Modeling The Food Security in Conflict-Affected Areas: Qualitative Evidence on Household Entitlements and Livelihoods in Kayin State, Myanmar

Nyan Linn Myint[1*], Veenarat Akaraputinat[1], Sayam Aroonsrimorakot[1], Kamalaporn Kanongdate[1], and Ratcha Chaichana[2]

[1]Faculty of Environment and Resource Studies, Mahidol University, Nakhon Pathom 73170, Thailand
[2]Faculty of Environment, Kasetsart University, Bangkok 10900, Thailand
**Corresponding Author E-mail:nyanlinn.myi@student.mahidol.edu*

ABSTRACT

Long-term armed conflict and climate variability are mutually reinforcing threats to fragile food systems. Kayin State, Myanmar, has experienced complex interacting environmental shocks and structures of political violence that have radically changed the character of its food system, from primarily a production deficit to failures of markets and entitlements. This qualitative study investigates the household-level determinants of food security under compounding climate vulnerability and active conflict. A qualitative research design was adopted, and primary data were collected using semi-structured interviews with people from 40 conflict-affected households, ensuring varied livelihood activities, food access pathways, market disruptions and entitlements failures, climate vulnerability, and resilience coping strategies. The data analysis followed an inductive thematic analysis of people's lived experiences of livelihoods, climate shocks, coping mechanisms, and the human dimension of food insecurity under prolonged conflict and environmental stress. Observations suggest that regional food insecurity is caused by a failure of economic entitlement, loss of buying power, and blockage of physical distribution, rather than an aggregate fall in agricultural supply. Climate factors such as high temperatures and inconsistent rainfall drastically affect subsistence agriculture and augment risk factors associated with conflict and household instability. To survive, communities deploy erosive coping strategies, including reducing meal frequencies, prioritizing children's nutrition, and liquidating key productive assets. Forest foraging acts as a safety net, but safe access is being limited by the proliferation of active mines. The development of sustainable food security in vulnerable climates and contexts will need to go beyond solely focusing on enhancing food production indicators and encompass strategies that protect trade corridors, promote drought-tolerant crops, ensure demand-side price stability, and enhance resilience.

Keywords: Food Security/ Conflict/ Climate Change/ Market Disruption/ Coping Strategies

1. INTRODUCTION

The world's food security is facing unprecedented pressure from climate variability, political unrest, and economic fluctuations, which create severe impacts and pressure on local food systems. Despite global commitment towards food production systems that are sustainable, healthy, and available to all [1], it is in vulnerable, fragile, conflict-affected environments that households face widespread structural shocks. In Myanmar, which is a victim of crisis politics, economic breakdown, mass displacement, and cumulative natural risks, over 16.7 million people are suffering from hunger and food insecurity. This complicated humanitarian environment is coupled with climatic shocks and limited humanitarian access to conflict corridors [2, 3]. Kayin State, situated along the southeast border with Thailand, serves as an acute microcosm of the "triple crisis." The three components of that triple crisis are prolonged civil war, climate vulnerability, and severe market isolation. Kayin State spans an area of 30,383 km^2, having a population estimated at around 1.57 million people [4]. The population in the state of Karen includes various ethnic groups. The region, home to an estimated 300,000 indigenous Karen communities primarily relying on rain-fed agriculture and natural resources from forests, is blighted by inherent and persistent structural vulnerabilities. Even before the current escalation, more than one third of children under five were reported to be stunted in Kayin State [5]. Decades of ongoing

conflict and the recent post-2021 conflict, land appropriations, village destructions, and landmines have resulted in the collapse of agricultural production and supply chains and the destruction of real household purchasing power [6, 7].

Although macro-level econometric and quantitative frameworks can suggest quantitative indicators for availability of foodstuffs, they generally ignore the qualitative and context-specific realities of vulnerable families experiencing active conflict. Traditional frameworks for food security often rely on functioning institutions and access to markets, creating a significant empirical research deficit in understanding the interplay of sustained conflict, climate shocks, and market blockade at the micro-level. At a conceptual level, this paper is based on Sen's Entitlement Approach [11] and Sustainable Livelihoods Frameworks [36, 37, 38], which capture the concept of household survival by constructing different types of livelihood portfolios, comprising combinations of assets, income-generating activities, and access strategies (used to mitigate risks and maintain well-being). This presents a significant empirical research deficit in understanding the interplay of sustained conflict, climate shocks, and market blockade at the micro-level and how it affects livelihoods, food access paths, and coping strategies of households. In order to fill this research gap, the qualitative component of this study focuses on exploring the lived experience of households in conflict-affected communities in Kayin State using a socio-behavioral perspective and the six objectives below;

- Livelihood Portfolios: Determine at the household level the diverse sources of income and how these are maintained or disrupted by different seasons and phases of conflict.
- Food Access Pathways: Evaluate the methods of acquiring food for households in isolated communities through localized markets, self-subsistence systems, informal border trading, and forest food acquisition and overall year-round sufficiency.
- Market Disruptions and Entitlement Failures: Analyze how road blockages, inflation, and trade chain collapses impair household purchasing power and market entitlement.
- Climate Variability Intersections: Investigate how climate shocks (erratic rainfall, extreme heat, drought) compound conflict-driven agricultural stresses.
- Resilience Coping Strategies: Document mechanisms of distress coping, informal support networks, access to forest products, and erosion of community thresholds of security.
- Demographic Vulnerabilities: Understand how dietary erosion specifically affects high-risk groups such as children, pregnant women, and older people.

  By elevating the significance of lived experiences from individual households in diverse district settings, this qualitative study will offer context-specific insights into how structural shocks impact human survival strategies in fragile, conflict-affected countries.

2. METHODOLOGY

2.1 Research Design, Sampling and Key Informants Categories

This qualitative study adopts a social-behavioral perspective to investigate household livelihoods, human elements of food insecurity, and their coping strategies in protracted conflict and climate stress. Semi-structured interviews were chosen as the primary data collection method, as these are able to accommodate the nuanced, sensitive lived experiences and specific food access barriers at the local level whilst maintaining a clear thematic approach.

