

Women's Economic Vulnerability in Unlicensed Gold Mining Areas in Sarolangun Regency: Adaptation and Resilience

Norashikim & Addiarrahman

UIN Sultan Thaha Saifuddin Jambi, Indonesia

shikinn503@gmail.com; addiarrahman@uinjambi.ac.id

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Abstract

Women in communities dependent on unlicensed gold mining (*Pertambangan Emas Tanpa Izin*, PETI) face unstable household income, limited formal employment, and inadequate social protection. However, the relationships among women's economic vulnerability, adaptive practices, and resilience remain insufficiently examined in Sarolangun Regency. This study analyzed women's economic vulnerability and explored the strategies used to sustain household livelihoods. A qualitative field study involved 10 purposively selected informants in Teluk Rendah Village, Cerminan Gedang District. Data were collected through in-depth interviews, observation, and documentation and analyzed inductively through data reduction, display, and verification. The findings identified irregular income, dependence on informal employment, limited savings, insufficient social protection, and restricted livelihood alternatives as interconnected dimensions of vulnerability. Women adapted by diversifying income sources, prioritizing essential household expenditure, drawing on social networks, and using informal borrowing arrangements. Their resilience was predominantly oriented toward survival and adaptation rather than transformative change. These findings characterize vulnerability, adaptation, and resilience as interconnected livelihood processes and highlight the limitations of strategies centered on immediate household survival. The study provides contextual insights for developing gender-responsive livelihood alternatives, access to productive capital, social protection, and economic empowerment programs for women in mining-dependent communities.

Keywords: Economic Adaptation; Economic Vulnerability; Resilience; Unlicensed Gold Mining; Women's Livelihoods

INTRODUCTION

Women's participation in economic life has become increasingly important to household welfare, poverty reduction, and the sustainability of family livelihoods. Paid work allows women to contribute directly to household income, yet access to employment does not necessarily provide equal economic security. Women remain disproportionately represented in forms of work characterized by unstable earnings, limited social protection, unpaid family responsibilities, and weak bargaining power. The International Labour Organization (2024) notes that women continue to encounter structural barriers in the labour market, particularly where employment is informal and family responsibilities remain unequally distributed. Economic participation should therefore be understood not only in terms of whether women work, but also in relation to the quality, stability, and security of the livelihoods available to them. These concerns are particularly important for women living in resource-dependent communities, where household income can fluctuate sharply in response to changes in local economic activity (Buvinić & Furst-Nichols, 2016; Chant & Sweetman, 2012).

Artisanal and small-scale mining represents one setting in which livelihood opportunities and economic insecurity often coexist. Mining can generate employment, stimulate local trade, and provide income for households with few alternatives, but much of the sector operates informally and outside adequate labour and social protection systems. Women constitute a substantial part of the artisanal and small-scale mining economy, although their work is frequently concentrated in less visible, less profitable, or supporting activities. The World Bank (2024) reports that women account for approximately one-quarter to one-third of workers in artisanal and small-scale mining globally, while a large proportion of mining activity remains informal. Research also shows that women's access to capital, productive assets, occupational mobility, and decision-making positions tends to be more restricted than men's, leaving them exposed to economic and occupational risks even when mining creates new sources of income (Busia & Arthur-Holmes, 2024; Ofosu et al., 2022; World Bank, 2024).

The Indonesian context reflects a similar tension between women's increasing economic contribution and the social conditions that shape the work available to them. Gender norms continue to influence how paid employment is negotiated within households, particularly because women are commonly expected to retain primary responsibility for childcare and domestic work. Setyonaluri et al. (2021) found that women's employment decisions in Indonesia are closely connected to household gender roles, with flexibility becoming an important consideration when paid work must be combined with care responsibilities. More recent research by Setyonaluri & Utomo (2024) similarly demonstrates that marriage, childcare, spatial constraints, and workplace arrangements influence whether women remain in, leave, or return to employment. Such conditions can encourage women to enter informal and locally accessible forms of work because these occupations can be combined more readily with household responsibilities. Informality may create room for women to earn income, but it can also leave them without stable wages, formal contracts, insurance, or adequate protection during periods of economic disruption.

