



# THE IMPACT OF ARTISANAL MINING ON AGRICULTURAL PRODUCTION AND FOOD SECURITY IN THE BIRIM NORTH DISTRICT OF GHANA

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## ABSTRACT

### Aim of the study

Mining operations can negatively impact population's capacity to obtain nutritious food. This study examines the complicated link between artisanal mining, agricultural production, and food security in the Birim North District of Ghana.

### Material and methods

The study employed questionnaires, focus group discussions (FDGs), and GIS analysis, to understand the thoughts and experiences of people in artisanal mining communities, in order to find out how they understand and think about food security.

### Results and conclusions

The GIS analysis identified Afosu and Ntronang communities with perceived impact of mining on food security, due to the fact that these communities lived in areas adjoining a large-scale mining company. The results from the survey and focus group discussion demonstrated that the studied communities were generally worried about access to food, focusing on reduced farmland and fertile soil. Respondents were also concerned about the range, price, and availability of locally grown crops. These results show how important it is to act quickly and in a wide range of ways to reduce the negative impact of artisanal mining on agricultural output. In this case, it is very important to use sustainable mining methods in the study area and other places like it by giving priority to sustainable land management.

**Keywords:** food security, illegal mining, mining impact, agriculture, GIS

## INTRODUCTION

The rising price of minerals and the growing difficulties of making a livelihood through agriculture and other rural pursuits has increased tremendously the activities of artisanal mining in recent years (Fritz et al., 2014). Artisanal mining is sometimes portrayed as a mining branch that is driven by poverty and is gaining economic prominence in various developing nations with abundant natural resources (Kumah, 2022). For governments in Africa, South America,

and other regions, controlling artisanal mining is a difficult task because of the overlapping positive and negative social, economic, and environmental impact (Osman et al., 2022). In Sub-Saharan Africa, artisanal mining has gained popularity for creating jobs and easing burdens for rural residents, particularly young people (Osei et al., 2022). Ghana has abundant natural resources, with gold, diamonds, manganese, and bauxite being the main ones (Minerals Commission, 2014). Large-scale mining together with the mine support service sub-sector employs about 27,000

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people, with an estimated 1,000,000 engaged in the artisanal gold, diamonds, sand winning, quarry and salt industries (Minerals Commission, 2015). The Ghanaian government took steps to regularize artisanal mining due to the recognition of the sector's economic potential and the need to protect financial resources that would otherwise have been lost to illegal mining and related activities (Fearon et al., 2015). Although other industrial minerals including salt, sand, gravel, granite, quartzite, clay, and kaolin are also mined on artisanal basis in Ghana, artisanal mining is typically associated with the extraction of precious minerals, mainly gold and diamonds (Dwomoh, 2012). The informal artisanal mining industry in Ghana has been plagued by serious environmental issues and practices, leading some experts to demand its permanent ban, while others are calling for effective reform (Achina-Obeng and Aram, 2022). Throughout the academic literature, scholars contend that detrimental impact of mining, particularly the loss of agriculturally productive lands, make residents of mining settlements far poorer than they were before (Arah, 2015). As a result of this phenomenon, the discourse around mining's impact on food security has drawn increasing attention and concern, with mining companies, as well as government and non-government organizations, all attempting to address this issue (Baah-Ennum et al., 2015). Artisanal mining in Ghana has evolved from the use of rudimentary equipment such as shovels, pick axes and sluice boards to semi-mechanized operations involving the use equipment such as excavators, bulldozers and washing plants (Minerals Commission, 2015).

The availability and accessibility of food for local communities can be significantly impacted by mining activities, highlighting the close connection between mining and food security. Food security can be understood as a situation when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO, 2002). By 2050, it is projected that there will be over 9 billion people on earth, and we must feed them while preserving the environment and humanity's health (Cole et al., 2018). The development and application of policy interventions that assist asset accumulation for attaining sustainable development could be guided

by empirical knowledge of how involvement in artisanal mining affects livelihood assets, and both the sustainable development goals (SDGs) of eradicating poverty and preserving the environment (Baffour-Kyei et al., 2021).

Although several academic studies have been published over the past decade on the socio-economic and environmental impact of artisanal mining activities on livelihoods (e.g. Arah, 2015; Baah-Ennum et al., 2015; Bansah et al., 2018; Baffour-Kyei et al., 2021; Achina-Obeng and Aram, 2022), there is limited empirical research into how mining communities understand and think about the relationship between artisanal mining and food security. Locals have unique and priceless knowledge of their region, including the cultural traditions, social institutions, and natural resources that influence their way of life. Researchers can better grasp the specific difficulties that communities impacted by artisanal mining activities face by evaluating these local perspectives. This knowledge can aid in the creation of more efficient and long-lasting context-specific initiatives by policymakers and development professionals. Finally, examining residents' perspectives can increase community involvement in the research process and foster ownership of the research findings. By filling in this knowledge vacuum, we can better comprehend the intricate connection between mining and food security.

We filled this gap on the relationship between artisanal mining and food security by investigating the perceptions of mining communities on the impact artisanal mining activities could have on food security by addressing the following specific objectives: (1) to understand how local communities define and conceptualized food security, and (2) to appraise how artisanal mining had impacted agricultural production in the study area. The study is unique in that it assesses the perceived impact of artisanal mining on agricultural production and food security from the point of view of local community members who are directly and indirectly affected by this phenomenon. Again, the focus on a specific district enabled us to explore the nuances between artisanal mining, agricultural output, and food security in context. The study's findings will be useful in informing policies and interventions to promote sustainable mining practices in the study area and other similar jurisdictions.