Primary data on the contextual diversity were gathered in four administrative districts in Kayin State with a sample size of 40 and four respondents per district. The uniform sample size per district was meant to enable fair comparison of different profiles of conflict and markets across the districts and was expected to reduce sampling bias toward easier-to-access administrative centers. While sharing a common Karen ethnic heritage and exposure to regional instability, the four selected districts possess distinct socio-economic and logistical characteristics:

- Hpa-An: The state's administrative center, characterized by relatively stable market access and lower direct conflict intensity.
- Myawaddy: A vital border trade hub, heavily reliant on cross-border commerce and commodity flows from Thailand.
- Kawkareik: A mixed urban-rural agricultural corridor subject to frequent active conflict and supply chain bottlenecks.
- Hpapun: A remote, heavily conflict-affected district marked by severe physical isolation, active combat, and high reliance on forest subsistence.

Participants were selected using purposive sampling based on qualitative descriptive principles aiming for information richness and thematic saturation rather than statistical representativeness. Across all four districts, key informants were uniformly selected across four primary socio-economic categories ($n = 10$ per district): community leaders and local decision-makers, smallholder farmers and agricultural workers, small business owners and market traders, and casual wage laborers.

2.2 Data Collection and Analysis

Semi-structured interviews were conducted using non-sensitive qualitative protocols focusing on household income sources, market disruptions, climate impacts, diet changes, and coping responses. All recorded data, along with interviewees' speech notes, were translated and transcribed word by word. For the analysis, an inductive thematic analysis approach was adopted following a coding process from scratch that iteratively generated recurring patterns, points of stress, and safety net strategies. The analysis followed existing guidelines for qualitative research on the assessment of food security under conditions of fragility and conflict [8, 9, 10].

3. RESULTS AND DISCUSSION

3.1 Results

The analysis in this chapter presents results from a qualitative study carried out with conflict-affected households across four districts within Karen State, Myanmar. Through the use of semi-structured interviews with 40 respondents (coded R01-R40), four thematic analyses of interview data were conducted, and a wide range of occupations were represented in the study, including: farmers (n=12), wage laborers (n=8), community leaders (n=8), small business owners (n=4), small merchants (n=4), and agricultural laborers (n=4). The demographic and financial metrics presented in Figures (1) and (2) establish the essential socioeconomic baseline and vulnerability context required to interpret the qualitative findings in subsequent themes.

As shown in Figure 1, in terms of both income (average 901,250 MMK per month) and expenditure (average 747,500 MMK), the economic structure of all 40 households indicated on average very narrow margins, which would imply that households, on average, have little capital buffers or savings to buffer the effects of compounded climate or conflict shocks. This structure also directly indicates why households might not take long to resort to distress coping strategies such as taking on debt, selling productive assets, and skipping meals in the context of market shocks and crop failures.

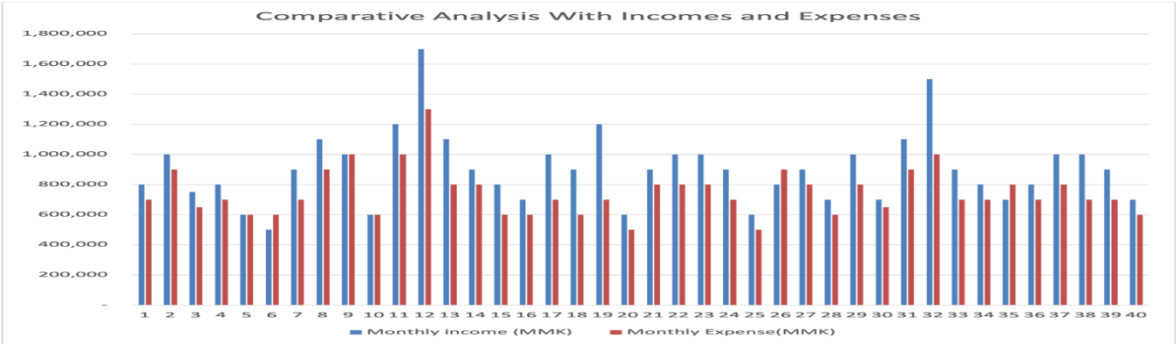

Figure 1. Comparative Analysis of Monthly Incomes and Expenses per Household
Note: The horizontal axis (X-axis) denotes individual survey respondents/households (N=40), while the vertical axis (Y-axis) measures monetary values in Myanmar Kyat (MMK) for both monthly income (blue) and monthly expense (red).

Likewise, the demographic information in Figure 2 provides a vital background picture in relation to work availability and decision-making within the household. The majority of the sample falls within the most active working age group, with 62.5% of the participants aged 30-49 years. Therefore, the failure of entitlement and livelihood shocks may be directly felt by household wage earners rather than non-working groups. Additionally, capturing perspectives across both male (62%) and female (38%) respondents ensures that the qualitative analysis accounts for gendered divisions of labor, including women's specific strategies regarding meal rationing, caregiving, and nutritional prioritization for children and the elderly under severe food scarcity.

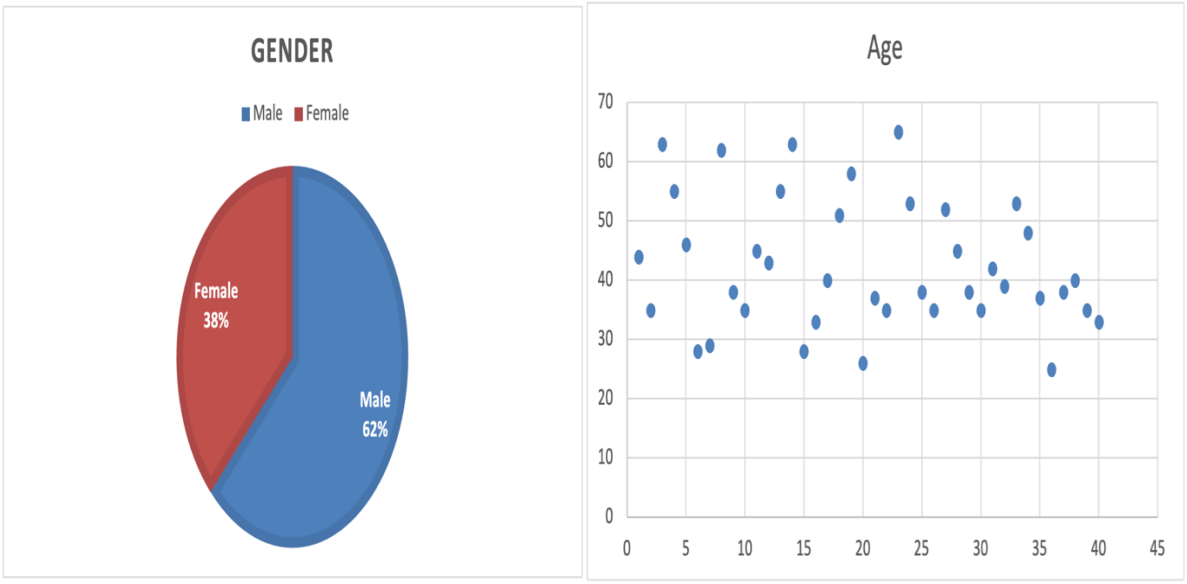

Figure 2. Demographic Profile of Respondents (Gender and Age Distribution)
**Note: The left panel (pie chart) displays the percentage distribution of respondents by gender (62% Male, 38% Female). The right panel (scatter plot) depicts respondent ages, where the X-axis represents individual Respondent ID (N=40) and the Y-axis represents Age in years.