Unlicensed gold mining, locally known as *Pertambangan Emas Tanpa Izin* (PETI), has become deeply embedded in the livelihood landscape of several districts in Jambi Province, including Sarolangun Regency. KKI WARSI has documented the continuing expansion of land affected by illegal gold-mining activity in Jambi, particularly along river systems and rural livelihood areas. Historical monitoring in Sarolangun recorded an expansion from approximately 6,370 hectares in 2016 to 15,878 hectares in 2022, illustrating how rapidly mining has transformed local spaces of production and livelihood (KKI WARSI, 2022). This development takes place within a district where poverty, employment insecurity, and limited livelihood alternatives remain important concerns for households (Badan Pusat Statistik Kabupaten Sarolangun, 2024). Mining consequently occupies an ambivalent position in everyday life: it provides an immediate source of income for some families while simultaneously creating dependence on an unstable, informal, and environmentally disruptive economic activity. Such dependence becomes particularly consequential for women whose responsibility for household survival continues even when mining income declines or disappears.

Economic vulnerability in this setting cannot be reduced simply to low income. It concerns the extent to which women and their households are exposed to economic shocks and the resources available to withstand them. Restricted access to savings, productive assets, formal employment, credit, social protection, and alternative livelihoods can make even a

temporary loss of income difficult to absorb (Buvinić & Furst-Nichols, 2016; Chant & Sweetman, 2012). Informal economies may provide livelihood opportunities where formal employment is scarce, but income tends to be less predictable and workers frequently carry risks that would otherwise be shared with employers or public institutions (Williams, 2019). From a resilience perspective, households do not merely experience these pressures passively. They reorganize resources, adjust spending, diversify work, mobilize social relationships, and develop ways of continuing everyday life under uncertain conditions. Ungar (2021) understands resilience as a process involving interaction between individuals and the social, economic, and institutional resources available around them. Adaptation and resilience must therefore be examined alongside vulnerability rather than treated as evidence that vulnerability has disappeared.

Studies conducted in mining communities have shown that women often assume an important economic role when household livelihoods depend on extractive activities. Sulastri (2019), for example, found that women in gold-mining families contributed to household economic survival through income-generating activities undertaken alongside their domestic responsibilities. Hasrizal & Mardhiah (2021) similarly drew attention to the multiple roles carried by women in gold-mining communities. These findings challenge the assumption that mining economies are sustained exclusively by male miners; household survival also depends on women's paid and unpaid work. Lahiri-Dutt (2018) has argued more broadly that informal and artisanal mining economies need to be understood through the everyday livelihood practices surrounding extraction, including activities that are often economically important but remain statistically or socially invisible. Women's contributions in such settings may therefore extend far beyond direct involvement at mining sites.

Research on informal gold economies also demonstrates that women's participation does not necessarily translate into equal control over economic resources. Devi et al. (2024), studying informal gold trading in Central Kalimantan, found that the organization of gold trading is strongly gendered, with women and men occupying different positions within the value chain and operating within unequal power relations. Comparable evidence from artisanal and small-scale mining communities shows that women may develop livelihoods through petty trade, home-based businesses, temporary work, services, or activities connected indirectly to mining, yet these livelihoods remain vulnerable to changes in mining activity and access to local resources (Arthur-Holmes et al., 2023). A recent review by Busia & Arthur-Holmes (2024) further shows that scholarship on women in artisanal mining has

increasingly addressed employment, occupational segregation, safety, formalization, migration, empowerment, and sustainable livelihoods, but important empirical and conceptual gaps remain in understanding how women navigate economic insecurity across different local mining contexts.

Existing studies provide valuable explanations of women's contribution to mining households, gendered participation in informal gold economies, and the risks surrounding artisanal mining. Less attention has been given to the relationship between economic vulnerability, women's adaptive practices, and household resilience as an interconnected process, particularly in communities shaped by unlicensed gold mining in Sarolangun Regency. Studies of household resilience commonly show that families respond to economic pressure through livelihood diversification, changes in consumption, informal borrowing, and social networks Rachmawati et al. (2025), but these strategies may represent different levels of resilience. Some responses allow households only to survive immediate hardship, while others create a stronger capacity to manage future disruptions. Bringing a gendered livelihood perspective Lahiri-Dutt (2018) into dialogue with multisystemic resilience Ungar (2021) makes it possible to examine not only the risks women face but also how they negotiate those risks through available economic, household, and social resources. This perspective shifts attention from portraying women simply as economically vulnerable subjects toward recognizing them as actors who make difficult livelihood decisions within constrained circumstances.

This study addresses that gap by examining women's economic experiences in communities affected by unlicensed gold mining in Sarolangun Regency. The study focuses on the forms and sources of economic vulnerability experienced by women, the adaptive strategies they use when confronting unstable household income and limited livelihood opportunities, and the ways these practices contribute to or constrain household economic resilience. By placing vulnerability, adaptation, and resilience within the same analytical frame, this research seeks to provide a more grounded understanding of how women sustain family life in an economy shaped by informality and uncertainty. The study therefore aims to analyze women's economic vulnerability in unlicensed gold mining areas of Sarolangun Regency and to understand the forms of adaptation and resilience through which they seek to maintain the continuity of household livelihoods.