## IMPACT OF ARTISANAL MINING ON AGRICULTURE AND FOOD SECURITY

The expansion of mining activities may require the conversion of agricultural land into mining areas, affecting the availability of arable land for farming (see: Obodai et al., 2024). Arifeen et al. (2021) in their study on the role of a mine in changing its surroundings, assessed the land use and land cover changes in the vicinity of a coal mine and its adjacent areas in Bangladesh over a 20-year period using remote sensing and GIS techniques. The research findings indicate that settlements grew by more than 50% within the time-frame studied, whereas agricultural land experienced a decrease from 69% to 59% during the same period. They identified land subsidence issues attributed to mining activities, which resulted in the depression of approximately 1.003 km<sup>2</sup> of land as well as the occurrence of cracked houses, affecting around 1,500 households, highlighting the direct impact of mining on the landscape and human settlements in the region. Similarly, Lechner et al. (2016) in their work on the effects of longwall coal mining on agriculture found that subsidence resulting from underground coal extraction alters soil properties, hydrology, and topography, leading to changed farming practices, reduced agricultural productivity, increased erosion or waterlogging risks, and soil compaction or cracking. They maintain that changes in soil and groundwater hydrology, waterlogging, and the emergence of fractured soil zones are the main effects of mining-induced subsidence on agriculture. The authors further emphasize how altered landscapes resulting from subsidence can disrupt traditional farming practices and reduce agricultural productivity. In a more local context, the main problems endangering sustainable agriculture and food security in Ghana and other emerging nations are always related to land use (Yiridomoh, 2021). While some individual benefits are often associated with artisanal mining (Obodai et al., 2024), it has been established in the academic literature that artisanal mining compromises a country's food security, affecting directly and indirectly both the individuals engaged in mining operations and the communities beyond the mining sites (see: Blanco et al., 2023; Obodai et al., 2024).

For example, a global review by Ofori et al. (2020) on the socio-economic and environmental impact of artisanal mining on agriculture and livelihoods revealed a range of potential threats. They identify three primary ways by which artisanal mining negatively impacts agriculture: farm invasions and soil degradation, mercury and water contamination, and the Dutch disease phenomenon. A similar study by Nunoo et al. (2023) found that farmers who used their farmlands for artisanal mining, increased their household food insecurity and their household dietary diversity, and yet they exacerbated their inability to use effective coping mechanisms to fight household food insecurity. In Ghana for instance, 61% of mineral-rich lands are located within the forest agroecological zone, which accounts for 57% of food crop output (Obodai et al., 2024). Given that both of these livelihood activities depend on a limited natural resource such as land and water, it leads to competitiveness and land-related disputes leaving catastrophic impact on natural resources (Suglo et al., 2021). In a recent study by Siaw et al. (2023) on cocoa production and artisanal mining in Ghana found that artisanal miners often used coercive means to acquire farmland for their mining operations. For monetary gain, farmers who would typically work in agriculture are now joining the artisanal miners, which may be progressively displacing farmers from producing food (Amoah-Frimpong, 2013). In a study on the implications of artisanal mining on climate-smart agriculture in Ghana, Yiridomoh (2021) found that adoption of climate-smart agricultural practices is still very challenging because of the artisanal gold mining activities, which have affected well-known agricultural practices, such as the use of manure and household waste, terracing, crop rotation, crop irrigation, and planting of early resistant crop varieties. Overall, the literature shows a compelling array of evidence elucidating the intricate interactions between mining activities, especially artisanal mining, and their far-reaching consequences for agricultural landscapes, land use patterns, and local livelihoods. This reinforces the imbalance between resource extraction and sustainable land management, emphasizing the need for informed decision-making that considers both ecological dynamics and human well-being.