Results of livelihood portfolios of the respondents suggest that agriculture remains a "hard anchor of sustenance and economic security" in the research site, primarily due to smallholder production of crops and animal husbandry with emphasis on poultry, piggery, and cattle, usually followed by seasonal vegetable growing. The overwhelming dependence on agriculture, however, is complemented by other sources of off-farm income such as casual labor, small business, street vending, etc. Being the major survival strategies or alternative back-up strategies to tackle pervasive systemic instability. In effect,

livelihood diversification proved to be the paramount structural feature in this sample, where only a minority of 19% relied on a single livelihood source while 81% of households used multiple livelihood sources to support their livelihoods.

Four general themes were derived from the analysis: (1) Conflict and structural drivers of food insecurity; (2) Climate change and vulnerability of livelihood; (3) Access to food, diversity of diet and nutritional insecurity; (4) Coping strategies, adaptation and resilience of the community. Below each theme and sub-theme are the findings and illustrations of responses from respondents (in direct quotations), displaying the whole themes, sub-themes, and illustrative key quotations in the data set.

Table 1. Summary of Themes, Sub-themes, Supporting Respondents, and Illustrative Quotes

Theme / Sub-theme	Supporting Respondents	Illustrative Quote
Theme 1: Conflict and Structural Drivers of Food Insecurity		
Conflict disrupting livelihoods, farming, and employment	R01, R03, R05, R06, R08, R13, R20	"Due to ongoing conflicts and fighting, the situation on the ground is unstable, making it difficult to expand our economic activities." (R01)
Forced displacement and insecurity affecting food access	R01, R08, R15, R25	"It becomes very difficult when we face conflict and are forced to migrate to other places." (R08)
Disruption of supply chains, transportation, and markets	R02, R09, R11, R12, R19, R21, R24	"Conflict has disrupted the entire value and supply chain, leading to price fluctuations, rising inflation, and increased dependence on food and products from Thailand." (R11)
Rising food prices and increased cost of living	R09, R14, R15, R17, R22, R28	"Food prices and the overall cost of living have increased to more than three times their levels before the coup." (R09)
Need for political stability and good governance	R03, R08, R16, R21, R23, R40	"A stable political situation, along with strong leadership and good governance, is essential for improving food security in our community." (R03)
Theme 2: Climate Change and Livelihood Vulnerability		
Increasing heat and irregular rainfall patterns	R01, R05, R07, R08, R21, R22, R35	"Summers are now much hotter, and winters are no longer as cold as before." (R22)
Unpredictable weather affecting agriculture	R03, R04, R18, R27, R31	"Rainfall patterns have become increasingly irregular and unpredictable." (R21)
Crop failure, pests, and livestock disease linked to climate change	R03, R04, R08, R17, R18, R29	"Crops are suffering from dieback, as well as increased pests and diseases, while livestock are dying due to heat stress." (R03)
Water shortages and declining irrigation access	R07, R13, R15, R30, R33	"Water levels in nearby streams have been decreasing over time." (R07)
Seasonal and unstable livelihoods during dry season	R05, R06, R10, R15, R16, R20	"It is particularly challenging during the dry season when work opportunities are limited." (R06)
Diversification as a strategy to reduce vulnerability	R09, R11, R14, R24, R28	"Relying on a single source is fragile due to conflict and unstable political conditions." (R11)
Theme 3: Food Access, Dietary Diversity, and Nutritional Insecurity		
Reliance on own farms for food access	R03, R07, R08, R09, R14, R18	"Our household mainly obtains food from our own farm." (R03)
Dependence on markets and cross-border trade	R01, R02, R11, R12, R34	"Our household usually gets food from the market." (R01)
Forests as supplementary food sources	R10, R13, R16, R20, R36	"We go to the forest to collect seasonal vegetables and meat such as fish and wild boar." (R16)

Table 1. Summary of Themes, Sub-themes, Supporting Respondents, and Illustrative Quotes (cont.)

Theme / Sub-theme	Supporting Respondents	Illustrative Quote
Seasonal food shortages during dry season	R05, R06, R10, R15, R16, R30	"Food shortages frequently occur during the dry season from February to May." (R10)
Declining dietary diversity and reduced meal frequency	R04, R14, R15, R17, R24, R27	"We have reduced both the quantity of food and the number of meals." (R04)
Children, pregnant women, and elderly as most vulnerable	R10, R17, R22, R32	"Children are mostly impacted in getting nutritious food." (R10)
Theme 4: Coping, Adaptation, and Community Resilience		
Borrowing money and reducing food consumption	R01, R06, R07, R11, R15, R24	"We cope by borrowing money and reducing both the quantity and variety of food we consume." (R01)
Selling assets and livestock as coping strategies	R03, R08, R18, R19, R22	"Selling livestock is harmful in the long term, as it reduces our future income." (R03)
Forest dependence as a safety net during food shortages	R10, R13, R16, R20, R36	"Forests serve as a crucial food source during periods of scarcity." (R20)
Food preservation and indigenous coping practices	R05, R21, R25, R37	"We preserve dried bamboo shoots and vegetables." (R25)
Community solidarity through food sharing and mutual support	R04, R06, R15, R21, R38	"The community provides support through food sharing and donations." (R06)
NGO/CSO support: food baskets, training, cash-for-work	R09, R27, R28, R39, R40	"This support is very important for meeting our basic needs." (R27)
Limited or absent external support	R04, R05, R07, R11, R22, R29	"We are not getting any support." (R07)

Note. The Respondent Codes (R01 to R40) are identifiers that have been anonymized to represent different interview participants. The quotes are given verbatim to ensure that the respondents' own voice and perspectives are conveyed.