METHODS

This study employed a qualitative approach with a field-based research design to examine women's economic vulnerability, adaptation, and resilience in a community affected by unlicensed gold mining (*Pertambangan Emas Tanpa Izin* or PETI). A qualitative approach was considered appropriate because the study sought to understand how economic insecurity was experienced, interpreted, and managed in women's everyday lives rather than to measure the phenomenon solely through numerical indicators. Qualitative research enables researchers to explore participants' experiences, perceptions, motivations, and social realities within their natural setting (Kasiram, 2008; Moleong, 2007). The study was conducted in Teluk Rendah Village, Cerminan Gedang District, Sarolangun Regency, an area directly affected by PETI activities. The research focused particularly on the economic experiences of women living in the mining environment, while also considering the perspectives of other actors whose livelihoods and social roles were closely connected to local mining activities.

Informants were selected purposively according to their direct involvement in PETI activities or their knowledge of the socioeconomic conditions of the community. Purposive selection allowed the study to involve individuals who could provide rich and contextually relevant accounts of the phenomenon under investigation. A total of ten informants participated in the study, consisting of one owner or manager of an unlicensed gold-mining operation, four workers directly involved in mining activities, three women experiencing economic vulnerability in the PETI area, and two community leaders or village officials. The inclusion of participants from different social positions was intended to provide multiple perspectives and to strengthen the credibility of the findings. Primary data were obtained directly from informants, while secondary data were drawn from relevant documents and existing reports (Sugiyono, 2009). Data were collected through direct observation, in-depth interviews, and documentation. Observation was used to understand the economic and social conditions surrounding women's daily lives, while interviews provided space for participants to describe their experiences, concerns, livelihood choices, and responses to economic uncertainty in their own words. Documentation, including photographs, records, and other relevant materials, was used to complement and contextualize the interview and observational data. Data credibility was strengthened through *member checking*, source triangulation, and technique triangulation by comparing information obtained from different informants and across interviews, observations, and documentation.

The data were analyzed inductively throughout the research process. Interview recordings and field notes were first organized and, where necessary, transcribed before being read repeatedly to identify information relevant to women's economic vulnerability, adaptive practices, and household resilience. Following the qualitative analytical procedure described by Afrizal (2016), the analysis involved three interconnected stages: data reduction, data display, and conclusion drawing or verification. During data reduction, information that directly addressed the research focus was selected, coded, and grouped into meaningful categories. The resulting categories were then organized to identify recurring patterns and relationships among economic pressures, livelihood responses, and forms of resilience. Conclusions were developed through continuous interpretation of the emerging themes and were subsequently checked against the original interview accounts, field observations, and documentary evidence. This process allowed the analysis to remain closely connected to participants' lived experiences while also identifying broader patterns in how women negotiated economic uncertainty within an unlicensed gold-mining community.

RESULTS

1. Research Setting and the Socioeconomic Context of Unlicensed Gold Mining

The fieldwork showed that unlicensed gold mining (*Pertambangan Emas Tanpa Izin*, PETI) has become closely intertwined with everyday economic life in Teluk Rendah Village, Cerminan Gedang District, Sarolangun Regency. Mining activities were located near riverbanks, open land, residential areas, and land that had previously been used for agricultural purposes. The proximity between mining sites and settlements made PETI more than a workplace; it formed part of the village economy through direct mining employment, food stalls, small-scale trading, transportation, and other informal services.

Field observations revealed visible changes in the physical environment surrounding the mining sites. Excavated land, wet and muddy surfaces, open pits, and areas of standing water were found around several locations. Heavy equipment was also present at some mining sites, indicating that mining practices had moved beyond small-scale manual extraction. Figure 1 presents the physical setting of PETI activities in Teluk Rendah Village, while Figure 2 shows the use of heavy equipment at one of the observed mining locations.



Figure 1. PETI Mining Sites in Teluk Rendah Village, Cerminan Gedang District

Figure 1 presents field documentation of PETI locations situated near riverbanks and open land. The photographs show excavated surfaces, muddy areas, and changes in land structure associated with mining activities.



Figure 2. Heavy Equipment at a PETI Site in Teluk Rendah Village

Figure 2 shows heavy equipment operating within the mining area. Its presence illustrates the increasing intensity of extraction and the close relationship between mining activities, local livelihoods, and environmental change.

