

Livelihood transformation in Pangi Village: Navigating the socio-economic dynamics of the shift from agriculture to gold mining

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Abstract

This study examines the socio-economic transformation in Pangi Village, Gorontalo, Indonesia, marked by a significant shift from agriculture to artisanal and small-scale gold mining (ASGM), driven primarily by declining agricultural productivity and increasing economic uncertainty. This study adopts a qualitative research approach to examine the socio-economic and environmental implications of the livelihood transition. Data were collected through in-depth interviews with farmers, miners, village officials, and community leaders, complemented by field observations in both agricultural and mining areas. The data were analyzed thematically to capture community perceptions, lived experiences, and local responses to the changing rural economic landscape. The findings indicate that while ASGM offers higher income potential than agriculture, it also generates significant social and environmental consequences. Social relations within the village have become increasingly fragmented, particularly between households engaged in mining activities and those remaining in the agricultural sector. In addition, mining activities have contributed to land degradation and water pollution, further threatening the sustainability of agricultural practices. Government initiatives aimed at protecting agricultural land and revitalizing the farming sector have not yet achieved optimal outcomes, as they have failed to provide rapid and tangible improvements in farmers' welfare. As a result, despite awareness of the risks associated with mining, many residents continue to abandon agriculture in favour of ASGM. The findings highlight that the livelihood transition is driven by persistent economic pressures and limited agricultural viability, while simultaneously generating social fragmentation and environmental degradation. This study contributes to a deeper understanding of rural livelihood transformations by revealing how economic vulnerability shapes community responses and policy outcomes. These results underscore the need for integrated policies that strengthen agricultural competitiveness, enhance farmer empowerment, and balance economic development with environmental sustainability to ensure long-term rural welfare.

Introduction

The transition from traditional agriculture to artisanal and small-scale gold mining (ASGM) is one of the core tenets of the modernization school of thought (Rostow, 1960, as cited in Omonijo, 2026). This transition has emerged as a transformative socio-economic phenomenon in rural developing regions. In regions such as Pangi

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Village in Gorontalo, Indonesia, this transition is particularly evident and is primarily driven by economic incentives. Specifically, rising gold prices have created economic opportunities, leading local communities to adopt mining to improve their wellbeing (Adranyi et al., 2024). Similarly, Baddianaah et al. (2021) observe that in Ghana's Wa East District, artisanal mining contributes more to household income than food crop farming, with mining revenues often serving to finance small-scale agriculture. Conversely, these mining activities have degraded agricultural land, posing a threat to the long-term sustainability of the sector.

The major negative impacts of land degradation include the loss of nutrients, reduced surface water flow (Iqbal et al., 2026), and infrastructure damage due to heavy vehicle traffic (Golar et al., 2019). While the sector can create employment opportunities, if mining operations are solely driven by financial profit without regard for environmental consequences, regions will be forced to contend with severe issues such as air pollution and ecological damage (Siregar et al., 2021).

These environmental challenges exacerbate the strain on agricultural lands and threaten the sustainability of rural livelihoods, a dynamic that Omonijo et al. (2017) regard as a significant driver of the insecurity prevalent in developing countries. Consequently, balancing the economic benefits of small-scale mining with environmental protection is crucial for ensuring long-term socio-economic stability in these regions.

According to Alam (2026), a shift in livelihoods from agriculture to non-agricultural sectors does not automatically yield sustainable well-being; in the absence of robust institutional support, such transitions may instead exacerbate local communities' social, economic, and ecological vulnerabilities.

For many smallholder farmers in rural developing regions, artisanal gold mining is increasingly perceived as a more profitable economic opportunity when agricultural income becomes insufficient. In Nigeria, Okegbade et al. (2021) reported a significant decline in rice production, illustrating this trend. Similarly, research by Ma'mun (2016) in Bombana, Southeast Sulawesi, highlighted that declining agricultural productivity, partly due to prolonged drought, led many farmers to abandon their farmland in favour of artisanal gold mining to seek immediate financial returns, despite having limited experience. Pokorny (2019) reported comparable findings, noting that while artisanal gold mining creates job opportunities and generates income for local households, its impact on the agricultural sector is often detrimental, leading to greater long-term economic strain.

Similar patterns have been observed in other contexts where the growth of small-scale gold mining alters household economic decisions: emerging mining sites attract labour away from farming, resulting in reduced agricultural production but increased household consumption and welfare in the short-to-medium term (Poignant, 2023). Additionally, studies indicate that artisanal mining may offer higher income potential for rural households compared to traditional agriculture, thereby incentivizing labour reallocation toward mining activities (Mabe et al., 2023), while broader reviews underscore that low agricultural income is a key driver of livelihood diversification into non-farm sectors (Kumar & Khunger, 2025), such as ASM (Schwartz, 2021). This evidence reinforces the view that economic motivations related to income inadequacy in farming play a central role in driving shifts toward artisanal mining, even as this transition carries significant socio-environmental implications.

This trend is further exacerbated by broader structural and policy factors. Many studies show that structural adjustment programmes and the reduction of government subsidies in the agricultural sector have reduced the community's dependence on farming and contributed to increased unemployment (Banchirigah & Hilson, 2010; Cartier & Bürge, 2011; Hilson & Potter, 2005; Peters & Richards, 2011; Unruh, 2005). As a result, many workers, including new graduates and displaced workers from large-scale mining operations, have turned to small-scale gold mining as an alternative livelihood in rural areas (Banchirigah & Hilson, 2010; Hilson & Potter, 2005). In addition to these broader structural changes, small-scale farmers in some regions face specific constraints that hinder agricultural productivity and sustainability. Factors such as insecure long-term land tenure, low levels of mechanization, limited access to capital, and poor infrastructure have impeded agricultural output (Cartier & Bürge, 2011; Peters & Richards, 2011; Unruh, 2005). These conditions have made it difficult for many farmers to rely on agriculture as a sufficient and profitable source of income (Cartier & Bürge, 2011).