3.1.1 Theme 1: Conflict and Structural Drivers of Food Insecurity

The most universally and strongly cited structural factor of household livelihood and food system security deprivation across all four communities was the role of long-term armed conflict in shaping livelihood and food security conditions. In all four sites, interviewees described how the presence of ongoing armed conflict created conditions that prevented agricultural production, limited the flow of transport, disrupted market functioning, increased food and living costs, and increased displacement, creating an interacting system that dramatically limited household food security.

3.1.1.1 Conflict, Displacement, and Livelihood Disruption

All respondents across the communities revealed that their access to and sustainability of livelihoods has been directly and severely hampered by conflict and security concerns. In all the sampled communities, agricultural work, wage earning, small business activities, and movement were all impeded or altogether halted by the reality of, or threat of, violence and conflict. According to R01, the general insecurity has almost halted small businesses and restricted people to fewer employment opportunities:

> *"Due to ongoing conflicts and fighting, the situation on the ground is unstable, making it difficult to expand our economic activities."* **(R01)**

Multiple respondents also mentioned this and corroboration. R05 stated that he was formerly working as a building contractor but has given it up for temporary unskilled labor jobs owing to insecurity. R06 noted that his family was prevented by conflict from being able to work and get food.

Respondents R03, R07, R18, and R26 all similarly related instances of insecurity, displacement, or work limitations that prevent them from undertaking agricultural work at specific stages such as planting in agricultural periods; crops were not planted and harvested, and spoiled. Respondents noted that displacement caused severe interruptions: R05, R06, R07, and R18, all reported going into hiding in the forest or displacement camps when the airstrikes and active conflict occurred.

> *"It becomes very difficult when we face conflict and are forced to migrate to other places."* **(R08)**

R01, R15, and R25 reported similar experiences of short-term displacements, which disrupt planting and harvesting calendars, prevent access to markets, and draw down the food stocks of the household. R20 depicted conflict as a serious and multi-faceted threat to food, but to every dimension of livelihood security (physical, psychological, and economic).

3.1.1.2 Market Disruption, Supply Chain Breakdown, and Inflation

It was unanimously stated by the respondents that the conflict disrupted local and regional market systems drastically. The market systems faced a lack of supply, transport disruptions, and considerable price hikes due to conflict. It was argued that the closure of major roads linking border trade areas to rural markets was "devastating".

> *"Conflict has disrupted the entire value and supply chain, leading to price fluctuations, rising inflation, and increased dependence on food and products from Thailand."* **(R11)**

R02, R12, R19, R21, and R24 also corroborated statements on disrupted trade, unpredictable transport, and increasing food unavailability and prices. Increasing food prices (along with overall costs) were one of the most reported effects in the dataset.

> *"Food prices and the overall cost of living have increased to more than three times their levels before the coup."* **(R09)**

R14, R15, R17, R22, and R28 likewise stated that severe imbalances were generated between income and the necessity of consumption through inflation. Agriculture input costs have risen dramatically, which include fertilizers, pesticides, and transport, consequently both agriculture output and household income are more limited. R04, R09 and R31 both mentioned that they are finding input costs are rising each year making farming a less economic venture, both expressed that transport routes have to remain open for the food system to return to normal and for the markets to work again.

> *"The Myawaddy-Asia main roads should remain open to ensure proper food access and strengthen food security."* **(R02)**

This point was supported by R11, R12, R20, and R24, which also emphasized the reliance of rural areas on viable transport corridors and cross-border trading routes from Thailand for the provision of food. The evidence collectively showed that disruption of markets through conflict is a structural economic destabilization that systematically destroys households' purchasing power and access to food.

3.1.1.3 Governance Deficits and the Need for Political Stability

A recurring sub-theme that surfaced throughout all of the interviews with respondents was a clear and explicit relationship between poor governance, political instability, and food security. The perception of the respondents about achieving a real and sustained increase in livelihood and food security was clear and consistent. It hinges on the stability of the political system and effective governance.

"A stable political situation, along with strong leadership and good governance, is essential for improving food security in our community." **(R03)**

Responses from R08, R16, R21, R23, and R40 presented similar attitudes, saying that peace and political stability are a prerequisite to economic recovery, restoration of livelihoods, and decreased food insecurity. It was observed that some respondents linked conflict resolution with the recovery of the food systems directly.

"If the political situation becomes stable, livelihoods and food security will also become more stable." **(R16)**

R01, R14, R18, and R39 shared essentially the same point: prospects of future food security depend on peacebuilding and political reforms. These comments illustrate a definite understanding of the respondents: food insecurity in Karen State is not a technical/agronomic issue but is intrinsically a political issue.

3.1.2 Theme 2: Climate Change and Livelihood Vulnerability

The second dominant theme to arise out of the data revolves around climatic variability and environmental change effects on household livelihood and food security. The majority of those surveyed could readily identify the manner in which climate patterns have altered, and continue to change over the last 10 years, and have deteriorated (rising temperatures, unstable/erratic, unpredictable rain patterns, floods, drought, stress on agricultural and natural environments).

3.1.2.1 Increasing Climate Variability and Environmental Stress

Respondents from all communities described significant changes in their local seasonal climate over the last few decades. The most common descriptions related to increases in temperature and variability in precipitation.

"Summers are now much hotter, and winters are no longer as cold as before." **(R22)**

Similar comments were noted from R01, R05, R07, R08 and R35. They referred to periods between rain falling over longer durations; occurrence of more drastic heat waves and variation in the regularity of seasons. Descriptions by R21, R03, R04, R18, R27, R31 mention a delayed onset of the monsoon, fewer rain days, and sudden heavy rain, changing seasonal rhythms. R07 commented on the water level of local streams becoming lower with increasing age and water availability in the longer term.

"Water levels in nearby streams have been decreasing over time." **(R07)**

According to R13, the illicit forest operations and mining practices in upland regions were accountable for water shortage and soil erosion. Road networks were damaged because of landslides and floods, which caused food supply difficulty to remote village said by R02 and R11. These accounts collectively demonstrate a widespread and increasing trend in environmental changes at the investigated community.

3.1.2.2 Impacts on Agricultural Production and Livestock

There was general acknowledgment that the systems for agricultural production and livestock are highly exposed to stresses arising from climate change. Problems like decreases in crop yields and increases in pests and diseases, along with livestock, have been noted by several sources.