The location of mining activities near residential areas also demonstrated the degree to which the local population was economically connected to PETI. Community members were involved not only as mine owners and workers but also through secondary economic activities that depended on the circulation of mining income. Women were particularly visible in these supporting activities. They managed household expenditure, operated small shops, prepared food, participated in some mining-related work, and sought alternative income when mining activities were interrupted. This position placed women at the intersection between household responsibility and an unstable informal economy.

2. Women's Economic Vulnerability in the PETI Area

The findings identified income instability as the most immediate form of economic vulnerability experienced by women in mining households. Household income depended heavily on the amount of gold obtained, the operation of the mining site, weather conditions, and the continuity of mining activities. The profit-sharing system did not provide workers with a fixed income. Earnings could be relatively adequate when gold was found, but households could also experience several days or even weeks without income.

A 45-year-old female mining worker described this uncertainty:

“Income depends on the result. Sometimes we get something, sometimes we do not. If gold is found, it is shared. If there is no gold, then none of us has any money.”

A woman whose husband worked in mining similarly explained that household expenditure could not be planned on the basis of a stable monthly income:

“We cannot calculate a fixed income, so even our spending depends on whether there is money or not.”

The interviews showed that this irregular income restricted women's ability to make medium- and long-term financial plans. Money received during productive periods was generally directed toward food, children's education, health expenses, debt repayment, and other immediate household needs. Saving regularly was therefore difficult. A 45-year-old female informant explained:

“When we find gold, thankfully it can be enough to pay debts and cover monthly expenses. But sometimes there is no result for a whole week. We cannot always keep money in hand. Sometimes we plan to save it, but it is used again for an urgent need.”

Economic vulnerability became more severe when mining activities were interrupted by law-enforcement operations. Informants repeatedly described raids as moments when household income could stop abruptly. Mining equipment could no longer be operated, workers temporarily lost their jobs, and families had to meet daily needs without knowing when income would resume. One female informant stated:

“When there is a raid, the mine stops. There is no income at all. We have to find another way to keep the kitchen running.”

A male mining worker expressed a similar concern:

“The raids are the hardest part. It is not only about being afraid; there is simply no money coming in at all.”

These interruptions created a recurring cycle of work, temporary cessation, loss of income, and eventual return to mining when conditions became less restrictive. The interviews suggested that households often returned to PETI because alternative employment capable of providing comparable short-term income was limited. A mine owner explained:

“If there were another job with clear and sufficient income, people would certainly choose the safer one. But so far, there is none.”

A village official also estimated that a substantial proportion of residents depended economically on mining and argued that restricting PETI without providing alternative livelihoods would create additional difficulties for local families.

The economic vulnerability identified in the interviews can be summarized into five interconnected dimensions, as shown in Table 1.

Table 1. Main Forms of Women’s Economic Vulnerability in the PETI Area

No.	Dimension of Vulnerability	Empirical Condition Identified in the Field	Consequences for Women and Households
1	Income instability	Mining income depended on gold yields and was received irregularly.	Difficulty planning household expenditure and saving.
2	Dependence on PETI	Household livelihoods relied heavily on mining and mining-related activities.	Loss of income when mining stopped.
3	Limited employment alternatives	Few formal or stable jobs were available locally.	Continued dependence on informal work.
4	Limited savings and social protection	Most income was spent on immediate household needs.	Weak capacity to respond to illness, accidents, or sudden income loss.
5	Environmental and livelihood pressure	Mining affected land and water resources used for other livelihoods.	Reduced possibilities for agriculture and other alternative income sources.

Table 1 shows that women’s economic vulnerability did not arise from a single source. Rather, instability was produced by the interaction between uncertain mining income, limited employment alternatives, weak household savings, limited access to formal protection, and changes in local livelihood resources. Women were particularly exposed

because they remained responsible for ensuring that food, schooling, health care, and other household needs continued to be met even when the main source of family income disappeared.

3. Women as Economic Buffers within Mining Households

The findings also revealed that women were not merely recipients of the economic consequences of PETI. They frequently acted as household economic buffers when mining income declined. Although most women were not positioned as primary mine owners or principal miners, their economic contribution became especially important during periods of income disruption.

A mine owner described this pattern: “When the mine stops, usually the wives are the ones who look for ways to keep the household going. Some open small stalls, and some borrow here and there.”