Consequently, some farmers, particularly the younger generation, have shifted to artisanal gold mining as a seasonal job or additional income, considering it more profitable and capable of providing faster returns than farming (Cartier & Bürge, 2011; Fanthorpe & Maconachie, 2010). This shift is also influenced by the urgent need to meet family economic needs amidst uncertainty in the agricultural sector (Fanthorpe & Maconachie, 2010). In this context, development policy should prioritize strengthening community-based mechanisms and institutions to sustain the agricultural sector while advancing social justice in rural areas (Widiono et al., 2025).

Strengthened local institutions can enhance farmers' collective capacity to secure land and resource rights, coordinate access to agricultural inputs and credit, and negotiate more effectively with external actors, thereby reducing the structural pressures that push households away from farming. Moreover, community-based governance can help align rural development initiatives with local needs and ensure that the benefits of economic change are distributed more equitably, rather than deepening vulnerability and inequality.

The transition from agriculture to artisanal and small-scale gold mining (ASGM) has profound implications for the social fabric of rural communities. Agriculture, despite being economically challenging in recent years, has historically played an integral role in fostering social cohesion and community resilience. However, the shift to mining has altered social dynamics, with some individuals benefiting financially, while others are left marginalized or exposed to unstable incomes (Herdiyanti et al., 2025). This uneven distribution of wealth contributes to social fragmentation, eroding the sense of community solidarity that was once nurtured through collective agricultural work. Moreover, the migration of younger farmers into mining exacerbates the decline in the agricultural workforce, creating a generational divide within rural communities. These social shifts are further compounded by the lack of robust institutional frameworks to manage the transition effectively. Government policies often fail to address the complexities of balancing economic development with environmental sustainability (Herdiyanti et al., 2025).

Previous research has mostly focused on environmental and health impacts, with some also addressing the short-term economic benefits of ASGM—such as increased household incomes and reduced poverty. However, there is limited research exploring the long-term social and economic consequences of the shift from agriculture to non-agricultural livelihoods (Hilson, 2016; Hilson et al., 2018; Mimba et al., 2023; World Bank, 2019; Stokes-Walters et al., 2021). Specifically, the effects on social structures, food security, and agricultural sustainability remain underexplored (Baddianaah et al., 2021; Adranyi et al., 2024). There is a notable gap in understanding how government policies designed to protect agricultural land can be integrated with the growing demand for mining as a livelihood. Existing literature emphasizes the need for more comprehensive, cross-sectoral policies that balance the economic demands of mining with the protection of agricultural land (Prescott et al., 2020; Herdiyanti et al., 2025) but little attention is given to how such policies can be effectively enforced and adapted to local contexts.

This gap highlights the necessity for a study that examines not only the immediate economic impacts of ASGM but also the broader implications for rural communities in developing countries, particularly regarding the role of government policies in mitigating environmental and social risks. This research, therefore, aims to explore the socio-economic transition in Pangi Village from agriculture to gold mining, assessing the consequences of this shift on local livelihoods and community structures. The study will also evaluate the effectiveness of government policies designed to sustain the agricultural sector amidst the rise of mining as a dominant livelihood. By focusing on Pangi Village, this research offers a valuable case study that will contribute to the broader discussion on rural livelihood transitions in developing countries.

The novelty of this study lies in its comprehensive approach, integrating an analysis of the socio-economic dynamics of mining transitions with an evaluation of government policy effectiveness. Unlike much of the existing literature, which primarily focuses on the economic and environmental aspects of ASGM, this study will examine the role of local governance, social norms, and community expectations in shaping the outcomes of the transition from agriculture to mining.

In summary, this study seeks to fill a significant gap in the literature by providing a detailed analysis of the socio-economic impacts of the transition from agriculture to gold mining in Pangi Village. The research will offer critical insights into the effectiveness of government policies in sustaining agriculture while managing the rapid growth of ASGM. The findings will contribute to the broader discourse on rural development and environmental sustainability, offering practical recommendations for policymakers who aim to address the challenges posed by livelihood transitions in rural communities. Through this study, we hope to provide a clearer understanding of how economic development and environmental sustainability can be harmonized in rural communities facing similar socio-economic transformations.

Method

The study area

This study was conducted in Pangi Village, located in the Suwawa Timur Subdistrict, Bone Bolango Regency, Indonesia, from July to August 2025. The location was deliberately chosen due to its proximity to active mining areas, providing relevant context for understanding the socio-economic transition occurring within the local

community. A significant portion of the population in Pangi Village has shifted from agricultural livelihoods to gold mining. Therefore, this village was selected as an appropriate site to explore the impacts of this livelihood change.