"Crops are suffering from dieback, as well as increased pests and diseases, while livestock are dying due to heat stress." **(R03)**

Evidence from R04, R08, R17, R18, and R29 confirmed descriptions of diminished yields, crop disease, sick animals, and generally declining agricultural productivity. In many villages surveyed, a key aspect of declining production was described as variability of the rains. Respondents like R25 referred to the delayed monsoon and the absence of a sufficient number of rainy days that "makes farming patterns fall apart". R07, R14, R21, and R35 also describe interrupted planting and harvesting cycles due to irregular patterns of rainfall. R04 stated, "it has caused reduced rice yield and increased crop vulnerability to pests." Such patterns suggest widespread climate-based agricultural deterioration in conjunction with conflict-based disruptions.

3.1.2.3 Seasonal Livelihood Insecurity and Diversification Responses

Seasonality had a marked impact on patterns of livelihood for all the studied communities. Respondents claimed that access to employment and income was greatly reduced during the dry season, resulting in regular and recurring periods of increased vulnerability

> *"It is particularly challenging during the dry season when work opportunities are limited."* **(R06)**

The respondents R05, R10, R15, R16 and R20 documented limited access to employment, income, and food during the dry season, reinforcing a seasonal cycle of food insecurity that while predictable, was harder to resolve in the given context. Single-livelihood households emerged as vulnerable to seasonal shocks, and R11 captured a commonly held understanding of the dangers of reliance on single livelihood streams:

> *"Relying on a single source is fragile due to conflict and unstable political conditions."* **(R11)**

R09, R14, R24, R28 also pointed to livelihood diversification as the key measure in mitigating climate and conflict shocks. Households had been engaged in varying extents of diversification, encompassing farming, wage employment, petty trading, collection of forest products, and migration.

3.1.3 Theme 3: Food Access, Dietary Diversity, and Nutritional Insecurity

Third, data concern the patterns of household food access, and the resource base to which it relies; diets consumed and their nutritional value and adequacy, and the forms of nutritional insecurity found among the most vulnerable household members.

3.1.3.1 Food Access Pathways and Sources

In respondents' accounts, there is a range (although with narrowed options) of access mechanisms to food: own-farm production, market buying (local or cross-border markets), collecting forest food. Most families' food supply comes from growing their own food, and purchasing from the market for other foods.

> *"Our household mainly obtains food from our own farm."* **(R03)**

The five households (R07, R08, R09, R14, R18) have said that they have a similar situation as well, and that is the mixture of producing their own crops and buying some of the products from the market system. The majority of other households used the market system. Most of them did not possess their own farmland and could not provide a considerable proportion of products, so those households took advantage of the market system and trans border market networks.

> *"Our household usually gets food from the market."* **(R01)**

With regards to R02, R11, R12 and R34, the markets and cross-border trading systems were explained as a way of reaching food sources; hence they were the most susceptible to shocks (caused by conflict), such as disruption of supplies and increases in prices. Forest resources were also cited as a major food access pathway, especially during times of severe food shortage.

"We go to the forest to collect seasonal vegetables and meat such as mushrooms, bamboo shoot, fish and wild boar." **(R16)**

Similarly, R10, R13, R20, and R36 reported increased reliance on forest products as a safety net and getting nutrient diversity from the forest in the event of food scarcity and falling incomes. However, reliance on forest resources was said to be diminishing with the increasing presence of conflict, landmines, deforestation, and degradation. R07 stated they are afraid of gathering forest foods as they did not feel safe traveling there because of the conflict. Higher-income households living in areas close to the border of Thailand had access to various imported foods, but they also suffered during the border closures under the conditions of the conflict.

3.1.3.2 Seasonal Food Insecurity and Access Constraints

The number of months in which the household's access to food was somewhat reliable varied, and in most cases it was the dry months of Feb-May and periods of active conflict that had substantial food gaps.

"Food shortages frequently occur during the dry season from February to May." **(R10)**

R05, R06, R15, R16 and R30 all mentioned chronic seasonal food shortage in dry months. They also associated this insecurity of food access with diminished agricultural productivity, reduced potential for non-agricultural employment, and declining availability of forest foods. Besides the constraint that the road closures have imposed on food accessibility in general terms, difficulty in the transportation of food was caused to the food insecure by the conflict.

"Road closures and conflict make it difficult to access enough food." **(R11)**

All had very similar reports on transport restrictions (access to food & prices as a result of conflict, road closure, landslides, flooding) R01, R02, R20, R21 and R35.

3.1.3.3 Declining Dietary Diversity, Meal Reduction, and Nutritional Vulnerability

One of the most disturbing and recurring trends observed across the dataset was the substantial decline in dietary diversity, meal frequency and quality from February 2021 coup onwards. Higher food prices, lower incomes and food supply shortages were the main transmission channels of this worsening situation.

"We have reduced both the quantity of food and the number of meals, and it has become rare for our household to consume fresh fruits and milk." **(R04)**

R14, R15, R17, R24, R27 reinforced this trend. It was indicated that the frequency of eating, size of portions, quality of food and range of diet had decreased. R14 specifically identified a gradual shift toward foods of lower and lower quality, which were more nutritious relative to the diet prior to the coup. R15 illustrated the decline from three to two meals a day during periods of greatest scarcity. Access to nutritious foods (e.g., fresh fruits, vegetables, milk, cheese, meat) declined significantly.

Children, pregnant women, and elderly people can be identified as nutritionally vulnerable in the vulnerable households recognized. R10 claimed that children were especially deprived of both nutritious foods and dietary supplements. R17 noticed increasingly poor nutritional conditions in pregnant women as the quantity and variety of food declined within the household. R01 and R32 raised particular concerns over the lack of facilities to accommodate the nutritional needs of the elderly and children while maintaining the food quantities.

"Children are mostly impacted in getting nutritious food." **(R10)**

Combined, the items under this theme illustrate a scenario in which the food insecurity in study sites is not defined solely by a quantitative deficit in the amount of food consumed, but also a qualitative deficit; i.e., poor diet diversity and density, multi-dimensional nutritional insecurity among study households at all sites.

3.1.4 Theme 4: Coping, Adaptation, and Community Resilience

Theme four identifies coping and adaptation strategies used by households in the face of food insecurity, income shocks, and unstable livelihoods, and explores the importance of community solidarity and external aid in supporting household resilience in prolonged crises.

