPB refers to the acronym for "Knowledge, Attitudes, Practices, and Behaviors," which is a common framework used in research to assess people's understanding, beliefs, and behaviors related to a particular topic or issue. By using the KAPB framework, we can gain a better understanding of people's perceptions and behaviours related to women in mining and their livelihood and developed more effective strategies to address any knowledge gaps or misconceptions.

The target population of this study comprised all women involved in any form of mining activities in Gashaka LGA. This makes up a total of one hundred and eighteen (118) women, according to the [Local Association of Miners \(2023\)](#). Since the population of women who are involved in mining activities in the study area is not so large, the researchers covered all of them. Therefore, the total sample size of the research work was 118 respondents. These were sampled using purposive sampling technique in order to ensure that the right people within the population were selected. The questionnaire was constructed by the researchers with the title, "Impact of Mining on the Livelihood of Women Questionnaire (IMLWQ)". This was used to obtain information for this research alongside the Knowledge, Attitude, Practices & Behaviour (KAPB) questions. The questionnaire was divided into two sections i.e. A and B. Section A sought information of demographic data of respondent while section "B" comprised of items on the impact of mining activities on women in Gashaka LGA, however, the KAPB were open-ended to allow for respondents to express themselves fully.

The method of data analysis was descriptive and inferential statistical method. Descriptive and inferential statistical tools such as simple percentages and chi-square was used to analyze the responses of each statement collected, because it is the most appropriate statistical technique needed to be employed. The responses were grouped according to their similarities. This aided the researchers to outline the findings of the research work by analyzing and making use of the response with the highest percentage. The analyzed data were presented in cartographic tables, charts and maps.

Table 1.
Demography of respondents.

S/N	Variables	Items	Frequency	Percentage (%)
1.	Location	Mayo Jim	23	19.4
		Garbabi	56	47.5
		Karamti	39	33.1
		Total	118	100.0
2.	Marital status	Married	73	61.9
		Widowed	21	17.8
		Single	24	20.3
		Total	118	100.0
3.	Academic qualification	SSCE/GCE	58	49.2
		OND/NCE	18	15.3
		HND/First degree	3	2.5
		Primary FSLC	39	33.1
		Total	118	100.0

Note: SSCE= Senior secondary certificate examination.

GCE = General certificate examination.

HND = Higher national diploma.

FSLC = First school leaving certificate.

4. Results and Discussions

4.1. Demographic Characteristics of Women Miners in Gashaka LGA

The demography of the respondents is shown in [Table 1](#). The result reveals that 19.4%, 47.5% and 33.1% of the women miners resides in Mayo Jim, Garbabi and Karamti respectively. The result further revealed that more of the women miners are located in Garbabi.

This concentration could be attributed to the proximity of Garbabi to Bali town in Bali LGA where most of the minerals mined in Gashaka and other locations are sold as the collection and sales office of proven mineral buyers are located there.

The [Table 1](#) also showed the marital status of the women in mining. The result reveals that 61.9%, 17.8% and 20.3% of the women are married, widowed and single respectively. It is evident that there are more married women that into the Artisanal mining business in Gashaka than the widowed and single women.

An interview with the president of Women in Mining in Taraba State revealed that she was introduced to the mining over 25 years ago by her late husband and she has remained in the business of buying and selling precious stones 15 years after her husband's demise and had used the proceed to train all their children up to the university level. The same [Table 1](#) shows the academic qualification of the women in mining in Gashaka LGA. The result reveals that 49.2%, 15.3%, 2.5% and 33.1% have the Senior secondary school certificate, the Ordinary National Diploma/ National certificate in Education, the Higher National Diploma/ first Degree certificates and the primary first school leaving certificate respectively.

It was observed that most of the women educated themselves with the proceeds from their engagement in mining as their source of livelihood.