## SUSTAINABLE DEVELOPMENT POLICIES IN THE MINING SECTOR OF GHANA

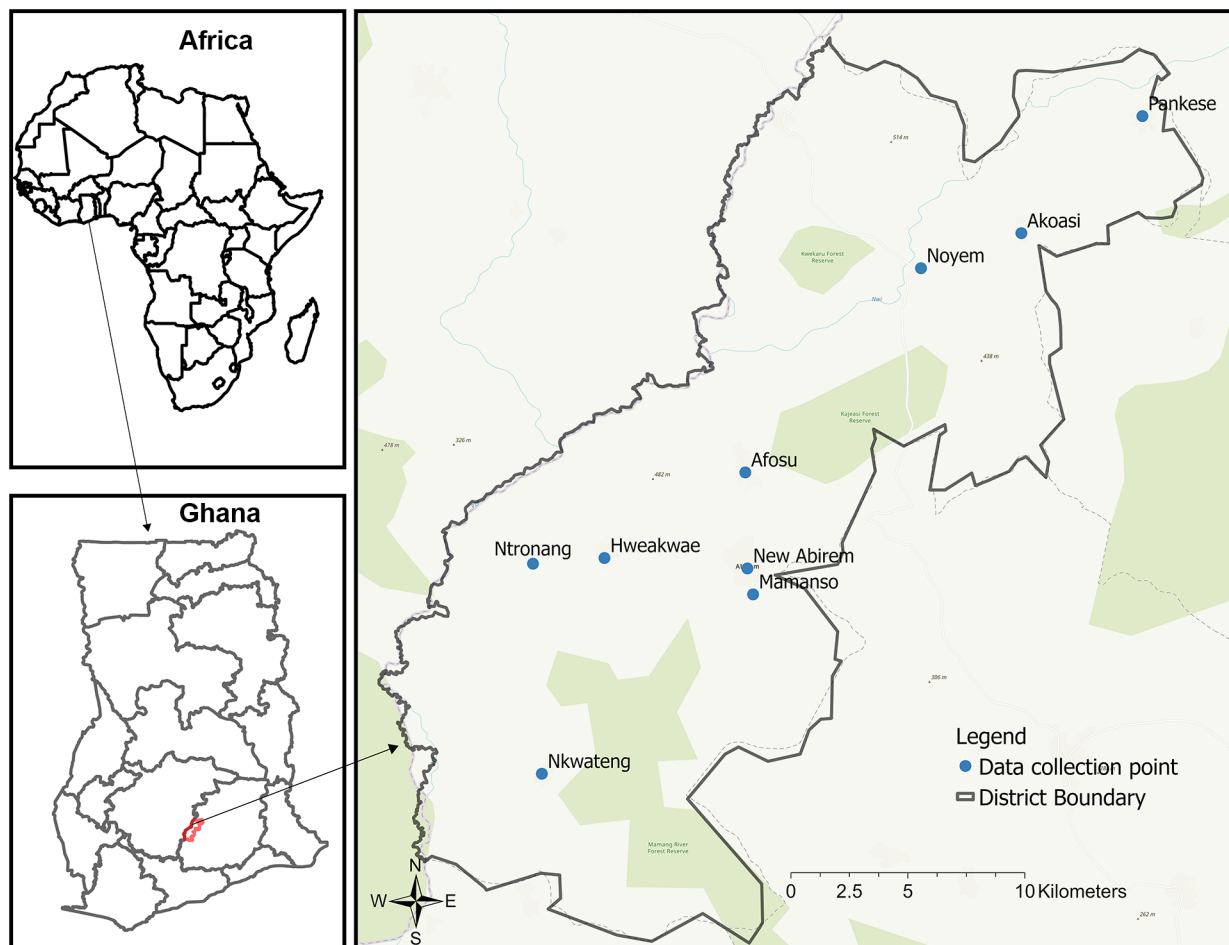
As one of Africa's leading producers of mineral resources such as gold, Ghana has introduced and implemented several policies and regulations to promote sustainable mining. The Minerals and Mining Act (Act 703), first introduced in 2006 and subsequently amended in 2010, 2015, and 2019, serves as the principal law regulating the mining industry in Ghana (Tuokuu et al., 2018; Asumda et al., 2024). Although this Act was enacted to promote sustainable development in the mining sector, it has faced criticism for not fully addressing sustainability challenges. According to Asumda et al. (2024), the Act does not align with the best international practices for sustainable mining, particularly in areas such as environmental protection. Issues such as water pollution, deforestation, air pollution, land degradation, mercury contamination, increased poverty, displacement of communities, and unregulated artisanal mining activities remain prevalent. In addition to the Minerals and Mining Act, the government of Ghana introduced the Minerals and Mining Policy of Ghana, 2014 to regulate and enhance the efficiency of artisanal and small-scale mining operations (Mabe, 2023). The three main components of this policy include:

- the establishment of district offices to provide mining extension services in order to promote sustainable artisanal and small-scale mining operations in Ghana;
- conducting geological demarcation to identify areas suitable for small-scale mining and assist in the acquisition of small-scale mining licenses;
- the provision of financial assistance support to artisanal and small-scale miners to improve their mining operations. Despite the introduction and implementation of these policies, significant challenges remain in achieving truly sustainable mining practices in Ghana. There is the need to enforce existing policies and also to promote continuous improvement and adaptation of these policies in order to ensure that the mining sector contributes positively to Ghana's sustainable development goals.

## MATERIALS AND METHODS

### Study area

In 1987, as part of the government's decentralization initiative to encourage efficient decentralized governance and expedite region's development, the Birim North District – with New Abirem as its capital – was separated from the former Birim District Council (Birim North District, 2018a). The district is located in the eastern region of Ghana with an area of about 572.7 km and a population size of about 82,669, representing 2.8% of the regional population. Males form about 41,343 and females 41,326 of the total population (Ghana Statistical Service, 2021). The Birim North is bordered to the north by Kwahu West Municipality, to the south by Akyemansa District, to the east by Atiwa East District and Kwaebibirem Municipality, and to the west by Asante Akyem South and Adansi South (Ghana Statistical Service, 2024). Agriculture is the backbone of the district economy. Approximately 73.5 percent of the district's workforce is employed in some sort of agricultural operation (Ghana Statistical Service, 2013). Most of the district's landmass covers the region's primary mineral deposit area, which supports extensive mineral prospecting and exploration by numerous companies as well as artisanal gold and diamond mining operations (Kwang et al., 2014). The study area's geology primarily features Proterozoic rocks from the Upper and Lower Birimian and Tarkwaian systems (Appoh et al., 2011). The Upper Birimian rocks are made up of black slates, sericite schist and phyllites, subordinate grey, sandy phyllites and greywackes, while the lower Birimian rocks consist of black phyllites, metasilstones, metagreywackes, tuffaceous sediments, tuffs and hornstones (Mayeem, 2016). One of the main minerals extracted in Birim North is gold (Mayeem, 2016). The alluvial gold found in the district is extracted from the eroded and weathered Birimian rocks, Tarkwaian rocks, as well as the mineralized eroded granites where the River Pra flows (Birim North District, 2018b). Since large-scale mining companies such as Newmont Ghana Limited started operating in and around the district, artisanal mining operations have been on the rise (Yakovleva, 2007). Artisanal mining often referred to as "galamsey" has been on the rise in the 9 communities



**Fig. 1.** Map of study area and data collection points (source: Authors' own elaboration)

that were selected for this study: Pankese, Akoasi, Noyem, Afosu, New Abirim, Mamanso, Hweakwae, Ntronang, and Nkwateng.