3.1.4.1 Financial Coping Strategies: Borrowing, Asset Sales, and Consumption Reduction

The coping strategies used by the respondents to tackle food insecurity and cash crises in their households are varied; they include borrowing from relatives and friends, neighbors, and borrowing from financial institutions like microfinance institutions and from private moneylenders, which is the most used strategy.

> *"We cope by borrowing money and reducing both the quantity and variety of food we consume."* **(R01)**

R06, R07, R11, R15, and R24 all reported a similar practice of borrowing money and thus consuming less during an economic crisis. They did realize that borrowing money from informal sources (and thus often with high interest) was not a permanent solution and that borrowing made debt levels grow and hinder financial resilience in the future. R07 was afraid that the debt would grow and make things worse in the future.:

> *"We are worried that we may not be able to repay the debts."* **(R07)**

The sale of income-producing assets such as livestock, land, money saved, and consumer goods was the next most commonly reported coping strategy during prolonged periods of income poverty. Respondents themselves understood that the sale of productive assets comes at a cost in terms of future livelihoods.

> *"Selling livestock is harmful in the long term, as it reduces our future income and livelihood assets."* **(R03)**

R08, R18, R19, and R22 confirmed this assertion by stating the selling off of assets to make sure the family survives at a time of little income and also acknowledging a negative implication to the long-term capacity to produce. Reduction in the variety or quantity of food was the other strategy identified as used in times of crises. R15 said he resorted to eating twice a day from thrice during peak shortage periods. R16 indicated that the household assets which are durable and which are set aside are consumed during crisis periods. The consumption reduction strategies discussed above, although they are to keep the household going, are recognized by the respondent as a reduction in intake leading to nutritional deficiencies.

3.1.4.2 Forest Dependence and Indigenous Resilience Practices

Forest resources were repeatedly characterized as an important informal safety net during times of food shortage or income deprivation. All interviewees acknowledged the use of forest resources (wild vegetables, bamboo shoots, fish, honey, wild animals/meat, medicinal herbs, roots) for consumption, or as a source of income at critical times.

> *"Forests serve as a crucial food source during periods of scarcity."* **(R20)**

Similarly, R10, R13, R16, and R36 also identified their dependence on forest products as a strategy for food buffering during times of food shortage resulting from reduction of cash income, as

well as displacement due to conflict. Native methods of food preservation, such as pickling and drying of seasonal vegetables and bamboo, are a significant strategy for food buffering during food sovereignty.

"We preserve dried bamboo shoots and vegetables." **(R25)**

R05, R21, and R37 reported similar food conservation strategies as ways to buffer seasonality. However, they indicated that access to forest resources was decreasing progressively due to conflict, mines, deforestation, and land degradation. R16, R13, R20, R33 and R36 stated that access to forest food was more problematic and was found at more remote locations than previously, indicating that access to this vital informal coping resource was dwindling.

3.1.4.3 Community Social Networks and External Humanitarian Support

Social solidarity mechanisms at the community level were recognized as a resource in times of crisis. Respondents cited practices such as food sharing, reciprocal assistance, community giving, and community and neighborly solidarity.

"The community provides support through food sharing and donations." **(R06)**

R04, R15, R21 and R38 described similar community-based solidarity activities such as support to the poor and the elderly in the community during festivals and times of acute distress. This shows that social networks were considered to be an important (though often informal) resource for household resilience. NGOs, CSOs, and local governing bodies were reported by some respondents to have provided humanitarian assistance such as cash-for-work programs, food aid packages, agricultural training, better seeds, and irrigation support. Those interviewed felt this external assistance, when available, was beneficial.

"This support is very important for meeting our basic needs and accessing nutritious food." **(R27)**

R09, R28, R39, and R40 indicated how support of certain types, such as support for climate-resilient farming, seeds, and support in irrigation, made a tangible difference to their farming and hence their food security. However, most of the interviewees received very little external support or no support at all.

"We are not getting any support." **(R07)**

R04, R05, R11, R22, and R29 all reported a lack or insufficient institutional support and explicitly connected it to higher levels of food insecurity and livelihood vulnerability. The communities agreed and advocated for clearer, longer term structural supports beyond immediate relief measures: ending the conflict, political stability, infrastructural investment, support to agriculture (with resilience to climate change), greater access to markets and employment opportunities.

3.1.5 Summary of Qualitative Findings

Overall, the evidence in this chapter indicates that a multifaceted, causal pattern characterizes food insecurity and livelihood vulnerability among conflict-affected households in Karen State. In each of the four communities studied, the structural cause of food insecurity was persistent, prolonged armed conflict, which triggered food insecurity mostly by affecting the transport and market systems, jobs and employment, agricultural production, and displacement. Climate variability compounded the stresses on agriculture and household livelihood security, which were already compromised by conflict. Dietary diversity, the frequency of meals consumed, and the nutritional quality of diets deteriorated significantly in households across the entire dataset. The worst victims of increased food insecurity were children and other susceptible groups, such as the elderly and pregnant women.

In the face of these multiple stresses, households used multiple coping strategies such as loans, sale of assets, reduction in food consumption, resource use from the forest, and community self-support, which could only alleviate their hardship in the short run and were acknowledged as 'unsustainable' in long-term crisis. Support from outside NGOs and CSOs was insufficient and unevenly spread. Political stability, solution of conflict, rehabilitation of infrastructure, and climate-smart agriculture were identified by respondents as essential prerequisites of sustainable food security and livelihood recovery.

3.2 DISCUSSIONS

3.2.1 Discussion of Household Food Availability and Entitlements

The qualitative results of the research illustrate that the 'food security' situation in conflict regions is far more complex and cannot be determined simply through measuring aggregate food production or the geographical space available for agricultural activities. In areas that have natural land resources, availability of food is highly limited due to structural disarrangements. It is also a matter of physical restriction through armed conflict, hostilities, and the danger posed by mines [12] from household members reaching their fields. As observed by R03, households often lose crops as a result of moving out while it is their cultivation season. Additionally, supply chain disruptions and road blockages in main trade routes such as the (Myawaddy-Asia Highway) hinder in transferring food items from surplus regions to shortage regions [13, 14]. Therefore, food security at the level of the local market does not seem guaranteed and depends on expensive imported items from Thailand [11, 13].

