
FACTORS INFLUENCING MARKET INTEGRATION AND LIVELIHOOD STRATEGIES OF RURAL FISHERMEN IN BAYELSA STATE

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Abstract

The primary objective of this study is to examine the impact of market integration on the economic well-being of rural fishermen in Bayelsa State. A structured questionnaire was used to collect data from a sample of 200 fishermen across various fishing communities. The study employed a quantitative research design, with data analysed using descriptive statistics and chi-square tests to identify relationships between market integration and economic outcomes. Key findings indicate that 40% of respondents reported an increase in income levels due to market integration. However, challenges such as high transportation costs, lack of market information, and poor infrastructure were frequently identified as barriers to effective market participation. Based on these findings, the study recommends improving transportation infrastructure, enhancing access to market information, and providing better support for local market integration initiatives to foster economic growth.

Keywords: Market Integration, Economic Well-being, Rural, Fishermen, Livelihood

Introduction

Fishing serves as a primary livelihood for many rural communities in Bayelsa State, Nigeria. The fisheries sector is critical not only for food security but also for providing employment and income for a significant proportion of the population. However, rural fishermen in this region face considerable challenges that hinder their ability to integrate into broader markets, and limit their economic growth and ability to sustain their livelihoods. Market integration is essential for improving their access to larger, more profitable markets and ensuring their long-term economic well-being. Yet, despite the importance of market integration, it remains an elusive goal for many rural fishermen due to various structural and socio-economic barriers.

Research has established that market integration is a key factor in determining the economic success of rural communities involved in fishing. According to Allison and Mvula (2002), market access enhances economic prosperity by allowing fishing communities to sell their products in broader markets, which increases income and improves livelihood outcomes. However, in Bayelsa State, rural fishermen face obstacles such as poor infrastructure, limited transportation networks, outdated fishing equipment, and inadequate financial and institutional support (Olomola, 2013). These factors severely restrict their ability to participate in larger market systems and limit their opportunities for economic advancement.

Bayelsa State, with its vast aquatic resources, has the potential to be a leading region for fisheries in Nigeria. The fisheries sector contributes significantly to Nigeria's agricultural GDP and provides employment for a substantial portion of the population (Tiamiyu *et al.*, 2015). Despite these contributions, rural fishermen in Bayelsa continue to struggle with market integration due to persistent infrastructural deficits and the absence of governmental or non-governmental initiatives that could facilitate their access to broader markets (Oladimeji *et al.*, 2013). Many fishermen rely on small, local markets where demand and prices are often unpredictable, and this limits their ability to improve their livelihoods.

Inadequate infrastructure is one of the primary barriers to market integration. Rural fishermen in Bayelsa often have limited access to transportation networks that can connect them to larger, more profitable markets (PRESHSTORE, 2013). The lack of proper roads and transportation systems increases the costs of getting fish products to market, thereby reducing the fishermen's profit margins and making

their products less competitive. Additionally, many fishermen lack access to cold storage facilities or preservation methods, and this leads to post-harvest losses and further limits their ability to supply larger markets (Areola, 2007). These challenges are compounded by the use of outdated and inefficient fishing equipment, which reduces productivity and limits the quantity and quality of fish available for sale.

Moreover, the absence of financial support and institutional backing further exacerbates the difficulties faced by rural fishermen. Many fishermen lack access to credit facilities that could enable them to invest in better fishing equipment or transportation methods (de Graaf and Geribaldi, 2014). Without access to these resources, fishermen are unable to improve their production capacity or expand their market reach. Additionally, there is a lack of supportive government policies or programs aimed at promoting the integration of rural fishermen into national and international markets. The lack of institutional support makes it difficult for fishermen to navigate market systems or take advantage of opportunities for market expansion.