### Study design and data collection

This study adopted a mixed methods research design which allowed for the combination of qualitative and quantitative elements (Bazeley, 2024). This approach facilitated an in-depth examination of people's perspectives and experiences, revealing important details about the intricate and complex ways that mining operations affect food security in the studied area. We began with a survey, and followed with 9 focus group discussions, one for each of the nine communities, for exploratory purposes (Creswell, 2009); (see: a summary of participants in Tables 1 and 2). To guarantee representation

from a broad range of demographic and occupational categories within the artisanal mining communities such as miners, farmers, and community leaders, simple random sampling was utilized (Bhattacharjee, 2012). Participants were recruited based on their membership in the sampled communities and their willingness to participate in the study. Informed consent was obtained from all participants before the survey or discussions began. Recordings were made with the consent of the participants for the focus group discussions to accurately capture their opinions. This approach helped maintain the integrity of the data and ensure that the findings were based on the participants' actual experiences and perspectives. Direct quotes from participants during the focus group discussions are emphasized in the results section. These direct quotes serve to provide authentic



voices and personal experiences, enriching the findings and lending credibility to the study’s conclusions. All the data collected from the questionnaire was coded into and processed in IBM SPSS 27 software. Following verbatim transcription of the recordings from the focus group discussions, thematic analysis was performed to extract and organize overarching themes, structures, and interpretations from the data in Nvivo 14 software. This enabled us to recognize and comprehend collective meanings and experiences (Braun and Clark, 2012).

### Spatial analysis

The locations of the respondents used in this study were recorded using Kobo Collect open-source android application (<https://www.kobotoolbox.org/#home>), which made it possible to apply spatial analysis on the re-

sponses collected. The locational data of respondents were joined with coded thematic data from the field questionnaires. Using ArcGIS Pro software, geographically weighted regression and hotspots analysis were performed to geographically understand the trends and spatial distributions of the perception regarding the impact of artisanal mining on food security. First, the geographically weighted regression was performed, after which the hotspots analysis was applied to the predicted values from the geographically weighted regression analysis. The geographic weighted regression analysis was preferred because it could spatially map sample locations with no impact, weak impact, and strong impact on the perception of artisanal mining on food security. Geographically weighted regression analysis is mostly used in social sciences (Nazarpour et al., 2022).

**Table 1.** Respondents for the focus group discussions (source: Authors’ own elaboration)

Community	Sample size	Stakeholder group represented	Gender of respondents	
			Male	Female
Pankese (FGD 1)	5	Household heads	3	2
Akoasi (FGD 2)	5		4	1
Noyem (FGD 3)	5		3	2
Afosu (FGD 4)	5	Opinion leaders	3	2
Abirim (FGD 5)	5		4	1
Mamanso (FGD 6)	5		3	2
Hweakwae (FGD 7)	5	Community leaders	5	0
Ntronang (FGD 8)	5		4	1
Nkwateng (FGD 9)	5		3	2
<b>Total</b>	<b>45</b>		<b>32</b>	<b>13</b>

**Table 2.** Respondents to the survey (source: Authors’ own elaboration)

Level of education		Non-formal education	‘O’ Level, ‘A’ Level /SSS	MSLC/JHS	Diploma	Graduate	Total
Age	18–28 years	3	16	9	8	13	49
	29–39 years	7	8	5	2	11	33
	40–59 years	7	7	18	2	4	38
	60 and above	0	1	0	0	0	1
<b>Total</b>		<b>17</b>	<b>32</b>	<b>32</b>	<b>12</b>	<b>28</b>	<b>121</b>