This study also suggests the importance of institutions and social safety nets in protecting vulnerable households against the effects of food insecurity. Some respondents also noted access to informal support from CSOs and NGOs, but the reach of such initiatives remains a challenge and remains insufficient. However, the scope and extent of civil society activities do not address the immediate needs of crisis households, since formal social safety nets are mostly nonexistent in many contexts of conflict and protracted crises.

The lack of reliable institutional support exacerbates household vulnerability, forcing families to resort to negative coping mechanisms such as selling productive assets or reducing food consumption [15, 16]. Spatial food market models confirm that active conflict zones suffer from severe entitlement failures rather than simple aggregate production shortfalls [11, 17]. This absence of reliable institutional support leaves households very vulnerable, forcing them to adopt perverse coping strategies including the sale of productive assets and reduced calorie consumption [15,16]. Evidence from spatial food market studies shows entitlement failures in conflict zones are much more extreme than any likely aggregate production shortage [11, 17].

3.2.2 Discussion of Climatic Factors Affecting Food Security

Climate variability has an exacerbating influence and is indeed becoming a strong stressor upon household food security in addition to the problem of ongoing internal displacement and conflict in Kayin State. These temperature fluctuations, along with changes to the rainfall amounts, also have implications for the output of farming and the availability of natural resources in nature. Rising temperatures, unpredictable precipitation, and long dry periods cause crop failure, water scarcity, and diminishing yields of food crops [20, 21, 22]. The climatic consequences described above have a major impact on rainfed agriculture, that are critical for the sustenance of most of the households in rural areas that were studied.

The qualitative data indicate that the perceived severity of the climate change crisis grows and that it becomes unpredictable and disruptive for the households involved. In the farmers' responses, it is reported that inconsistent and unpredictable rainy patterns make it harder for farmers to plant and harvest crops, and extreme heat negatively impacts livestock health and crops [18,19]. The dwindling of traditional ecological knowledge along with minimal access to contemporary farming methods and climate-resilient crop varieties make farming households severely susceptible to the impact of climate risks [18]. Under peaceful and stable conditions, rural farmers compensate for such shocks through

adaptation strategies by altering their planting time and using micro-irrigation technologies [22], whereas the prolonged conflict severely compromises smallholder adaptive abilities [23, 24].

3.2.3 Discussion of Conflict-Related Disruptions and Food Security

Armed conflict constitutes the major underlying factor behind food insecurity within the context of Kayin State. This operates at several different levels and through various interacting mechanisms. Some direct effects include destruction of farming inputs, forced removal of farming populations, limitations on movement, and land mines due to armed activities [12, 25]. These disruptions seriously undermine household food production and income generation capacity, causing severe shortages and food insecurity and instability for household members. The unintended consequences of conflict are just as catastrophic, impacting market functioning, price stability, and the availability of economic opportunities. The existence of conflict-linked disruptions in the supply chain resulted in massive hikes and volatile price movements, especially when it comes to necessities such as agricultural inputs and foodstuffs [13, 26].

Households' purchasing power decreases due to the loss of livelihoods. There is a necessity for making hard decisions where households between food and non-food items are to be substituted, thereby imposing huge constraints on households [11]. It was also recognized that conflict-related displacement results in loss of assets and social networks, making the population dependent on external aid interventions [25, 27]. Overall, these results confirm both the "conflict trap" principle suggested by Collier et al. [28] and the idea that de-escalation of security threats should be a prerequisite for sustainable restoration of food systems [29, 30]. Three main syntheses of findings are following;

- Entitlement Failure: The purchasing power, effectiveness of transport corridors, and market access are far more dominant factors of food security for households than aggregate yield [11, 14, 17].
- Nutritional Utilization: The market failure pushed the families towards consuming low-priced starches over food that contains richer nutrients and thus increasing hidden hunger in children and pregnant women [31, 32].
- Forest Safety Nets: Forests and non-timber forest products provide a vital informal coping mechanism [33, 34]; however, safe access is progressively hampered as a result of the problem of landmine contamination [33, 35].

3.2.4 Policy Implications

a) Prioritize Political Stabilization: Political stability is fundamental for any rebound to happen. It requires the de-escalation of conflict before considering programmes of long term agricultural development [28, 29].

b) Market Interventions: Ensure protection of transit routes for the commercial transport corridor (Myawaddy-Asia Highway) and extend cash/voucher support to maintain purchasing capacity [11, 13, 16].

c) Climate Adaptation & Asset Protection: Encourage the cultivation of drought-resilient, short-duration varieties of crops, provide the technology for micro-irrigation, an early warning system, and grants for protection of assets [18, 20].

d) Nutritional & Environmental Governance: Delivering the right nutritional aid (feed at risk) to vulnerable communities, while also safeguarding forest community safety nets through integrated natural resource governance mechanisms [32,34,35].

3.2.5 Limitations & Future Research

Access for fieldwork was limited in highly volatile settings, raising the potential for recall and coverage bias. Future studies ought to use high-frequency panel surveys for longitudinal micro-level household monitoring to document changing levels of household resilience, make gender and cross-border analyses of flows of migration and remittances between Thailand and countries to the east, and collect more direct indicators of nutrition, including intake of micronutrients and physiological markers, in order to provide a more comprehensive picture of the structural burden of this "hidden hunger."

4. CONCLUSIONS

In conflict-affected areas of Kayin State, Myanmar, food insecurity is more than an aggregate deficit of crop production, primarily rooted in the collapse of entitlements and market failure. While armed conflict ruptures the physical market supply chains of commodity food, climate variability renders agriculture a risk-prone sector in the absence of formal institutions. While the protection offered by forest buffers and community-based social networks is instrumental for short-term survival, the erosion of these resource systems by conflict and pollution renders such mechanisms unsustainable.

Beyond short-term crisis response to climate shocks, building long-term climate change resilience in protracted conflict environments needs a paradigm shift away from crisis-focused responses to a proactive approach to adaptation. Building systemic resilience cannot be based on supply-side production goals alone, it requires a mix of political de-escalation and market-transiting measures with demand-side safety nets, complemented by climate-sensitive agricultural solutions like crop diversification, irrigated agriculture, and community forest management. Safeguard measures that protect both physical security and ecological capital are essential prerequisites for empowering vulnerable households to transition from fragile distress coping to durable, long-term climate adaptation.