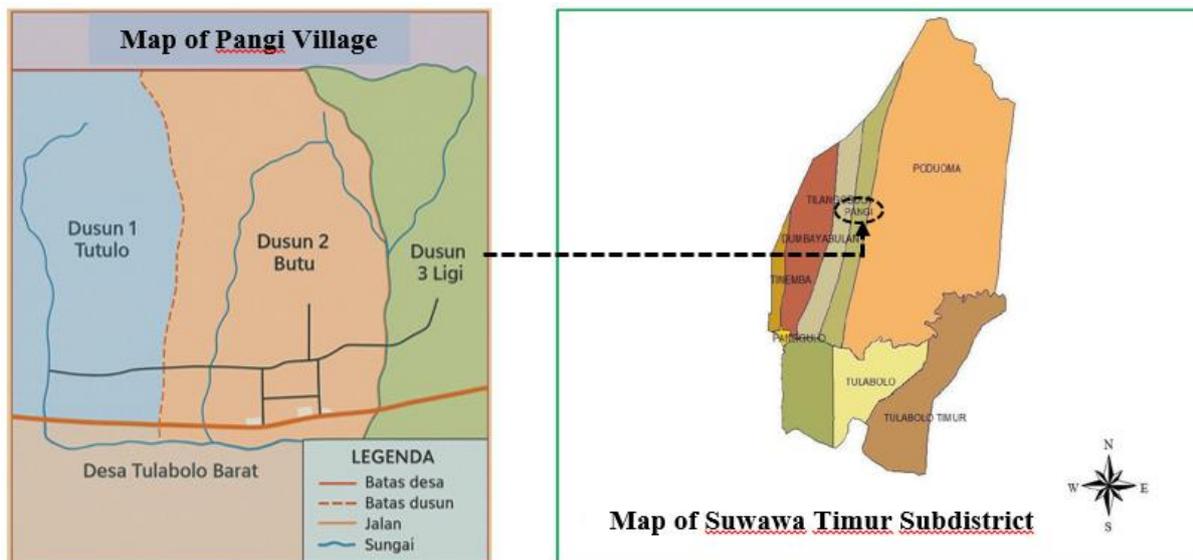


Figure 1. Location study map

Pangi Village is one of the nine villages located in the East Suwawa Subdistrict. Covering an area of 2,100 hectares, the village is known for its abundant water resources, with settlements situated along the banks of the Bone River. Geographically, Pangi Village is situated in the central rural area of the East Suwawa Subdistrict, bordered by Gunung Duano to the north, Poduwoma Village to the east, the Bone River to the south, and Tilangobula Village to the west.

Research method

This study employs a qualitative research method with a descriptive approach. A qualitative method is chosen due to the empirical realities that need to be explored in the field, and this approach strongly encourages an immersive engagement with the subjects being studied. Additionally, the characteristics of qualitative research include its naturalistic nature; descriptive data; inductive data analysis; and the centrality of meaning in the research process (Bogdan & Biklen, 1982; Bryman, 2004). Furthermore, this approach prioritizes understanding social phenomena in a wider context, with a specific focus on individual and group perspectives (Creswell & Clark, 2018, as cited in Omonijo, 2025).

The qualitative method with a descriptive approach was chosen for this study to allow a deeper understanding of the socio-economic dynamics in Pangi Village, particularly the livelihood transition from farming to gold mining. This method is well-suited to explore the complex, contextual, and lived experiences of the community (Neuman, 2014, as cited in Wiroto et al., 2023). Given the local nature of the research topic, the descriptive approach facilitates a comprehensive analysis of the underlying factors influencing the transition, including social, economic, and environmental aspects.

Moreover, the qualitative approach enables the researcher to immerse themselves in the community's daily life, providing a more nuanced and detailed understanding of the subject matter. This approach is especially valuable in studying processes such as livelihood transitions, which are deeply embedded in the local context and require a sensitive, in-depth exploration of participants' perspectives and experiences.

Data collection methods

Data collection in this study was conducted through in-depth interviews and direct observations in Pangi Village, Suwawa Timur District. Interviews were carried out with various informants who possess knowledge and experience related to the shift of livelihoods from agriculture to gold mining, such as village officials, community leaders, farmers, and gold miners. The interview technique was chosen because it allows the researcher to explore detailed and nuanced information regarding perceptions, experiences, and socio-economic dynamics at the community level. In addition, field observations were conducted to capture the social and environmental conditions directly, ensuring that the data were not only derived from the informants' narratives but also from real situations observed in the research setting. This combination of methods was

considered appropriate to achieve the research objective of revealing the complexity of livelihood transition, which cannot be fully explained by quantitative data alone. A total of 10 key informants were selected using a purposive sampling technique. This method according to [Omonijo, \(2026\)](#) ensured that initial informants recruited future subjects from among their acquaintances, allowing for the identification of individuals with specific knowledge relevant to the study.

Data analysis

The qualitative data analysis was carried out by engaging directly with the data, organizing, synthesizing, and identifying relevant information. Through this process, the researcher sought to uncover patterns, meanings, and significant findings that emerged from the data.

More specifically, the qualitative data analysis was conducted in three stages. First, all information from the field was systematically recorded to produce field notes, which were then coded to ensure the traceability of the data sources. Second, the data were compiled, categorized, classified, and synthesized to achieve a more structured form suitable for analysis. Third, reasoning was applied to interpret the categories, identify patterns and relationships among the data, and derive general findings aligned with the research focus.

The research procedure began with the preparatory phase, which included a comprehensive literature review, the development of research instruments, and logistical arrangements for field data collection. The instruments used consisted of in-depth interview guides, participatory observation, and documentation to collect relevant data from the community of Pangli Village. At this stage, the researcher also identified the community members to be interviewed and determined the necessary data sources, such as government policies and local economic reports.