## RESULTS

### Perceived Impact of Artisanal Mining on Local Agriculture and Food Security

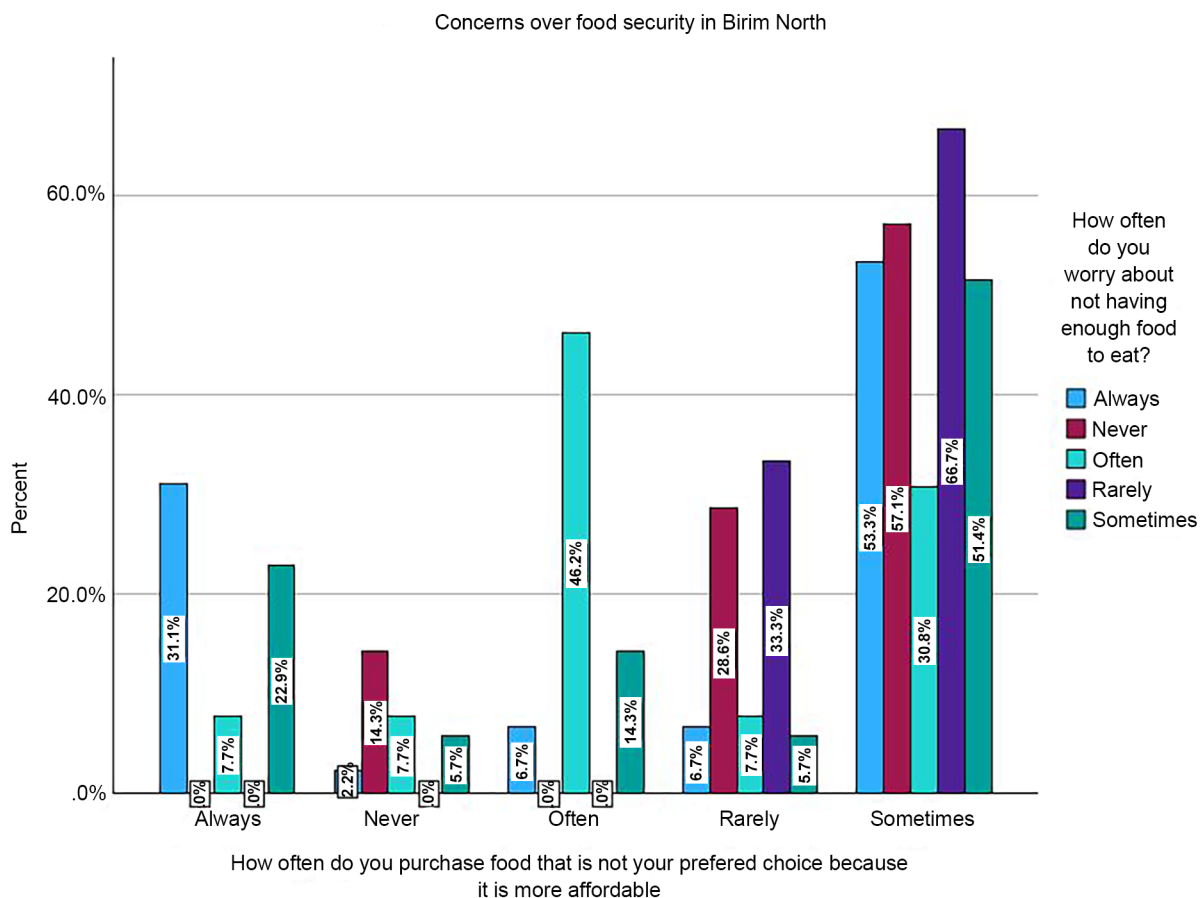
The findings are grouped in accordance with the primary goals of the study: to understand how local communities define and conceptualized food security as well as appraise how artisanal mining had impacted agricultural production in the study area.

The responses to the questionnaire revealed a great amount of stress and anxiety on the part of the respondents in relation to their access to food. When asked how frequently they worried about not having enough food to eat and made compromises on the food they purchased, 31.1% revealed that this was a problem that always crossed their minds, 14.3% indicated that this was not a problem they faced, 46.2% indicated

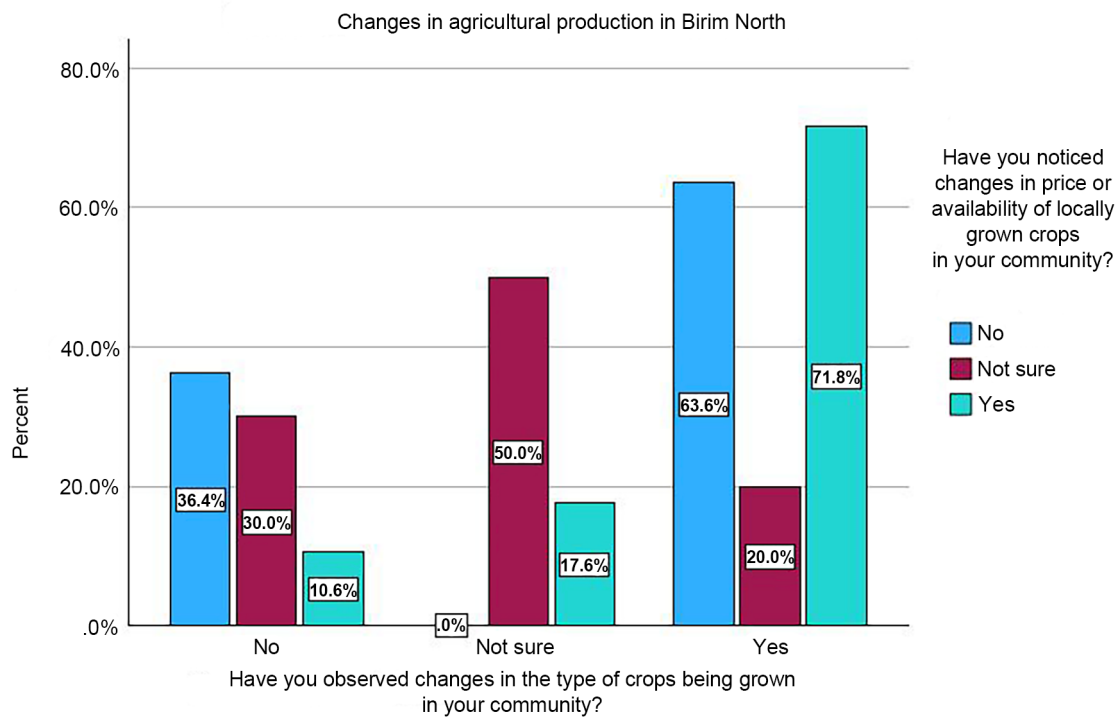
they often faced this challenge, 33.3% indicated that they rarely faced this challenge, while 51.4% indicated that they sometimes faced this issue (see: Figure 2).

On our second objective to understand how artisanal mining had affected agricultural production in the study area, respondents were quick to note a change in the types of crops being grown locally as well as a change in the price and availability of locally grown crops. For example, 71% responded “Yes” to these changes, 50% responded “Not sure” and 36.4% responded “No” (see: Figure 3).