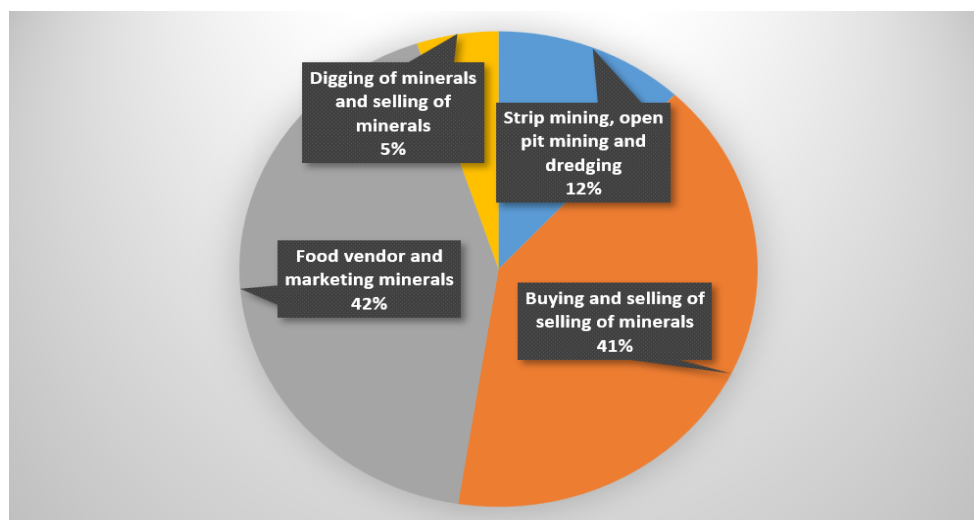


Figure 3.
The type of mining activities women miners engages in at Gashaka LGA.

4.2. Types of Mining Activities Engaged in by Women in Gashaka LGA

Figure 3 shows the type of mining activities that women miners are engaged in at Gashaka LGA. The study reveals that the type of mining activities carried out by women miners are strip mining, open pit mining and dredging with 14 (12%), buying and selling of minerals with 48 (41%), food vendor and marketing of minerals with 50 (42%) and digging of minerals and selling of minerals with 6 (5%). This implies that majority of the respondents are engaged in a combination of food vending business and marketing of minerals from other diggers especially the male counterparts. However, a very close proportion are into buying and selling of minerals with only a few actually involving themselves in the digging. Women miners in Gashaka LGA pay young males (youth) to do the digging for minerals while they wash and sell the found rocks, and markets them either within or outside the LGA. Most of the minerals are sold in Bali Mineral market and those who want better value take them up to Abuja, Nigeria's capital city for better returns. In cases, the proceeds are shared after sales based on negotiation between the diggers, washers and sellers.

Table 2.

Type of minerals that women miners mine/markets.

S/N	Item description	Frequency	Percentage
1.	Blue sapphire, aquamarine and precious stones, gold and silver	14	11.9
2.	Blue sapphire, aquamarine	37	31.4
3.	Blue sapphire and crystal quartz	41	34.8
4.	Gold and blue sapphire	2	1.7
5.	Tourmaline, blue sapphire and aquamarine	21	17.8
6.	Zinc and blue sapphire	1	0.8
7.	Topaz and aquamarine	1	0.8
8.	Tourmaline and aquamarine	1	0.8
Total		118	100%

Table 2 presents information on the type of minerals that women miners in Gashaka LGA. These are blue sapphire, aquamarine and precious stones with 14 (11.9%), blue sapphire and aquamarine with 37 (31.4%), blue sapphire and crystal quartz with 41 (34.8%), gold and blue sapphire with 2 (1.7%),

tourmaline, blue sapphire and aquamarine with 21 (17.8%), and the rest of the respondents both had 1 (0.8%) response were engaged in mining zinc and blue sapphire, Topaz and Aquamarine and Tournaline and Aquamarine respectively. This implies that majority of the women miners are engage in mining more of blue sapphire, among other stones in the region.

Table 3.
Ways of selling minerals by women.