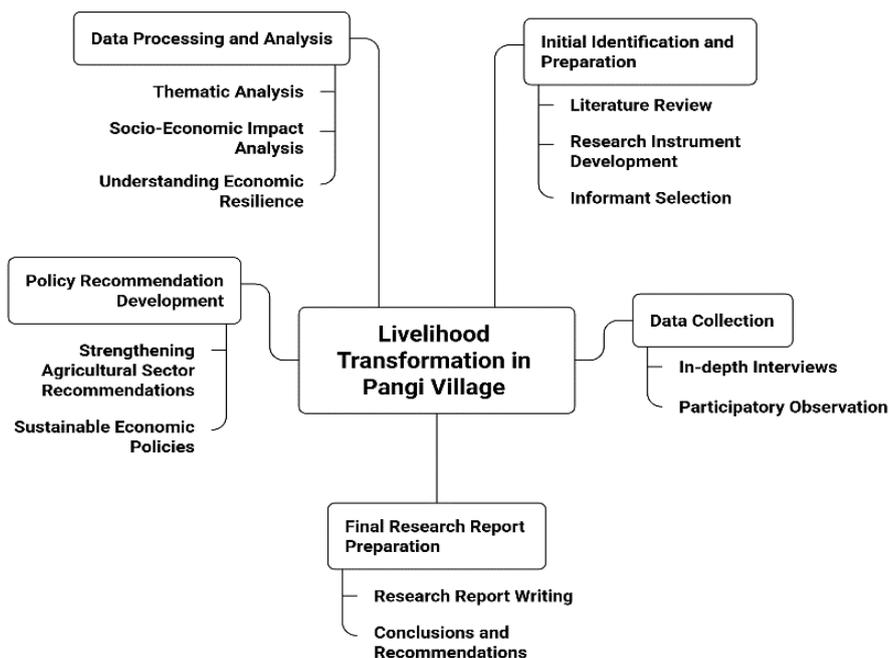


Figure 2. Stages of data analysis

The next stage involved qualitative data collection through in-depth interviews with farmers, gold miners, and community leaders to explore the factors influencing livelihood transitions and their socio-economic impacts. In addition to interviews, participatory observation was conducted to directly examine agricultural and gold mining practices, as well as to observe social dynamics within the community. Documentation was also utilized to gather secondary data that complemented interviews and observations, such as policy documents and local economic data.

Following data collection, the processing and analysis stage employed thematic analysis. The data obtained were analyzed to identify key themes related to livelihood changes, socio-economic impacts, and shifts in community social structures. This process aimed to provide an in-depth understanding of the factors driving livelihood transitions and their implications for the daily lives of the people in Pangli Village.

Based on the analysis, this study formulated policy recommendations to support local government efforts in managing livelihood transitions sustainably. These recommendations focus on strengthening the agricultural

sector, mitigating the negative impacts of gold mining, and improving community welfare while ensuring the sustainability of local economic sectors.

The study concludes with the preparation of a comprehensive research report, which presents analytical findings, policy recommendations, and conclusions on the socio-economic implications of livelihood transitions in Pangi Village. This report is expected to serve as a reference for more targeted policymaking and to contribute to sustainable development in the community.

Results and discussion

Social-economic dynamics: transition from agriculture to gold mining

The agricultural sector in Gorontalo Province, has previously discussed, plays a crucial role in the region's economy. According to data from the Central Statistics Agency of Gorontalo Province (2024), the agricultural sector contributes 37.75 percent to the Gross Regional Domestic Product (GRDP) of Gorontalo, with a value-added contribution of IDR 19.39 trillion. This significant contribution reflects the role of agriculture as a pillar of sustainable food security that supports the economic life of rural communities. In this context, the development of the agricultural sector is not only essential to ensure food security but also to foster inclusive and sustainable economic growth.

However, the situation in Pangi Village, Suwawa Timur District, Bone Bolango Regency, reveals a different reality. Based on field findings, the agricultural sector in the village has seen a significant decline in interest and community involvement. A majority of the villagers have shifted to the gold mining sector, primarily because it is perceived to offer better economic prospects. The income from mining, according to them, promises far greater welfare than agriculture, which is no longer considered capable of meeting the increasingly complex living needs. This phenomenon reflects a paradigm shift within the community, where the hope for quicker and more certain prosperity has become one of the dominant factors influencing their decision-making.

The shift in interest from agriculture to mining in Pangi Village can be understood by tracing the long history of agricultural activities in the village. Agricultural activities in Pangi Village have been ongoing since the 1960s, with agriculture becoming the main source of livelihood for the community by the 1970s. During this period, income from agriculture was relatively adequate, though still influenced by external factors such as unpredictable weather conditions.

Here is an excerpt from an interview with one of the informants who changed professions. They stated:

“By the 1970s, the community began focusing on farming as their main livelihood... However, since 2015, the harvests have been unstable due to changing weather patterns. Previously, one harvest could yield around IDR 1-3 million, but now that income is no longer sufficient for daily needs.” (Interview with YU [55 years old], Pangi Village Resident, July 18, 2025, 09:00-10:00).

The interview excerpt with YU (55 years old) highlights a significant change in the livelihood patterns of Pangi Village residents. Initially, agriculture had been an essential part of the community's life since the 1960s, and by the 1970s, it became the mainstay of their economy, focusing on crops such as corn, cassava, and vegetables. This reflects that agriculture not only served as an economic activity but was also deeply ingrained as a tradition and social identity of the community.

By 2015, the agricultural sector in Pangi Village began to experience a notable decline. According to the informant, the uncertainty of harvests due to increasingly erratic weather conditions became the primary factor in this decline. Previously, harvests could still generate an income of IDR 1,000,000 to IDR 3,000,000 every six months, but this amount was no longer enough to meet the family's basic needs. Additional costs, such as for fertilizers and labor, further reduced the net income of farmers, making it insufficient to keep up with rising living costs. This situation led most people to believe that agriculture could no longer provide a decent livelihood, prompting them to shift to other sectors perceived as more promising.