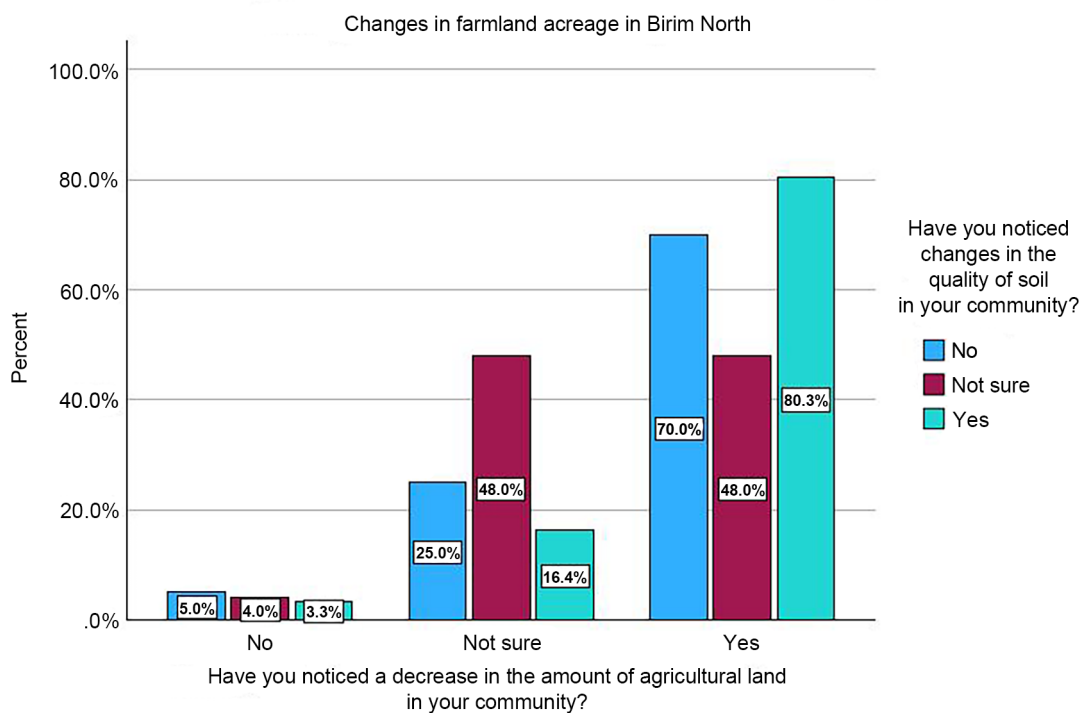
Respondents from the survey also acknowledged the decrease in farmland acreage. Specifically, 70% indicated “Yes” to noticing a change in the soil quality and a decrease in the amount of agricultural land, 48% indicated “Not sure”, while 5% indicated “No” (see: Figure 4).