Item no	Item description	Frequency	Percentage
1.	Sold at local market and to people coming to buy from the site	16	13.6
2.	Sold to external dealers within and across the country	11	9.3
3.	Sold to buyers in Bal/Serti main markets	91	77.1
Total		118	100%

4.3. Monthly Revenues Generated by Women through Mining Activities in Gashaka LGA

Women miners were asked how they sell their minerals and the following responses were received as presented in [Table 3](#). It reveals that the minerals are being sold at local market and to people coming to buy from site with 16 (13.6%), sold to external dealers within and across the country with 11 (9.3%) and sold to buyers in Bali/Serti main market with 91 (77.1%). This implies that majority of the minerals mine in Gashaka LGA are sold to buyers at Bali/Serti main market, Gashaka LGA. The selling of minerals very close to the source is known to reduce the gain that should have accrued to the sellers if they were sold in distant markets or improved with beneficiation value addition.

Table 4.
Response on the impact of mining on the socio-economic status of women in Gashaka.

Item no	Item description	SA	A	%	D	SD	%	Total
1.	Mining improves the financial stability of women in Gashaka community	62	18	67.8	22	16	22.9	118
2.	Mining improves women's understanding about minerals and environmental endowment in Gashaka community	42	45	73.8	-	31	26.2	118
3.	Mining gave women a voice that is heard in Gashaka community	21	73	79.7	16	8	21.3	118
4.	Mining helps women in Gashaka community to be a better mom by contributing toward the wellbeing of their family	34	68	86.4	8	8	13.6	118
5.	Mining activities pave ways for better opportunity at life to women in Gashaka	88	16	88.1	6	8	11.9	118

From the [Table 4](#), questionnaire item 1, shows that 67.8% respondents agreed and strongly agreed that mining improves the financial stability of women in Gashaka community, while 22.9% disagreed and strongly disagreed to the statement posed. This revealed that mining improves the financial stability of women in Gashaka community. In item 2 indicates that 73.8% of the respondents agrees that mining improves women's understanding about minerals and environmental endowments in Gashaka community, while 26.2% of the respondents are of the opposite view expressed by majority of the women minners as they are not yet skilled to identify so much minerals in the area. However, an interview session with the president of Women in Mining, Taraba State, Mrs Cecilia Oscar shows that

she could identify over 20 minerals with both their English and local names with over 15 years' experience in mining practice. This implies that the engagement in mining as a source of livelihood improves women's understanding about minerals and environmental endowment in Gashaka community. Similarly, item 3 reveals that 79.7% both agree and strongly agreed that mining gave women a voice in Gashaka community, with miners of a different view of 21.3% who disagree and strongly disagreed to the statement posed. This implies that economic empowerment from mining activities made the women more economically relevant to have a voice when desires are taking in the community are being made. For the item, 4, the study reveals that 86.4% of the respondents both agree and strongly agreed that mining helps women in Gashaka community to be a better mom by contributing toward the wellbeing of their family, while, 13.6% of the respondents opposes the statement by responding with disagreed and strongly disagreed respectively. Lastly, item 5 in the [Table 4](#) indicates that majority of the 88.1% of the population sampled are of the view that Mining activities pave ways for better opportunity at life to women in Gashaka while 11.9% are of the opposite view rather than the one elaborated above. Thus, the data presented in [Table 4](#) revealed that mining activities has positive impact on the socio-economic status of women in Gashaka LGA. This implies that through mining, women in the study area has been able to contribute effectively toward the wellbeing of their family, and their career in general. The result is congruent with [Bailey-Kruger \(2012\)](#); [NEITI \(2020\)](#); [Romano and Papastefanaki \(2020\)](#); [Ofosu, Torbor, and Sarpong \(2022\)](#) and [Valadares, De Carvalho Neto, Mota-Santos, and Diniz \(2022\)](#).

Table 5.
Responses on the psycho-social effects of mining on women in Gashaka LGA.