This shift from agriculture to gold mining is consistent with findings in similar rural communities globally. For instance, studies by [Baddianaah et al. \(2021\)](#) in Ghana, [Bansah et al. \(2023\)](#) in Guinea, [Ma'mun \(2016\)](#) in Sulawesi, and [Sari et al. \(2013\)](#) in West Sumatra, indicate that the decline in agricultural productivity due to increasing climate change "forces" rural farmers to shift to small-scale mining, which offers quicker financial returns. Similarly, the rise in gold prices has made mining a more attractive livelihood option for many, despite the associated environmental and social risks. [Oladele & Patekile \(2026\)](#) reinforce the view that escalating

climate risks are undermining global food security, and their impacts are also being felt by smallholder farmers in KwaZulu-Natal (KZN), South Africa. However, pressures on food security are not driven by climatic factors alone; they are also shaped by institutional capacity and the effectiveness of interventions. In Niger, [Zakari \(2026\)](#) explains that, despite substantial government efforts and support from international organizations such as the World

Food Programme (WFP) as well as various non-governmental organizations (NGOs), food security remains a persistent challenge affecting much of the population.

In the case of Pangi Village, the opportunity for faster, more substantial financial rewards from mining has overshadowed the community's long-standing reliance on agriculture. Mining not only promises better wages but also presents an opportunity to diversify income sources, making it an attractive option for individuals seeking more stability amid the economic uncertainties of agriculture.

This change in livelihood patterns, in turn, reflects broader changes in the social and economic conditions of the community. The concept of social-economic conditions refers to the position one holds within the community, regulated by social norms. This is evident in Pangi Village, where the majority of the population once relied on agriculture for their livelihood. However, as agricultural yields began to decline, particularly during long dry seasons or when crop prices plummeted, agriculture could no longer meet their basic needs. As a result, the community became more vulnerable to economic uncertainties, which has led many to experience ongoing financial difficulties.

The socio-economic impact of livelihood transition in the Pangi Village Community

In Pangi Village, Suwawa Timur, Bone Bolango Regency, the transition from agriculture to gold mining has become a phenomenon that marks a significant change in the socio-economic life of its community. Although agriculture has been the primary source of income for the villagers for several decades, increasing instability in agricultural yields, coupled with pressing economic needs, has prompted the community to seek more profitable alternatives. One such alternative is transitioning to the gold mining sector, which, despite its risks, offers the potential for much higher income in a relatively short time.

This shift not only impacts the income patterns of the community but also influences the social structure and relationships among individuals within the community. The people of Pangi Village, who were once heavily reliant on agricultural products, now face new challenges stemming from their dependence on the uncertain gold mining sector. With many villagers transitioning into gold mining, either individually or in work groups, this shift has led to the emergence of complex socio-economic dynamics. The effects of this change are most evident at the household level, where the uncertainty of agricultural outcomes and the rising cost of living have driven people to pursue more promising opportunities, despite the inherent risks.

The findings of [Adranyi et al. \(2023\)](#) in Ghana support the notion that the transition from agriculture to gold mining is often triggered by uncertainties in the agricultural sector, and frequently results in increased dependence on mining, which can lead to socio-economic disparities within communities. In Ghana, for example, this transition reveals that while shifting to gold mining may provide temporary financial gains, it also exacerbates income inequality between different groups within society.

Based on interviews with an informant who transitioned from farming to gold mining, HL (50 years old), this shift reflects the significant changes in the economic life of households in Pangi Village. HL shared:

“At that time, my income was only around IDR 500,000 per month. Even then, I had to be very frugal, and sometimes it wasn't even enough for food, let alone purchasing fertilizer. In 2020, I joined a workgroup led by Bos Haji Iko. Although the profit-sharing system is not always equitable, I can sometimes earn between IDR 10,000,000 and IDR 15,000,000 per month, depending on the amount of gold we find.” (Interview with HL [50 years old], Pangi Village resident, July 5, 2025, 11:30 AM - 3:00 PM).

This interview excerpt illustrates how the low income from the agricultural sector, which is often insufficient to meet basic needs, drives individuals to seek economic opportunities outside of agriculture. Previously, HL relied on agricultural products such as corn and vegetables for their livelihood, but with the increasing uncertainty in agricultural yields, they felt that the gold mining sector offered a way out of the difficult economic conditions. Although the profit-sharing system in gold mining is not always fair and sometimes depends on luck in finding gold, the prospect of much higher income led HL to transition to this sector.

The uncertainty of agricultural yields has been the main driving force behind this livelihood transition. For example, farmers in Pangi Village often face prolonged dry seasons or unpredictable rainfall, which damages their crops. Furthermore, the rising costs of fertilizers and other production expenses have increasingly burdened farmers, making the income from agriculture no longer sufficient to meet basic needs. As stated by KP (40 years old), another informant who also shifted from farming to gold mining:

“The income from farming is small and uncertain, sometimes even a loss. But in mining, even though it’s tiring and dangerous, the results come quickly, and you can make a lot of money in a short time.”
(Interview with KP [40 years old], Pangi Village resident, July 5, 2025, 4:00 PM - 5:15 PM).

This statement illustrates how attractive the mining sector is to people who were previously dependent on agricultural income. Although high-risk and demanding, gold mining offers the opportunity to earn higher income in a short period. This creates a social dilemma, where the community must choose between maintaining traditional, more stable yet insufficiently profitable jobs or transitioning to the mining sector, which is fraught with risks but offers the potential for much higher earnings.

Macháček et al. (2022) note that although the gold mining sector provides higher income opportunities, miners often face significant health risks and unsafe working conditions. Their study in Rwanda indicates that dependence on mining can have a negative impact on the long-term quality of life in the community, particularly in terms of health and social resilience.

Another factor driving this transition is the profit-sharing system in the gold mining sector. Although often unfair, this profit-sharing model provides opportunities for those in more demanding and risky positions to earn much higher wages than what they could from farming. According to an interview with YO (35 years old), a mine owner in Pangi Village, the wage system in the mining sector is highly dependent on the type of work performed. More labor-intensive and hazardous tasks, such as drilling and rock breaking, offer higher wages compared to lighter work.