Women’s contribution often remained informal and relatively invisible. Their work included managing small shops, preparing food, engaging in petty trade, helping with gold-washing activities, borrowing goods from trusted suppliers, and obtaining short-term loans from relatives or neighbours. One 34-year-old woman who operated a small grocery stall explained:

“I usually add stock little by little. If I do not have enough capital, I take the goods first from the shop I usually buy from and pay after they are sold. Sometimes I also borrow from relatives.”

Another female mining worker described combining domestic responsibilities with activities connected to mining:

“If I only depend on my husband, it does not feel sufficient. So I also help wash the gold or prepare food. The income is not much, but at least it adds something.”

These accounts show that women’s economic participation was shaped by necessity and flexibility. Their economic activities were generally small in scale and did not always provide a stable independent income, yet they helped prevent an immediate collapse in household consumption when mining earnings declined.

4. Economic Adaptation Strategies

Four recurring forms of economic adaptation emerged from the interviews: livelihood diversification, expenditure prioritization, reliance on social networks, and the use of household-based skills for income generation.

Livelihood diversification was one of the most visible strategies. Women established small grocery stalls, prepared food, engaged in petty trading, helped with mining-related activities, and used other practical skills available within the household. A 34-year-old woman who ran a small shop described the role of her business during periods when her husband received little or no mining income:

“The shop is not always busy, but when my husband earns nothing, this shop saves the children’s meals.”

The importance of this small business was not necessarily reflected in high profits. Its value lay in providing a modest but relatively accessible source of cash or food during periods when mining income was absent.

Household financial management formed another important adaptation strategy. Women reported reducing discretionary spending and directing available money toward food, school expenses, and other necessities. Larger purchases were postponed when income was uncertain. A 28-year-old woman whose husband worked in mining explained:

“When my husband’s income goes down, I reduce spending on things that are not important. The priorities are rice, simple side dishes, and the children’s school needs.”

Social relationships also functioned as an informal economic safety net. Women borrowed money from relatives and neighbours, obtained goods on credit from local shops, and relied on trusted personal relationships when cash was unavailable. These arrangements enabled households to bridge short periods of income loss without immediately losing access to food and other necessities.

Table 2. Women’s Economic Adaptation Strategies in PETI-Affected Households

No.	Adaptation Strategy	Forms Identified in the Field	Immediate Function
1	Livelihood diversification	Small shops, food preparation, petty trade, helping with mining-related work	Generating supplementary household income
2	Expenditure prioritization	Reducing non-essential spending and prioritizing food and education	Maintaining basic household consumption

No.	Adaptation Strategy	Forms Identified in the Field	Immediate Function
3	Informal borrowing	Borrowing from relatives, neighbours, and trusted local sellers	Meeting urgent needs during income shortages
4	Use of household skills	Cooking, trading, service activities, and other home-based work	Converting available skills into small-scale income
5	Flexible household roles	Women combining domestic responsibilities with productive work	Compensating for fluctuations in the main household income

The strategies presented in Table 2 show that adaptation was based largely on resources already available within the household and community. Most of these strategies did not require large amounts of capital, but they demanded considerable flexibility from women, who often had to combine productive work with childcare and other domestic responsibilities.

5. Mechanisms of Women's Economic Resilience

The findings indicate that women's resilience developed through a combination of personal persistence, household financial management, livelihood diversification, social support, and a long-term commitment to their children's education. Resilience in this context did not mean that economic insecurity had disappeared. Rather, it referred to the ways women continued to organize family life despite repeated disruptions to household income.

Three forms of resilience were identified from the interview data. The first was short-term economic resilience, expressed through expenditure reduction and consumption management. When income declined, women reorganized household budgets and prioritized basic needs. These decisions enabled families to maintain daily consumption even under severe financial constraints.

The second was adaptive resilience, which emerged through diversification and social networks. Small-scale trading, informal work, borrowing, and reciprocal assistance helped households respond to changes in mining income. A female informant explained:

"If there really is no money, we usually borrow first from family or close neighbours. When there is income again, we pay it back."

This account illustrates the importance of trust and reciprocal relationships in maintaining household consumption during periods of financial crisis. Social networks acted as an informal buffer in circumstances where formal credit and institutional assistance were difficult to access.

The third was a more future-oriented form of resilience, centred on children's education. Several women linked their willingness to endure present economic hardship to the hope that their children would eventually have livelihood opportunities outside the mining economy. One informant stated:

“We are willing to work hard now so that our children can go to school and have a better life.”

Education was therefore understood not only as a household expense but also as a possible pathway out of long-term dependence on PETI.

The relationship among vulnerability, adaptation, and resilience identified in the study is summarized in Table 3.