Item no	Item description	SA	A	%	D	SD	%	Total
1	Mining activities carried out by women in Gashaka has negative on their mental health	11	14	21.2	72	21	79.8	118
2	Mining activities reduce the feminism status of women and also affects their emotional wellbeing	21	38	50.0	25	34	50.0	118
3	Mining activities deprive women of normal social association with other women who are not involved in mining activities	46	54	84.7	12	6	15.3	118
4	Women involvement in mining activities in Gashaka community has attracted bad comments from the general public	21	38	50.0	25	34	50.0	118
5	Women who are involved in mining hardly spend time with their family and husbands	21	38	50.0	25	34	50.0	118

[Table 5](#) shows the Psycho-social effects of mining on women in Gashaka LGA. The result shows that 79.8% of the respondents disagreed that mining activities carried out by women in Gashaka has negative effect on their mental health while 21.2% are of the respondents affirmed that mining indeed has a negative effect on the mental health of the women in mining in the study area. Furthermore, [Table 5](#) revealed that 50% of the women miners agreed that mining activities reduce the feminism status of women and also affects their emotional wellbeing. While the other half of the respondents (50%) however disagreed. This implies that mining has its effect on women's emotional state but not all women who are engaged in mining activities experiences those negative changes. Similarly, [Table 5](#)

shows that 84.7% of the respondents strongly agreed and agreed that mining activities deprive women of normal social association with other women who are not involved in mining activities, while 15.3% of the respondents disagree and strongly disagreed. The [Table 5](#) further indicated that 50% of the respondents agreed that women involvement in mining activities in Gashaka community has attracted bad comments from the general public, while 50% of the respondents disagreed. This implies that the issue of passing a bad comment on someone's source of livelihood especially for women in mining has so significant effect on the emotional psyche and work morale women in mining activities in the Gashaka.

[Table 5](#) further revealed that 50% of the respondents agreed that women in mining hardly spend time with their family and husbands while 50% debunk the statement. It can be further deduced that mining activities as a socio-economic activity by women somehow affect their role as wives and mothers in the family.

Table 6.

Responses on the effect of mining activities on security and peaceful-coexistence in Gashaka LGA.

Item no	Item description	SA	A	%	D	SD	%	Total
1	Mining activities causes security threat to women who are successful in the business.	88	16	88.1	6	8	11.9	118
2	Mining activities deprive women of peaceful co-existence with some men in Gashaka LGA	21	18	33.1	25	54	66.9	118
3	Mining attracts some form of illegal business and transactions in Gashaka LGA	39	19	49.2	46	14	50.8	118
4	Mining activities affect the efforts of security agency in enforcing law and order in Gashaka LGA	8	16	21.3	73	21	79.7	118
5	Mining activities has increase the rate of crimes in Gashaka LGA	8	4	10.2	73	31	89.8	118

[Table 6](#) presents the responses on the effect of mining activities on security and peaceful-coexistence in Gashaka LGA. It reveals that, 88.1% of the respondents agree and strongly agreed that mining activities causes security threat to women who are successful in the business but 11.9% disagreed and strongly disagreed. In another item of [Table 6](#) revealed that 33% of the respondents agreed and strongly agreed that mining activities deprive women of peaceful co-existence with some men in Gashaka LGA while 66.9% disagreed. This implies that mining activities does not deprive women of peaceful co-existence with some men in the study area. Furthermore, [Table 6](#) shows that 50.8% unanimously agreed that mining attracts some form of illegal business and transactions in Gashaka LGA while 49.2% disagree and strongly disagreed. Similarly, [Table 6](#) revealed that only 21.3% of the respondents accepted that Mining activities affect the efforts of security agency in enforcing law and order in Gashaka LGA, while 79.7% of the population disagreed to the statement posed. This implies that Mining activities do not affect the efforts of security agency in enforcing law and order in Gashaka LGA. The last item in [Table 6](#) shows that, 89.8% of respondents disagree and strongly disagreed that mining activities do not lead to any increase in the rate of crimes in Gashaka LGA while only 10.2% disagreed. This implies that mining activities do not lead to any increase in the rate of crimes in Gashaka LGA but take away idle minds from crimes as they engage in it thereby reducing crime rates in the society.