“In one mining hole, there are usually several people with different tasks, and their wages depend heavily on the job position. If the mining results are good, each person can earn more than IDR 5 million per month, sometimes even more. For example, a driller, who has the toughest and most dangerous job, earns between IDR 7 million and IDR 9 million per month. A stone breaker, who separates the rocks containing gold, earns around IDR 6 million to IDR 7 million, while a tosmen, who lifts and cleans the broken stones, makes about IDR 5 million to IDR 6 million per month. Each person can earn up to IDR 12 million per month if they have no debt and receive bonuses from the mining results.” (Interview with YO [35 years old], Pangi Village resident, July 16, 2025, 4:00 PM - 5:15 PM).

This profit-sharing system explains why gold mining has become such an attractive alternative for the people of Pangi Village. Although the uncertainty of mining outcomes cannot be avoided, the potential for much higher income compared to the agricultural sector is the main draw for many individuals. Even those without specialized mining skills can still earn far more than they could from farming. This demonstrates that economic factors, particularly those related to income potential, are the main drivers of this livelihood transition.

However, despite the greater opportunities offered by the mining sector, the associated risks cannot be overlooked. Working in gold mining is highly dependent on luck, the physical condition of the workers, and the quality of the resources found. Additionally, health and safety risks in the mining sector are significant, with workplace accidents that can result in fatalities or serious injuries. This creates socio-economic uncertainty for those who rely entirely on this sector for their livelihood. While higher income can be earned, miners must face substantial challenges related to the harsh and hazardous working conditions.

This livelihood transition has also led to changes in social relationships within the village. Previously, the people of Pangi Village, who relied on agriculture as their primary source of income, lived in a more stable social structure, with a lifestyle focused on agricultural activities and mutual assistance among neighbors. However, as more people have shifted to gold mining, social relationships in the village have begun to change. Employment in the mining sector not only creates income disparities between individuals but also impacts the social conditions within the community. Those who succeed in striking it rich in mining may feel superior, while those who are less fortunate or fail in their mining endeavors must face greater difficulties in meeting their basic needs.

Mkodzongi and Spiegel (2019) reveal that small-scale gold mining (ASM), which has developed in many regions previously reliant on agriculture, has caused profound changes in the social and economic structure of households. They explain that the shift from agriculture to mining is not merely about replacing a source of

income, but also reflects changes in how communities utilize their resources. Communities that once relied on agriculture as their primary income source are now adjusting to a more complex economic reality, where gold mining offers more profitable opportunities despite the high risks involved.

Moreover, dependence on the mining sector can create long-term economic instability. Although gold mining offers higher income in the short term, the sector is highly dependent on fluctuations in gold prices and global market conditions. If gold prices fall or natural resources become increasingly difficult to find, miners will face economic difficulties similar to those they experienced in the agricultural sector. This indicates that the transition is not a sustainable long-term solution but rather a response to pressing economic conditions and growing uncertainties.

The above viewpoint is supported by [Poignant \(2023\)](#), who notes that although mining provides faster income, it remains fraught with uncertainty and relies on fluctuations in mining yields, which can significantly affect the long-term welfare of workers.

The livelihood transition in Pangi Village from agriculture to gold mining reflects a response to the economic uncertainties they face. While the mining sector offers higher income opportunities, this change brings significant socio-economic challenges, including dependence on a high-risk sector, income disparities between individuals, and long-term economic instability. This transition highlights the importance of policies that can support the sustainability of livelihoods and provide protection against the potential social and economic impacts that may arise from this shift.

[Teku et al. \(2025\)](#) emphasize that the transition to gold mining, while offering financial benefits in the short term, requires policies that support sustainability and mitigate socio-economic and environmental risks. In their study in Ethiopia, they found that without effective policies, small-scale mining can lead to environmental degradation and greater socio-economic instability in communities dependent on the sector.

Socio-economic adaptation strategies in facing economic uncertainty

Field research findings reveal that despite a significant decline in interest among the people of Pangi Village to develop the agricultural sector, as well as a high tendency to shift to the mining sector in response to the economic uncertainty affecting agriculture, there remains a segment of the community that chooses to stay and continue developing agriculture. This phenomenon reflects the complexity of the socio-economic adaptation occurring in the village, where despite a sharp decline in the agricultural sector, some groups of people continue to maintain their traditional professions for various personal, cultural, and even structural reasons.

This decision, although it appears to deviate from the general trend, demonstrates a deep understanding of traditional values and long-term food security. One informant I interviewed stated:

“I continue farming because this is a job that has been passed down from my parents. There was an offer to switch to mining, but I’m still thinking it over because mining is tough and risky, especially since I’m old and my physical strength is lacking. I started farming when I was 20, around 1991, and now I’ve been farming for over 30 years. If you call it sufficient, it’s just enough because I’m used to living frugally, and I also have sweet potatoes and bananas as extra.” (Interview with IB [55 years old], Pangi Village resident, July 10, 2025, 9:00 AM - 10:15 AM).

Based on this interview excerpt, the informant's decision to continue farming is influenced by the interaction of cultural, personal, and economic factors. The informant revealed that farming is not just a source of income but also a part of their social identity passed down through the generations within the family. This reflects the strong influence of traditional values in decision-making, where this profession is not only a means to meet economic needs but also a symbol of social and cultural continuity within the family. [McCarthy \(2022\)](#) points out that the continued presence of farming in rural areas is greatly shaped by the societal importance placed on land, making agriculture not merely an economic pursuit but a representation of individual and collective identity. Similarly, [Li et al. \(2024\)](#) argue that many farmers continue their agricultural practices due to a strong social identity that has been influenced by historical ties and family traditions related to farming.