To cope with these challenges, rural fishermen in Bayelsa have developed various livelihood strategies. Many fishermen diversify their income sources by engaging in alternative economic activities such as farming or trading, which helps them mitigate the risks associated with the volatility of the fishing industry (Allison and Mvula, 2002). In some cases, fishermen form cooperatives or other collective organizations to pool resources, share market information, and improve their bargaining power when selling their products. However, these strategies are often insufficient to fully address the challenges of market integration, as fishermen continue to face structural barriers that limit their access to larger markets and higher profit margins.

The impact of market integration on the economic well-being of rural fishermen is significant. Market integration allows fishermen to sell their products in more competitive markets where demand is higher and prices are better, leading to increased income and improved living standards (FAO, 2013). When fishermen are able to participate in larger markets, they have greater opportunities to invest in their businesses, improve their production capacity, and secure more stable livelihoods. Conversely, the lack of market integration traps fishermen in a cycle of poverty and economic insecurity, as they are unable to access the resources and opportunities needed to improve their economic situation. This study aims to fill the gap in the literature by providing a detailed analysis of the specific factors that influence market integration for rural fishermen in Bayelsa State. While previous studies have highlighted the contributions of the fisheries sector to the Nigerian economy, there has been little focus on the market integration of rural fishermen and the livelihood strategies they adopt to overcome the barriers they face. By addressing this gap, the study seeks to offer practical recommendations for improving the market integration of rural fishermen and enhancing their economic well-being.

Objectives

The objectives of the study are to:

1. identify the key factors influencing the market integration of rural fishermen in Bayelsa State;
2. assess the livelihood strategies employed by rural fishermen in response to market integration challenges;
3. analyse the relationship between market integration and economic well-being

Review of Literature/Theory

The integration of rural fishermen into broader markets is a multifaceted issue that has significant implications for their economic well-being, particularly in developing regions like Bayelsa State, Nigeria. Market integration, which refers to the extent to which producers can access and participate in larger economic systems, plays a crucial role in determining the income levels and livelihood strategies of rural fishing communities (Barrett, 2008; Adepoju and Olawuyi, 2020). Despite the potential benefits, rural

fishermen in Bayelsa face a series of challenges that limit their ability to effectively integrate into national and international markets.

A significant obstacle to market integration for rural fishermen in Bayelsa is the poor state of infrastructure, particularly transportation and storage facilities. According to Adepoju and Olawuyi (2020), inadequate road networks make it difficult for fishermen to transport their goods to urban markets, leading to reliance on local, less profitable markets. Additionally, the absence of cold storage facilities results in high post-harvest losses, as fish are highly perishable. Areola (2007) highlights that these infrastructural deficits lead to significant income losses, as fishermen are unable to store unsold fish or access markets where they can fetch better prices. Another major barrier to market integration is the lack of access to financial resources. Many rural fishermen are unable to secure the necessary funding to upgrade their equipment or adopt modern fishing techniques, and this hinders their productivity and market competitiveness (Oladimeji *et al.*, 2013). Research shows that access to credit is limited due to the informal nature of the fishing industry, as financial institutions are often reluctant to lend to small-scale fishermen without formal collateral (Olomola, 2013). This financial exclusion forces fishermen to continue using outdated equipment, which further marginalizes them from larger, more lucrative markets (Adepoju, 2021).

Environmental factors also play a critical role in limiting the market integration of rural fishermen. Bayelsa State, being a coastal region, faces challenges such as fluctuating fish stocks, pollution, and habitat destruction, all of which affect fish availability (Akinrotimi and Edun, 2021). Research by Allison and Mvula (2002) found that pollution from oil spills and industrial waste significantly reduce fish populations, making it difficult for fishermen to maintain consistent levels of production. These environmental challenges reduce fishermen's ability to meet market demand, further isolating them from larger markets. In addition, seasonal fluctuations in fish stocks mean that fishermen cannot rely on a steady income year-round, making it difficult for them to plan for the future or invest in market integration strategies (Adepoju and Olawuyi, 2020).