Table 7.
Environmental problems facing mining activities.

Item no	Item description	Frequency	Percentage
1.	Strongly agree	117	99.2%
2.	No response	1	0.8%
Total		118	100%

Table 7 shows the respondent's perception on whether there are environmental problems facing mining activities in the area. It shows that 99.2% strongly agreed that there are environmental problems facing mining activities in the area and only 0.8% perceived differently. This implies that environmental factors affect mining activities in the region. This is at tandem with literatures.

Table 8.
Response on the environmental problems respondents encounter.

Item no	Item description	Frequency	Percentage
1.	Loss of biodiversity, and it causes soil erosion, and can lead to water pollution	14	11.9%
2.	Land degradation, soil erosion, and water pollution	100	84.7%
3.	Erosion and land degradation	3	2.5%
4.	No response	1	0.8%
Total		118	100%

Table 8 shows the responses on the nature or type of environmental problems associated with mining activities in the study area. It revealed that mining leads to the loss of biodiversity, soil erosion, and water pollution (11.9%), Mining leads to land degradation, soil erosion and water pollution (84.7%). Mining leads to erosion and land degradation (2.5%) respectively. This implies that the major environmental problems cause by mining based on the respondents' perception are land degradation, soil erosion and water pollution.

Table 9.
Response on how can the environmental problems be solved.

Item no	Item description	Frequency	Percentage
1.	Eco-friendly equipment should be used, rehabilitation mining site, shutting down illegal mining	14	11.9%
2.	Reduced or stop mining activities in affected areas	66	55.9%
3.	Sensitization and spreading awareness on the danger of mining	1	0.8%
4.	Stop all mining activities in the study area	32	27.1%
5.	Reserve a place for mining	4	3.4%
6.	No response	1	0.8%
Total		118	100%

Table 9 presents information how the environmental problems caused through mining could be solved. The result shows that 11.9% of the women miners opted for the use of eco-friendly equipment, rehabilitation of mining site, and shutting down of illegal mining while 55.9% opinion is that reducing or stopping mining activities in affected areas could help as 0.8% opted for sensitization and spreading awareness on the danger of mining as 27.1% believe that stopping all mining activities in the study area is the best option. Further, 3.4% views reserving a place for mining activities could help and another 0.8% of the could not make any choice. From the responses, reducing or stopping mining activities in

affected areas is the best approach to solve the environmental problems associated with mining in Gashaka LGA.

Table 10.
Changes in season effect on mining activities.

Item no	Item description	Frequency	Percentage
1.	Low mining activities and draught in dry season	117	99.2
2.	There are high mining in rainy season and low in dry season	1	0.8%
Total		118	100%

4.4. Challenges of Women in Mining Industries in Gashaka LGA

Table 10 presents information how the changes in season affect mining activities. The result shows that 99.2% and 0.8% of the respondents perceives that there are low mining activities in rainy season due to heavy rainfall whereas dry season affect mining because of draught which makes the ground to be strong and high mining takes place during rainy season and low in dry season respectively. The finding revealed that both rainy and dry season have effect on mining activities in the study. However, it was observed that most rainy seasons, the women leave the mining environment to engage in other economic activities such as farming and trading.

Table 11.
Coping strategies for women in mining during unfavourable season.

Item no	Item description	Frequency	Percentage
1.	Focus less on mining, and concentrate on something more lucrative to help boost income within the mining sector.	14	11.9%
2.	Switch to another source of income	104	88.1%
Total		118	100%

Table 11 shows the views of the respondents on their coping strategies due to seasonal changes in the environment. The Table 11 revealed that when the season is not favourable for mining activities, 11.9% of the respondent focus less on mining and concentrate on something more lucrative within the mining sector to help boost their income where 88.1% of the respondents unanimously revealed that when the season is not favorable, the switch to another source of income in order to sustain living like trading and farming.