**Fig. 2.** Concerns over food security in Birim North (source: Authors’ own elaboration)



**Fig. 3.** Changes in agricultural production in Birim North (source: Authors' own elaboration)



**Fig. 4.** Changes in farmland acreage in Birim North (source: Authors' own elaboration)

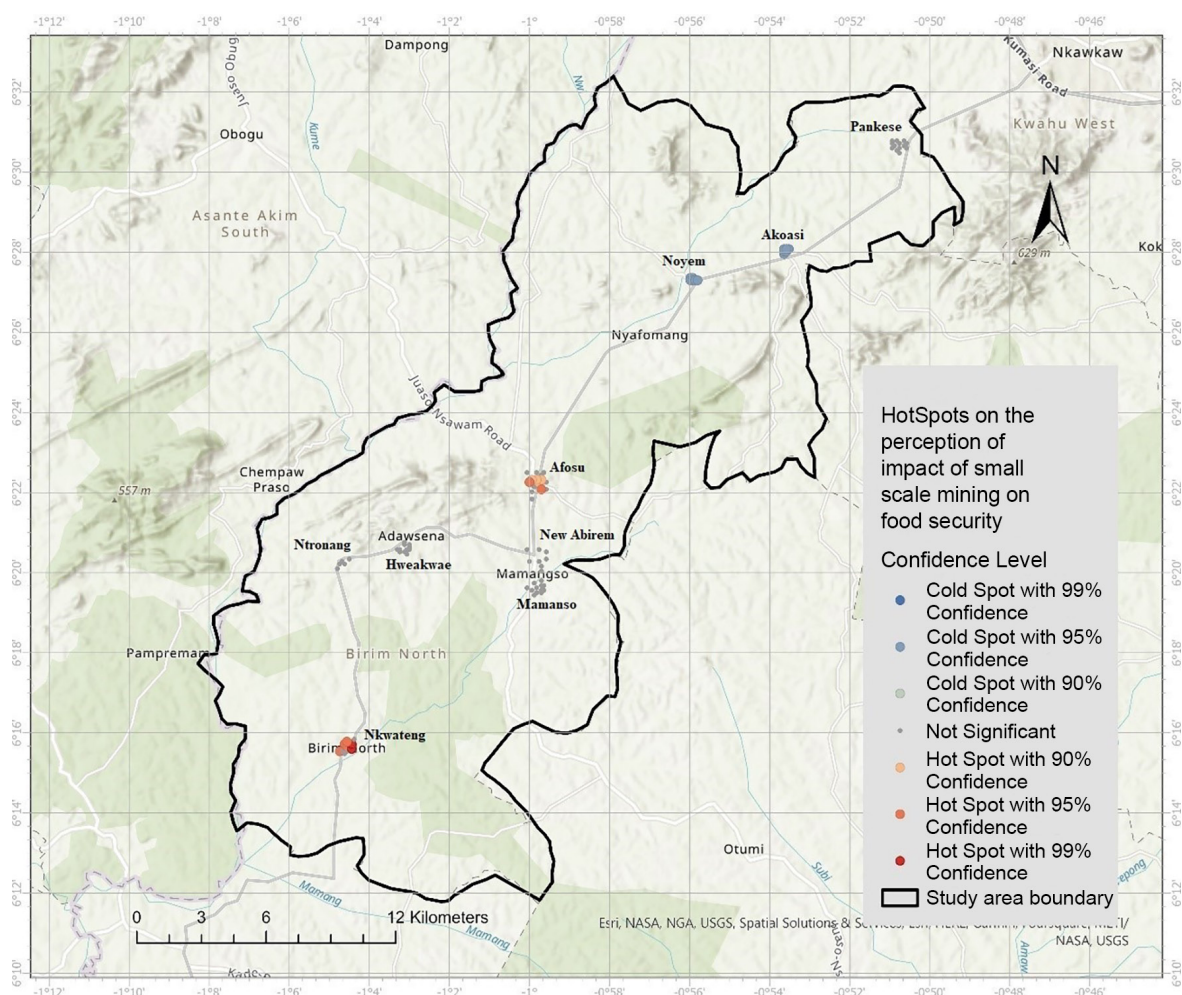


In response to a question about experiences or stories related to food availability in the community from our focus group discussion, one respondent remarked (FGD 7): “Food has become very expensive in my community for several reasons. The major reason is the impact of artisanal mining. You sometimes find it difficult to get food to buy because of low agricultural production.” Another boldly asserted (FDG 7): “A community like Hweakwae is going through a lot when it comes to food insecurity as compared to previous years when no mining activities were going on here. Now food is expensive, and it scares us all the time. We must travel to nearby communities to get food. We have not experienced such things before.” Respondents generally believed that mining in their

community was responsible for the decrease in agricultural output. When asked about their opinion on the role of artisanal mining in reducing the amount of agricultural produce, one respondent expressed the following sentiments (FDG 5): “Due to mining in my community, the soil cannot provide us with much food. The soil has lost its content. Moreover, the food is now expensive in the community. You cannot even use 5 cedis to buy food.”

### Spatial distribution of the perceived impact of artisanal mining

The spatial distribution of the perceived impact of artisanal mining on food security is illustrated in Figure 5. Only two of the communities expressed a high lev-



**Fig. 5.** Hot spots on the perception of the impact of small-scale mining on food security (source: Authors’ own elaboration)

el of the impact of artisanal mining on food security: Nkwateng and Afosu. From the spatial distribution, these communities indicated serious concerns about the threat of food insecurity. Communities with low impact of artisanal mining on food security included Noyem, Pankese and Akoasi. Although artisanal mining activities are present in these communities, their presence did not have an adverse effect on the production and availability of food.

## DISCUSSION

The study sought to understand the impact of artisanal mining on agricultural production and food security in the Birim North District of Ghana from the point of view of local community members. With regard to our objective to understand how local communities define and conceptualized food security, results from the survey show major concerns and issues linked to food security among the communities that were studied. Many respondents were concerned about their inability to put food on the table, expressing a high degree of anxiety (Figure 2). This hints at a persistent and continuous sense of unease around the availability of food. The phenomenon suggests that people are compelled to make concessions on the foods they select to satisfy their fundamental dietary requirements within the constraints of their financial resources. The perspectives shared by the respondents in this study highlight the effects that food insecurity has on people's everyday lives. The difficult decisions that emerge because of food insecurity, such as deciding between food, rent, bills, and transportation, further aggravate the difficulties that individuals and households experience. A study by Wegenast and Beck (2020) confirm the impact of mining on diet diversity among locals in mining communities. They affirm the widespread problem of food insecurity and the challenging choices that individuals must make to satisfy their fundamental requirements, such as providing for their households, and their financial obligations.

The responses from the survey to the second objective (i.e. to appraise how artisanal mining had impacted agricultural production in the study area) indicate that a significant portion of the community perceives artisanal mining as having altered the local agricultural production. With 71% affirming changes in crop types,

prices, and availability, the data suggests that mining activities may be reshaping what can feasibly be grown and the economic dynamics of locally sourced food. However, the varied responses, 50% being unsure and 36.4% disagreeing, also imply a degree of uncertainty or disagreement about these kinds of impact within the community (Figure 3). The variation could reflect differences in individual experiences, in access to farmland, or in the extent of mining's impact on specific areas. These findings suggest that while many residents noticed a shift in agriculture tied to mining, there is a complex and perhaps uneven influence on local food production across the studied area. 70% of our survey respondents observed both a decline in soil quality and a reduction in the acreage of agricultural land, which they attribute to the effects of artisanal mining (Figure 4). This perception suggests that mining may be degrading soil health and reducing the land available for farming, likely impacting local agricultural productivity. However, the data also shows some uncertainty, with 48% of respondents indicating they are unsure of these effects, and 5% not perceiving any such changes. This range of responses may reflect varying levels of exposure to all kinds of mining impact or differences in farming experience among community members, highlighting a prevalent concern about soil degradation and farmland reduction, indicating a potential threat to sustainable agriculture in the area. The loss of agricultural land was reported by Danyo and Osei-Bonsu (2016) as the main impact of artisanal mining on Ghanaian mining communities. Haruna et al. (2022) also indicated a similar finding by describing mining and agriculture as intertwined because of the impact of mining on agricultural productivity. All these variables, taken together, add to the complicated problems of food insecurity that mining communities are faced with. The negative impact of artisanal mining has recently come to the forefront as a significant factor that exacerbates food insecurity and has negatively affected many people's health and well-being, especially women and children (Obodai et al., 2024).