On the other hand, although the mining sector offers the potential for higher income, the informant chose to continue farming due to the higher risks associated with the mining sector. Age and declining physical condition were also crucial elements in this decision, as mining is considered a physically demanding and hazardous job. This decision shows that the informant prioritizes long-term security over the immediate profits offered by the mining sector. [Banchirigah \(2010\)](#) highlights that mining carries significant risks, with many people in rural areas hesitant to switch to mining due to its dangerous nature and the intense physical labor it

demands. In addition, [Caulfield et al. \(2021\)](#) observe that for numerous rural families, the stability and perceived safety of farming are more appealing than the potential for higher, yet uncertain, earnings from mining, especially when considering the physical strain that mining imposes on the body. The choice to continue farming reflects a preference for long-term stability and security over the unpredictable and risky aspects of mining.

Although the income from farming is described as "just enough," the informant demonstrates socio-economic resilience by living frugally and relying on additional agricultural products, such as cassava and bananas. This approach illustrates how individuals adapt to economic constraints and manage resources in a way that allows them to maintain a stable livelihood despite challenging economic conditions. [Caulfield et al. \(2021\)](#) describe how rural households in similar contexts adopt diversified livelihoods, utilizing off-farm income alongside farming to strengthen their economic resilience. Moreover, [McCarthy et al. \(2022\)](#) further support this by explaining that living frugally and relying on multiple income sources is a common adaptive strategy that helps rural households maintain stability and manage economic uncertainty.

Thus, the decision to continue farming shows that socio-economic changes in Pangi Village are influenced not only by direct economic factors, such as income and short-term profits, but also by deeper social and cultural factors. Traditional cultural values embedded in farming and considerations related to security and risks in the mining sector provide deeper insight into the complexity of community decisions in the face of socio-economic changes. Even though the agricultural sector is declining, the existence of a group that remains resilient enriches our understanding of broader dynamics, where social identity and long-term security play just as important a role as economic factors. As [Hajdu et al. \(2024\)](#) and [McCarthy \(2022\)](#) suggest, decisions to persist in farming are often shaped by cultural values and the sense of community identity associated with farming, demonstrating that social and cultural dimensions play an important role alongside economic considerations in shaping livelihood decisions.

The role of government policy in maintaining agricultural sector sustainability

Based on Regional Regulation No. 11 of 2014 regarding the Protection of Sustainable Food Agricultural Land, various efforts have been made by local governments to maintain the sustainability of the food agricultural sector, particularly in addressing the increasingly rampant land conversion. This regulation focuses on the protection of agricultural land by emphasizing the importance of planning, control, and empowering farmers. One important point stipulated in this regulation is the need for the designation of sustainable food agricultural land in the regional spatial planning, implemented through a series of processes such as socialization with farmers, inventory, and mutual agreement between the government and landowners.

In addition, this regulation also governs the control of land conversion by providing policies that limit the conversion of agricultural land into non-agricultural land, except for public interests or natural disasters. Local governments are required to replace the converted land, ensuring that there is no permanent reduction in the area of food agricultural land. This aligns with the regulation's objective of maintaining food security and supporting regional food sovereignty. In its implementation, this regulation also involves the community to participate in the protection and supervision of agricultural land, as well as in providing input regarding the existing plans and policies.

To demonstrate that the protection of agricultural land is pursued not only through regulatory control mechanisms but also through an incentive-based policy approach, the local government has formally provided incentives to key stakeholders in the agricultural sector. Even Regional Regulation (Peraturan Daerah) No. 11 of 2014 on the Protection of Sustainable Food Agricultural Land, Chapter IX, Section Two (Incentives), Article 21, states:

- “Incentives as referred to in Article 20(a) shall be granted to landowners, tenant farmers, and/or farmer groups in the form of:
- (a) reductions in land and building taxes;
 - (b) development of agricultural infrastructure;
 - (c) utilization of research and development outputs for superior seeds and seedlings;
 - (d) facilitated access to information and technology;
 - (e) provision of agricultural production facilities and infrastructure;
 - (f) guarantees for the issuance of land certificates for food agricultural land through sporadic and systematic land registration; and/or
 - (g) awards for high-performing farmers.”

Despite the strong legal foundation provided by Regional Regulation No. 11 of 2014 for protecting the agricultural sector, the economic challenges faced by many people in Pangi Village have driven them to shift to the mining sector. The increasingly difficult economic conditions, with unstable agricultural commodity prices and rising production costs, have made the agricultural sector no longer able to provide adequate welfare guarantees for farmers. Many farmers are struggling to meet their daily needs, and the agricultural sector, which was once their primary livelihood, is now seen as a less profitable option.

“Many residents are now leaving their farms and turning to gold mining because agricultural yields are no longer enough to meet their needs. Agricultural commodity prices are unstable, often resulting in losses due to pests or crop failures. Even though mining activities do not always yield results—some even return empty-handed or end up in debt—residents still consider mining more promising. Stories of success from those who have made significant profits encourage others to try their hand at mining.” (Interview with EH [45 years old], Village Apparatus of Pangi, June 21, 2025, 08:00–09:15).

In this interview, it is clear that economic factors play a crucial role in the decision of some residents of Pangi Village to abandon agriculture and shift to gold mining. One of the main reasons cited is the instability of agricultural commodity prices, making farmers' incomes difficult to predict. Price fluctuations, as well as threats from pests and crop failures, increase the uncertainty in the agricultural sector. This creates insecurity for farmers, ultimately driving them to seek alternative sources of income that appear more profitable. As noted by [Wu et al. \(2024\)](#), factors such as risk preference and income uncertainty significantly influence rural livelihood transitions, particularly when agricultural sectors become unpredictable and less reliable.

The decision to switch to gold mining reflects the community's perception that this sector offers greater opportunities in the face of persistent economic difficulties. Despite the government's strong regulations aimed at protecting agricultural land, the reality is that economic pressures often take precedence over these policies. In many cases, even when the importance of agricultural sustainability is acknowledged, economic factors compel much of the population to shift to a sector that appears to offer more immediate and promising financial returns.