5. Conclusion and Recommendation

The study anchored on the Impact of Mining on the Livelihood of Women in Host Community, with a particular reference to Gashaka Local Government Area, Taraba State Local Government Area, Taraba State. The study revealed that mining activities in Gashaka LGA mostly take place in Garbabi. The most mined precious stone as contain in the study is Blue Sapphire among others like Aquamarine, and Tournaline. The study found that mining activities usually posed threat to the society by causing land degradation, soil erosion, water pollution and loss of biodiversity. It was also found to be beneficial to women who engage in it. According to the data analyzed and findings made, mining activities in the study area has impacted immeasurably on the socio-economic wellbeing of women, hence serving as one of the major source of empowerment to them. It also indicates that even though mining activities has been profitable to the women who engaged in them in Gashaka LGA, their also tend to be some setbacks in times of being available with family and children at all times. This implies that through mining women in the study area are able to meet up with their family needs and could contribute meaningfully to the wellbeing of their children. Mining activities also have been linked to other better

opportunities for enjoyed by most women in Gashaka LGA, hence it has been found to be one of the effective tool for the wellbeing of women. Even though the potential economic benefits of mining are acknowledged in Gashaka Local Government Area among women who engage in it, there are also some challenges resulting from this activity. This include their inability to be available at all times for the husbands and children, hence the need for better strategies to be adopted to balance this loophole. Moreso, it was revealed that mining activities also posed threat to the environment by contributing to land degradation, water pollution, soil erosion and loss of biodiversity. Based on the findings of the study, the following recommendations are made:

- i. The government should come up with a policy that will see the proper development of the mining activities in Gashaka LGA by meeting up with the pressing of works and workers in order to relief stress and promote efficiency of work and services.
- ii. Women in the mining industries should be given some benefits such as adequate break to that will enable them to meet up with the need of their family and children. This is to help curtail the negative effect of mining among married women in the industry.
- iii. There is a need for mining firms to adopt effective counselling policies that will help to minimize the psycho-social effect of mining on women. This will go a long way to enhance the emotional and mental health of women in the mining sector, thereby enhancing their productivity in their assigned tasks.
- iv. There is the need for women to be given equal voice in the mining industry as much as their male counterpart. This is to give them a huge sense of belonging. It will also impact positively on their mental state of being.

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Institutional Review Board Statement:

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Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

Competing Interests:

The authors declare that they have no competing interests.

Authors' Contributions:

Both authors contributed equally to the conception and design of the study. Both authors have read and agreed to the published version of the manuscript.

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Appendix

Table 1. Some of the minerals discovered in Taraba State.