Table 3. Relationship Between Economic Vulnerability, Adaptation, and Resilience

No.	Economic Pressure	Women's Response	Form of Resilience
1	Irregular mining income	Reducing non-essential spending	Short-term economic resilience
2	Temporary loss of mining income	Opening small businesses or taking informal work	Adaptive livelihood resilience
3	Lack of cash for daily needs	Borrowing through family and neighbourhood networks	Socially supported resilience
4	Limited formal employment	Combining several small sources of income	Economic diversification
5	Long-term dependence on PETI	Prioritizing children's education	Future-oriented resilience

The results demonstrate that women in Teluk Rendah occupied a complex position within the PETI economy. They experienced the consequences of irregular income, limited employment alternatives, insufficient savings, and repeated interruptions to mining activities, yet they also played a central role in preventing these pressures from immediately disrupting household life. Their responses ranged from reducing consumption and borrowing small amounts of money to operating microbusinesses and undertaking additional informal work.

The resilience observed in the field was nevertheless constrained. Most coping mechanisms were designed to manage immediate shortages rather than generate substantial long-term economic security. Small businesses depended on limited capital and local purchasing power, informal loans had to be repaid, and expenditure reduction could only be sustained to a certain point. Women's ability to keep households functioning therefore reflected considerable resourcefulness, but it also revealed how much of the responsibility for absorbing economic uncertainty had shifted into the household.

Taken together, the findings show a clear pattern: economic vulnerability emerged from dependence on unstable mining income and limited livelihood alternatives; adaptation occurred through diversification, careful household budgeting, and social networks; and resilience developed through women's capacity to reorganize resources, maintain household consumption, and pursue longer-term aspirations for their children. Women in the PETI area were therefore not only economically vulnerable actors. They were also central agents in maintaining household continuity under conditions of uncertainty, even though the strategies available to them remained constrained by the informal and unstable structure of the local economy.

DISCUSSION

The findings demonstrate that women's economic vulnerability in the unlicensed gold-mining area of Teluk Rendah cannot be understood simply as a condition of low household income. Vulnerability is produced by a wider economic structure in which household livelihoods depend heavily on an income source that is informal, irregular, and vulnerable to sudden interruption. Mining income rises and falls according to gold yields, operational conditions, and law-enforcement activities, while households have few stable employment alternatives to absorb these fluctuations. Women experience these pressures particularly closely because they are often responsible for translating uncertain income into food, education, health care, and other everyday household needs. Economic vulnerability in this context is therefore relational and structural: it emerges from the interaction between unstable employment, limited savings, weak access to formal protection, restricted livelihood alternatives, and women's continuing responsibility for household reproduction.

This finding is consistent with the broader literature on informal and artisanal mining. Lahiri-Dutt (2018) argues that informal mining should be understood within the livelihood systems surrounding extraction rather than solely as an extractive activity. People may remain involved in insecure and hazardous mining economies because other forms of livelihood are limited or provide insufficient returns. A similar pattern was evident in Teluk Rendah. Participants did not describe PETI merely as a preferred occupation; many described it as one of the few activities capable of generating relatively rapid cash income. The continuation of PETI therefore reflects more than individual economic choice. It is closely connected to the narrow structure of the rural economy and the absence of accessible alternatives capable of supporting household needs. This interpretation also helps explain why enforcement

activities may temporarily halt mining without necessarily eliminating household dependence on it. Once immediate enforcement pressure declines, economic necessity can draw workers back into the same livelihood system.

The gendered character of this vulnerability deserves particular attention. Women in this study were rarely positioned at the most visible or economically powerful points of the mining economy, yet their labour was essential to keeping mining households functioning. They managed consumption, operated small businesses, prepared food, participated in supporting mining activities, and generated additional income when mining earnings were interrupted. This pattern closely reflects Devi et al. (2024), who found that informal gold economies in Indonesia are shaped by gendered divisions of labour and unequal power relations across the gold value chain. Research by Arthur-Holmes et al. (2023) similarly shows that women construct direct, indirect, and temporary livelihoods around artisanal mining economies, including petty trading and home-based economic activities, while simultaneously experiencing distinct forms of social and economic vulnerability. The findings from Sarolangun extend this perspective by showing that women's indirect economic roles become especially important during periods when mining itself ceases to generate income.