This shift highlights a complex issue concerning the gap between agricultural land protection policies and the economic needs of the community. Although government policies focus on safeguarding the agricultural sector, they fail to address the underlying economic challenges that farmers face. Without concrete measures to improve the competitiveness of the agricultural sector, such as better market access, financing, and the adoption of advanced agricultural technologies, the shift in livelihoods from farming to mining will continue. As [Singgalen et al. \(2022\)](#) point out, global economic pressures and the availability of new economic opportunities, such as mining and tourism, have led to similar livelihood transformations in other rural communities, demonstrating the need for policies that address both the immediate and long-term needs of rural populations.

Not only the district government but also the Pangi Village government has made efforts to improve the agricultural sector and reduce the shift of professions to mining. For example, in 2018, the village government launched the farmers' welfare improvement program, which includes seed assistance, modern agricultural training, the construction of simple irrigation systems, as well as business training and coaching.

The goal of this program is to provide alternatives for residents so that they can see the potential and benefits of farming in a more efficient and profitable way. However, despite these efforts, the community's response has been relatively lackluster. They feel that agricultural yields are not sufficient to meet their needs, and the village program is seen as slow in providing tangible impacts on their welfare. This indicates a mismatch between the government's efforts and the community's pressing need for quicker and higher income, such as that offered by the gold mining sector.

Here is the interview result with a Pangi Village official:

“We in the village have actually appealed several times for residents not to abandon their agricultural land, even launching an agricultural assistance program in 2018. The village government launched the farmers' welfare improvement program, which included seed assistance, modern agricultural training, simple irrigation construction, and business training and coaching so that they could see other options besides gold mining. In reality, the community's response has been less enthusiastic, as they feel that agricultural results no longer meet their needs, and the village program is seen as slow. However, there is no desire among the residents to try farming again.” (Interview with EH [45 years old], Village Apparatus of Pangi, June 21, 2025, 08:00–09:15).

In the interview above, the village official stated that despite various efforts undertaken to prevent residents from leaving the agricultural sector, many community members continue to shift to gold mining. Although the mining sector is also risky, with many returning empty-handed or even in debt, residents feel that the opportunity to earn large amounts of money quickly is much more promising than farming, where income is more uncertain. This phenomenon shows that the decision to switch from farming to gold mining is not only the result of rational consideration regarding short-term financial benefits but is also influenced by social norms that highlight success stories from those who have succeeded in the mining sector.

This condition reveals that the agricultural protection policies implemented by the village government have not been effective enough, as they have not been able to provide quick and tangible solutions for improving farmers' welfare. Therefore, to address the increasing shift in livelihoods, more responsive policies are needed, which not only rely on assistance programs but also offer practical solutions that can yield results in the short term.

Nevertheless, it should be noted that the village government's efforts in launching agricultural assistance programs and training have not been entirely unsuccessful. However, the mismatch between the community's urgent need for quick income improvements and the program's long-term orientation highlights the need for policy adjustments. To make agriculture a viable option for the community, a more holistic approach is required, including improving access to markets, supporting agricultural diversification, and enhancing adequate infrastructure. Without more effective and quick solutions to address farmers' economic difficulties, the agricultural sector will remain threatened, and the shift to mining professions may continue to grow. In this regard, synergy between government policies and community empowerment is key to achieving agricultural sustainability that aligns with the existing socio-economic needs.

Conclusion

The livelihood transition from agriculture to gold mining in Pangi Village reflects a complex socio-economic dynamic influenced by economic, social, and environmental factors. While the agricultural sector holds potential for supporting the community's well-being, the instability of agricultural commodity prices and the uncertainty of harvests due to changing weather patterns have driven many farmers to shift to the gold mining sector, which is perceived to offer higher and faster income opportunities.

Government policies, such as Regional Regulation No. 11 of 2014 on the Protection of Sustainable Food Agricultural Land, provide a strong legal foundation for protecting the agricultural sector. However, the economic challenges faced by the community, such as unstable agricultural commodity prices and rising production costs, make agriculture no longer a reliable livelihood option. This highlights an imbalance between agricultural land protection policies and the pressing economic needs of the community.

This livelihood shift underscores the need for improved competitiveness within the agricultural sector and more effective farmer empowerment through responsive policies, including better market access, financing, and the adoption of advanced agricultural technologies. A synergy between land protection policies and farmer empowerment is crucial to ensuring the long-term sustainability of the agricultural sector amidst the evolving economic landscape.

Despite the village government's efforts to launch the farmers' welfare improvement program, the community's response has been relatively lukewarm, as agricultural yields are insufficient to meet their needs. Therefore, policy adjustments are needed to address the community's urgent demand for faster and higher income. These adjustments should aim to provide short-term practical solutions while promoting long-term agricultural sustainability.

Recommendations

Based on the above conclusion the following recommendations are made:

1. The government must stabilize agricultural commodity prices and subsidize production costs to make farming a competitive financial alternative to gold mining.
2. Introducing climate-resilient farming technologies is essential to mitigate the high risks of harvest failure caused by changing weather patterns.
3. The farmers' welfare improvement program requires immediate adjustments to offer tangible, short-term financial relief rather than just long-term goals.

4. Policymakers must create a synergy between strict land zoning laws and active farmer empowerment to secure the sector's long-term sustainability.

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Conflict of interest

The author declares that there is no conflict of interest regarding the publication of this article.

Statement of originality and plagiarism-free

The authors declares that this article is an original work that has not been published elsewhere and is free from plagiarism. All references and citations have been properly acknowledged in accordance with applicable standards.

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