The focus group responses highlight how artisanal mining has not only driven up food prices and reduced agricultural productivity but also forced residents to travel to nearby towns to purchase food. This shift reflects a significant disruption to local food systems, with community members now facing the additional

burden of travel for basic necessities, a scenario that was reportedly uncommon before mining activities intensified. The need to source food from outside communities amplifies the economic and logistical challenges faced by residents, increasing both the time and cost associated with food access. This situation illustrates the broader, often hidden impact of mining on community livelihoods and food security, as it transforms once self-sustaining communities into food-insecure areas dependent on external resources.

Based on our geographic information systems (GIS) analysis of the spatial distribution of perceptions regarding how artisanal mining activities impact food security, larger towns with higher populations, such as Afosu near the Akyem Newmont Mine, have higher perception ratings of food insecurity. Conversely, communities located farther from the Akyem Newmont Mine reported little to no significant perceived impact on food security from artisanal mining (Figure 5). This suggests that the presence of a large-scale mining company might influence the decision of the locals to engage in artisanal mining activities.

These results from this study indicate the intricate web of interrelationships that exists among environmental factors, economic dynamics, and food security. For instance, the impact that mining activities have on agricultural land and the quality of the soil is an indication of the potential trade-offs that might occur between economic development and the sustainable use of land. The difficulties that mining communities must deal with are made even more complex due to the rising cost of food, fewer locally farmed crops, and falling income of farmers. The findings highlight the necessity for comprehensive methods that address the environmental, economic, and social elements of food security to maintain the well-being and resilience of mining communities. It also highlights the necessity of sustainable land use methods, environmental conservation, and support for local farmers to increase agricultural output and ensure access to food that is both inexpensive and healthy.

Despite this study's contribution to understanding the impact of artisanal mining on food security, there are potential weaknesses as well as areas for further research that should be acknowledged. This study did not capture data over past years to assess the changes in food security levels. Future research could therefore

conduct longitudinal studies to track changes in food security status over time. This would enable researchers to assess the effectiveness of interventions and policies implemented in order to address food insecurity, and to identify factors that contribute to changes in food availability.

## CONCLUSION

This study analyzed the complex interactions that exist between artisanal mining, agricultural productivity, and food security in the Birim North District. Emerging as key problems were the loss of agricultural acreage, the condition of the soil, the change in the types of crops grown locally, the availability, variety, as well as the cost of locally grown products. It was determined that mining had major repercussions, and as a result, community members were forced to travel to neighboring villages to obtain food because the supply of food in their own community had decreased. It is important for the government to put into action policies that will reduce the detrimental impact that artisanal mining has on agricultural land, the quality of the soil, and water resources. This can be accomplished by instituting environmentally responsible mining techniques, enforcing strict environmental rules, and engaging in land reclamation works. In addition to this, it is essential to provide local farmers with access to resources, information, and technology that boosts agricultural output. That would involve supporting the development of local markets for agricultural products, promoting the use of varied agricultural systems, as well as strengthening the infrastructure of irrigation systems.

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## **WPLYW GÓRNICTWA RZEMIEŚLNICZEGO NA PRODUKCJĘ ROLNĄ I BEZPIECZEŃSTWO ŻYWNOŚCIOWE W DYSTRYKCIE BIRIM NORTH W GHANIE**

### **ABSTRAKT**

#### **Cel pracy**

Działalność górnicza może negatywnie wpływać na możliwości zdobywania przez ludność wartościowej żywności. W ramach niniejszego badania poddano analizie złożony związek między górnictwem rzemieślniczym, produkcją rolną a bezpieczeństwem żywnościowym w dystrykcie Birim North w Ghanie.

#### **Materiał i metody**

W badaniu wykorzystano ankiety, dyskusje w grupach fokusowych (FGD) oraz analizę GIS, aby zrozumieć poglądy i doświadczenia mieszkańców społeczności górniczych oraz dowiedzieć się, jak postrzegają i rozumieją bezpieczeństwo żywnościowe.

#### **Wyniki i wnioski**

Analiza GIS pozwoliła zidentyfikować mieszkańców Afosu i Ntronang jako społeczności, które odczuwają znaczący wpływ górnictwa na bezpieczeństwo żywnościowe, ponieważ te miejscowości znajdują się w pobliżu dużej firmy górniczej. Wyniki ankiety i dyskusji w grupach fokusowych świadczą o tym, że społeczności objęte badaniem były zaniepokojone kwestią dostępności pożywienia, zwracały uwagę na zmniejszenie powierzchni gruntów rolnych i urodzajnej gleby. Respondenci wyrażali również obawy dotyczące zakresu, ceny i dostępności lokalnie uprawianych roślin. Wyniki te pokazują, jak ważne jest szybkie działanie w różnych obszarach w celu zredukowania negatywnych skutków górnictwa rzemieślniczego na produkcję rolną. W tym przypadku niezwykle istotne jest stosowanie nieinwazyjnych metod górniczych na badanym obszarze i w podobnych miejscach oraz priorytetowe traktowanie zrównoważonego zarządzania gruntami.

**Słowa kluczowe:** bezpieczeństwo żywnościowe, nielegalne górnictwo, skutki górnictwa, rolnictwo, GIS