Women's economic participation should therefore not automatically be interpreted as evidence that vulnerability has diminished. The small shops, food businesses, informal services, and occasional mining-related work identified in this study provided crucial supplementary income, but most operated with limited capital, restricted markets, and little formal protection. Such diversification helped households spread immediate economic risk, yet it rarely created sufficient independence from PETI. This distinction is important because livelihood diversification can have different meanings depending on the resources available to households. For women in Teluk Rendah, diversification was commonly undertaken as a response to economic pressure rather than as an expansion driven by accumulated assets or new market opportunities. The recent review by Buvinić & Furst-Nichols (2016) similarly emphasizes that women's participation in artisanal and small-scale mining economies must be examined alongside questions of occupational segregation, economic empowerment, livelihood sustainability, and access to resources. Women can exercise considerable economic agency while remaining constrained by the structure within which that agency operates.

Household expenditure management emerged as another important dimension of women's adaptation. When mining income declined, women reduced non-essential expenditure and prioritized food, schooling, and immediate household needs. On the surface, this practice may appear to be ordinary household budgeting. In an economically insecure setting, however, it represents a continuous process of deciding which needs can be maintained and which must be postponed. Women were therefore managing not only money but also the social consequences of income instability. Their decisions helped preserve household continuity during periods when cash was unavailable. This finding resonates with Buvinić & Furst-Nichols (2016) argument that women's economic vulnerability is closely related to their access to productive resources and their capacity to respond to shocks. The capacity to redistribute limited household resources can reduce the immediate consequences of a shock, but it does not necessarily increase the stock of resources available for the next crisis.

The use of family and neighbourhood networks adds another layer to this adaptive process. Informal borrowing, delayed payments to trusted shopkeepers, assistance from relatives, and reciprocal support among neighbours functioned as an informal safety net when households had little cash. These practices illustrate that resilience is not simply an individual quality possessed by particularly persistent women. It is produced through relationships. Walsh (2016) conceptualizes family resilience as a dynamic process involving the interaction of families with their social environment, while Ungar (2021) places resilience within a multisystemic framework in which adaptation depends on access to social, economic, relational, and institutional resources. The experience of women in Teluk Rendah supports this relational understanding. Their ability to manage periods of income loss depended partly on personal initiative, but also on whether relatives were willing to lend money, neighbours could offer assistance, suppliers were prepared to provide goods on credit, and household members could reorganize responsibilities.

Social capital, however, has clear limits as an economic protection mechanism. Informal networks can absorb relatively small and temporary shocks, but their protective capacity weakens when many members of the same community face hardship simultaneously. A prolonged interruption to PETI, widespread decline in mining yields, or a major household emergency could affect both borrowers and potential lenders. The same people who provide financial assistance are themselves embedded in the mining-dependent local economy. Community solidarity should therefore be recognized as a valuable source of

resilience without treating it as a substitute for formal social protection, accessible credit, or sustainable employment. This distinction is important for policy because an emphasis on the strength of local communities can unintentionally transfer responsibility for managing structural economic problems back onto households that already have limited resources.

The findings further suggest a meaningful distinction between adaptive or survival-oriented resilience and more transformative resilience. Women demonstrated a strong capacity to adjust expenditure, develop supplementary livelihoods, borrow through social networks, and reorganize household resources when circumstances changed. These strategies allowed families to continue functioning under considerable uncertainty. Yet most did not alter the conditions producing vulnerability in the first place. Ungar's (2021) multisystemic perspective is useful here because resilience involves not only adaptation to difficult circumstances but also the possibility of transformation when individuals and communities gain access to resources that change their exposure to adversity. The women in this study displayed considerable adaptive capacity, but access to larger productive capital, stable formal employment, social protection, broader markets, and strong women-centred economic institutions remained limited. Their resilience was therefore substantial at the level of everyday survival but constrained at the level of structural transformation.

The prioritization of children's education offers a different and more future-oriented dimension of resilience. Several women framed their present economic sacrifices around the expectation that education could provide their children with livelihood opportunities beyond mining. This orientation reveals that resilience was not limited to coping with the present. It also involved an intergenerational strategy aimed at reducing future dependence on an insecure economic system. Such decisions are especially meaningful because education remained protected even when households reduced other expenditure. From a family resilience perspective, this reflects the role of shared beliefs, future orientation, and purposeful household organization in responding to chronic adversity (Walsh, 2016). Education cannot by itself overcome the structural conditions of a mining-dependent rural economy, but women's commitment to their children's schooling indicates an aspiration toward a different livelihood trajectory rather than permanent accommodation to PETI.