S/N	Mineral	Locality	Some unknown industrial uses	Remarks
1.	Cassiterite	Gashaka, Kurmi, Sardauna	Production of tin bearing metal, for alloy and tin plating and tin salts for dyeing and printing,	Worked at Serti in 1949, existing potential yet to be re-evaluated but field sample collected for exhibition.
2.	Columbite	Gashaka, Kurmi.	Production of ferrotantalum alloys in the manufacture of rockets and aircraft.	Worked on at Serti in 1940s. Existing potential yet to be re-evaluated but field sample collected for exhibition.
3.	Limonite	All the sixteen LGAs of the State.	Production of Iron and Titanium oxide for industrial chemical.	Location of occurrences are numerous and known. Found mostly as heavy mineral fraction of stream sediments in most parts of the State.
4.	Magnetite	All the sixteen LGAs of the State.	Production of iron and steel for construction tools and machineries.	Ascertained location of occurrences, samples collected for exhibition.
5.	Molybdenite	Bali, Gashaka, Kurmi, Sardauna.	Production of various metal alloys that are extremely hard, tough and can withstand very high temperature.	Location of occurrences known, sample yet to be evaluated.
6.	Rutile	Bali, Donga, Gashaka, Kurmi, Sardauna, Takum, Ussa.	The chief sources of titanium oxide for industrial chemicals.	Sampled and tested. The TiO ₂ content of most collected sample is greater or equal to 60%
7.	Barite	Bali, Gashaka, Ibi, Karim Lamido, Sardauna, Wukari, Gassol	More than 95% of total world production is used in drilling crude oil. Enameling iron for bath, use in chemical paints, fillers, paper, cloths, cosmetics, and in Rubber industry.	Reserves not determined yet; but have been commercially produced in Ibi and Karim Lamido LGAs, since 1990 up to date. The S.G ranges from 4.0 — 4.5 and at depth it occurs with sulphides such as Galena, Azurite and Malachite.
8.	Feldspar	Ardo-Kola, Bali, Donga, Gashaka, Jalingo, Kurmi, Takum, Ussa, Yorro, Zing.	For ceramic products and used in the making of glass, used as insulator, production of opalescent glasses, abrasives, and paints.	Sampled for exhibition and potential yet to be determined.
9.	Graphite	Gashaka, Kurmi	In the production of pencils, Batteries, paints, lubricants, electro-plating and molds in metal works.	Sampled tested and found to contain 95% graphite carbon on beneficiation and has recovery of 80% with separation efficiency above 70%. However the reserve is not yet determined.
10.	Milky quartz	Bali, Gashaka, Kurmi, Sardauna, Yorro, Zing.	In production of glass and abrasives.	Occurs in veins and pegmatite's sampled for exhibition, reserves unknown.
11.	Muscovite	Ardo-Kola, Bali, Gassol, Kurmi, Takum, Ussa, Yorro, Zing, Sardauna.	In production of electrical insulators and roofing materials. Production of capacitors, rheostats, wall paper, lubricant fillers, paints, ceramic, explosive.	Occurs abundantly in numerous veins and pegmatites. Reserves not yet determined.
12.	Quartzite	Ardo-Kola, Donga, Gashaka, Takum, Ussa,	In the production of abrasives, glass and silica wares. Use in construction and building works	Many extensive quartzite ridges occur in different parts of the state. A notable one is the 5km long Nukunya

S/N	Mineral	Locality	Some unknown industrial uses	Remarks
		Yorro.		quartzite ridge in Donga LGA. Reserves not yet determined.
13.	Rose Quartz	Donga, Takum	Mostly used for Jewelleries.	Reported occurrence with obtained samples. The prospect is yet to be determined.
14.	Chalcydopnic Agates	Donga, Takum Gashaka	Often used as an ornamental stone for carvings, beads and cabochons.	Sampled from various known locations. Reserves not known.
15.	Morion	Bali, Gashaka, Kurmi, Sardauna, Takum, Ussa	As semi gemstones for jewelleries and production of room decorators.	Reported occurrence with obtained samples. Evaluation of deposits yet to be done.
16.	Rubby	Bali, Gashaka, Karim Lamido, Kurmi, Sardauna, Yorro	As semi gemstones for jewelleries production of abrasives and disks.	Reported occurrence with obtained samples. Prospect yet to be investigated.
17.	Sapphire	Bali, Gashaka, karim Lamido, Kurmi, Sardauna.	As semi gemstones for jewelleries.	Deposits not investigated but worked. An unknown quantity of sapphire has been worn from deposits in Sardauna and Karim Lamido LGAs of the state through illegal mining operators.
18.	Tourmaline	Bali, Gashaka, Kurmi, Sardauna, Takum, Ussa.	As semi gemstones for jewelleries and manufacture of pressure gauges, radio transmitters.	Reported occurrence with obtained samples. Prospects are many bit yet to be investigated.
19.	Gold	Gashaka, Kurmi	In jewelleries and currency production worldwide, use in production of scientific instruments, & dental appliances.	Worked at Sert (Gashaka LGA) and Galea (Kurmi LGA) in the 1940s by the Europeans. The deposits need to be re-evaluated for exploitation.

Source: [Angye \(2020\)](#).