Acknowledgement

The authors acknowledge the Embassy of Norway in Myanmar for providing financial support through the Human Capital Empowerment in Myanmar (HCEM) scholarship program. Special thanks are given to the Faculty of Environment and Resource Studies, Mahidol University, for kind support, the necessary resource facilities, and institutional support in completing this research.

References

[1] Food and Agriculture Organization. (2019). *The state of food security and nutrition in the world 2019*. Food and Agriculture Organization of the United Nations.
[2] Germanwatch. (2021). *Global climate risk index 2021*. Germanwatch.
[3] United Nations Office for the Coordination of Humanitarian Affairs. (2024). *Myanmar humanitarian needs and response plan 2024*. UNOCHA.
[4] Department of Population. (2014). *The 2014 Myanmar population and housing census: Kayin State report*. Ministry of Immigration and Population.
[5] United Nations Children's Fund. (2020). *Nutritional status of children in Myanmar*. UNICEF.
[6] Karen Human Rights Group. (2023). *Undermining livelihoods: Conflict and environmental degradation in Kayin State*. KHRG.
[7] United Nations Development Programme. (2023). *Socio-economic impact assessment of the Myanmar political crisis*. UNDP.
[8] Alwang, J., Siegel, P. B., & Jorgensen, S. L. (2018). *Vulnerability: A view from different disciplines* (Social Protection Discussion Paper Series). World Bank.
[9] Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). SAGE Publications.
[10] Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? Experimenting with data saturation and variability. *Field Methods*, 18(1), 59–82. https://doi.org/10.1177/1525822X05279903
[11] Sen, A. (1981). *Poverty and famines: An essay on entitlement and deprivation*. Oxford University Press.
[12] Brinkman, H. J., & Hendrix, C. S. (2011). *Food insecurity and violent conflict: Causes, consequences, and solutions*(Occasional Paper No. 24). World Food Programme.
[13] World Food Programme. (2023). *Myanmar market price update*. World Food Programme.
[14] Maxwell, D., & Slater, R. (2003). Food policy old and new. *Development Policy Review*, 21(5–6), 531–553.
[15] O'Brien, K., Hayward, B., & Berkes, F. (2018). Rethinking social contracts in a changing climate. *Ecology and Society*, 23(2), Article 12.
[16] Devereux, S., & Sabates-Wheeler, R. (2004). *Transformative social protection* (IDS Working Paper No. 232). Institute of Development Studies.
[17] de Waal, A. (2017). *Mass starvation: Analyzing modern famine*. Polity Press.
[18] Nakashima, D. J., Galloway McLean, K., Thulstrup, H. D., Ramos Castillo, A., & Rubis, J. T. (2012). *Weathering uncertainty: Traditional knowledge for climate change assessment and adaptation*. UNESCO and UNU.

[19] Weatherhead, E., Gearheard, S., & Barry, R. G. (2010). Changes in weather persistence: Insight from Inuit knowledge and key weather station records. *Global Environmental Change*, 20(3), 523–528. https://doi.org/10.1016/j.gloenvcha.2010.04.007
[20] Intergovernmental Panel on Climate Change. (2022). *Climate change 2022: Impacts, adaptation and vulnerability*. Cambridge University Press.
[21] United Nations Development Programme. (2007). *Fighting climate change: Human solidarity in a divided world* (Human Development Report 2007/2008). UNDP.
[22] Eastham, J., Mpelasoka, F., Mainuddin, M., Ticehurst, C., Dyce, P., Hodgson, G., Ali, R., & Kirby, M. (2008). *Mekong River Basin water resources assessment: Impacts of climate change*. CSIRO Water for a Healthy Country National Research Flagship.
[23] Burke, M., Hsiang, S. M., & Miguel, E. (2015). Climate and conflict. *Annual Review of Economics*, 7(1), 577–617. https://doi.org/10.1146/annurev-economics-080614-115430
[24] Carleton, T. A., & Hsiang, S. M. (2016). Social and economic impacts of climate. *Science*, 353(6304), aad9837. https://doi.org/10.1126/science.aad9837
[25] Justino, P. (2012). *War and poverty: From macro-level impacts to household-level mechanisms* (IDS Working Paper No. 391). Institute of Development Studies.
[26] Food and Agriculture Organization. (2022). *The state of food security and nutrition in the world 2022*. Food and Agriculture Organization of the United Nations.
[27] Hugo, G. (2011). Migration, economy and environment in Asia. *Population and Environment*, 32(2), 111–114.
[28] Collier, P., Elliott, L., Hegre, H., Hoeffler, A., Reynal-Querol, M., & Sambanis, N. (2003). *Breaking the conflict trap: Civil war and development policy*. World Bank and Oxford University Press.
[29] Messer, E., & Cohen, M. J. (2007). *Conflict, food insecurity, and globalization* (IFPRI Discussion Paper No. 00718). International Food Policy Research Institute.
[30] Gates, S., Hegre, H., Nygård, H. M., & Strand, H. (2012). Development consequences of armed conflict. *World Development*, 40(9), 1713–1722. https://doi.org/10.1016/j.worlddev.2012.04.021
[31] Food and Agriculture Organization. (2006). *Food security* (FAO Policy Brief Issue 2). Food and Agriculture Organization of the United Nations.
[32] United Nations Children's Fund. (2021). *Fed to fail? The crisis of children's diets in early life* (Child Nutrition Report 2021). UNICEF.
[33] Angelsen, A., & Wunder, S. (2003). *Exploring the forest-poverty link: Key concepts, issues and research implications*(CIFOR Occasional Paper No. 40). Center for International Forestry Research.
[34] Vinceti, B., Termote, C., Ickowitz, A., Powell, B., Kehlenbeck, K., & Hunter, D. (2013). The contribution of forests and trees to sustainable diets. *Sustainability*, 5(11), 4797–4824. https://doi.org/10.3390/su5114797
[35] Wunder, S., Angelsen, A., & Belcher, B. (2014). Forests, livelihoods, and conservation: Broadening the empirical base. *World Development*, 64, S1–S11. https://doi.org/10.1016/j.worlddev.2014.03.007
[36] Chambers, R., & Conway, G. (1992). *Sustainable rural livelihoods: Practical concepts for the 21st century* (IDS Discussion Paper No. 296). Institute of Development Studies.
[37] Scoones, I. (1998). *Sustainable rural livelihoods: A framework for analysis* (IDS Working Paper No. 72). Institute of Development Studies.
[38] Ellis, F. (2000). *Rural livelihoods and diversity in developing countries*. Oxford University Press.