The study contributes to the literature by bringing vulnerability, adaptation, and resilience into a single analytical relationship. Previous research on artisanal mining has frequently examined women's participation, occupational roles, livelihood opportunities, or

risks associated with mining. The Sarolangun findings show that these dimensions are better understood as part of an ongoing process. Irregular mining income creates vulnerability; women respond through expenditure management, diversification, informal finance, and social networks; these responses sustain household functioning and produce forms of resilience; yet the limited resources available to women prevent many of these adaptive practices from fundamentally changing the conditions that generated vulnerability. This pattern complicates any simple distinction between women as “victims” of mining economies and women as “resilient actors.” They are simultaneously exposed to economic risks and actively engaged in managing those risks. Recognizing both conditions provides a more human account of women’s economic lives without romanticizing their capacity to endure hardship.

The findings also have practical implications for policies addressing PETI. Strategies based primarily on prohibition and enforcement may overlook the livelihood relationships that have developed around mining. Reducing dependence on PETI requires viable economic alternatives rather than the removal of mining income alone. Women-centred livelihood programs could include accessible microenterprise capital, skills development connected to realistic local markets, support for food production and trading activities, cooperative business structures, and financial services designed for households with irregular earnings. Social protection is equally important because households with minimal savings are highly exposed when illness, accidents, or employment interruptions occur. Programs should recognize women not merely as dependents of male miners but as economic actors whose decisions directly affect household resilience. Supporting women’s productive capacity could therefore strengthen household security while gradually widening the range of livelihoods available outside PETI.

At the theoretical level, the findings support a view of resilience as a socially embedded and resource-dependent process rather than an individual personality trait. Women’s persistence, creativity, and willingness to work were important, but their capacity to adapt was shaped by the resources surrounding them. This interpretation is consistent with Walsh’s (2016) systemic approach and Ungar’s (2021) multisystemic perspective. Resilience in Teluk Rendah was strongest where women could combine personal agency with household cooperation, community trust, income-generating opportunities, and access to informal economic resources. The absence of stronger institutional resources explains why resilience frequently remained oriented toward maintaining existing household functioning

rather than creating substantial economic mobility. Policies that expect women simply to become “more resilient” without expanding their access to productive and institutional resources risk overlooking the structural origins of the vulnerability itself.

Several limitations should be considered when interpreting these findings. The study was conducted in Teluk Rendah Village and involved ten purposively selected informants, including three women identified as experiencing economic vulnerability. The qualitative design allowed for close examination of participants’ experiences, but the findings should not be generalized statistically to all women living in PETI areas of Sarolangun Regency or other mining regions. The sensitive and legally contested nature of unlicensed mining may also have influenced how openly participants discussed income, enforcement, and mining practices. Economic experiences were explored primarily through interviews, observation, and documentation rather than longitudinal household income records, meaning that changes in income and resilience over longer periods could not be measured directly. Future studies could involve women from several mining villages, follow households across different mining cycles, and combine qualitative accounts with household economic data. Such research would provide a broader understanding of when short-term adaptation develops into sustainable economic resilience and when households remain trapped in repeated cycles of vulnerability.

CONCLUSION

Based on the research findings and discussion, women living in the unlicensed gold-mining area of Teluk Rendah Village, Cerminan Gedang District, Sarolangun Regency experience considerable economic vulnerability. This vulnerability is reflected in unstable household income, heavy dependence on informal employment, limited access to social protection, and the scarcity of secure livelihood opportunities. The uncertainty of income generated from unlicensed gold mining places households at constant risk of economic disruption, particularly when mining activities decline or are temporarily halted. Women, however, do not remain passive in these circumstances. They respond by developing small-scale businesses, engaging in supplementary informal work, managing household expenditure carefully, and relying on family and community networks when income becomes insufficient. Their dual role as household managers and income contributors places them at the centre of family economic survival, although it also increases the physical, emotional, and economic pressures they must carry.

The findings further indicate that women's resilience in the PETI area is largely survival-oriented rather than transformative. Their adaptive strategies are effective in maintaining basic household needs and preventing immediate economic collapse, but they have not yet provided a stable pathway out of dependence on an insecure mining-based economy. Strengthening women's economic resilience therefore requires more than recognizing their capacity to endure hardship. Greater access to decent employment, social protection, skills development, microenterprise support, productive capital, and sustainable livelihood alternatives is needed so that adaptation can gradually develop into longer-term economic security. The study highlights the importance of gender-responsive policies that recognize women not only as members of mining households but also as economic actors whose decisions and labour sustain family life under conditions of uncertainty. Future research may extend this study across several PETI-affected communities and incorporate longitudinal household data to better understand how women's adaptive practices change over time and under different economic conditions.

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