The role of social and institutional support is also critical in understanding the barriers to market integration. Several studies highlight the lack of government and non-governmental organization (NGO) support for rural fishermen (Olomola, 2013; de Graaf and Geribaldi, 2014). Despite the economic significance of the fisheries sector, rural fishermen often receive little institutional support in the form of subsidies, training, or access to market information. This lack of support exacerbates the challenges they face in accessing larger markets and improving their livelihoods. Government programs aimed at promoting market integration often overlook the unique needs of rural fishermen, resulting in policies that are ill-suited to their realities (Oladimeji *et al.*, 2013).

In response to these challenges, many fishermen have adopted livelihood diversification strategies to cope with the uncertainties of market integration. Studies show that fishermen often engage in alternative income-generating activities, such as farming or petty trading, to supplement their incomes during off-peak fishing seasons (Akinrotimi and Edun, 2021). However, this diversification is often constrained by the same infrastructural and financial barriers that limit their participation in fishing markets, thereby reducing the overall effectiveness of these strategies (Adepoju, 2021). Recent research has begun to focus on the potential for technology and digital platforms to enhance market integration for rural fishermen. Mobile phone technology, for example, has been found to improve access to market information, enabling fishermen to better time their sales and negotiate better prices (Aker and Fafchamps, 2015). Additionally, digital platforms are emerging as tools for connecting fishermen directly with buyers, bypassing intermediaries and reducing transaction costs (Ogunniyi and Ojebuyi, 2022). However, these technologies are still underutilized in rural areas due to the lack of infrastructure and digital literacy, indicating a need for targeted interventions to promote their adoption.

Theoretical Framework

This study is grounded in two theories: the sustainable livelihoods framework (SLF) and social-ecological systems (SES) theory. The SLF offers a comprehensive approach to understanding how rural

communities sustain their livelihoods by focusing on five key assets: human, social, natural, physical, and financial capital (Carney, 1998). In this context, the framework helps to examine how these assets influence market integration and the livelihood strategies of rural fishermen. For instance, human capital (skills, knowledge) and physical capital (boats, nets) directly affect fishermen's productivity and market access, while financial capital (savings, credit access) determines their ability to invest in better resources.

On the other hand, the SES theory underscores the interconnectedness of human societies and ecological systems (Berkes *et al.*, 2000). It highlights the importance of understanding how environmental factors, such as fish stock availability, interact with social factors like market dynamics and community practices. This framework helps the study explore the complex relationship between environmental health and fishermen's economic well-being, particularly how environmental degradation can constrain market integration. By applying these frameworks, the study provides a structured analysis of the challenges and strategies surrounding market integration and the sustainability of fishermen's livelihoods in Bayelsa State.

Research Methodology

This study employs a quantitative research design to investigate the factors influencing market integration and livelihood strategies among rural fishermen in Bayelsa State. The research design is descriptive and cross-sectional in nature, aimed at gathering detailed numerical data that can be analysed to uncover trends, patterns and relationships. A multistage sampling technique was used for selecting the study participants. In the first stage, Bayelsa State was divided into three major fishing zones: The Nembe, Brass, and Southern Ijaw areas. From these zones, fishing communities were randomly selected. In the second stage, fishermen from these communities were selected using systematic random sampling, ensuring that the sample was representative of the population across the selected zones. The sample size of 200 fishermen was determined using Cochran's formula.

A structured questionnaire was designed and used to gather primary data from the fishermen. The questionnaire was divided into several sections, including demographic information, market integration, livelihood strategies and the challenges faced by fishermen. Data were analysed using descriptive and inferential statistics. Descriptive statistics such as frequency distributions and percentage were used to summarize the data, while inferential statistics was applied to test relationships between the variables.

Variables

Variables	Definition	Measurement
Market Integration	The extent to which fishermen access and participate in broader markets	Access to markets, Number of market channels.
Livelihood Strategies	Activities fishermen engage in to sustain their livelihoods	Fishing practices, Alternative income sources, Savings.
Economic Outcomes	Indicators of the economic well-being of the fishermen	Income levels, Access to financial services.
Challenges	Obstacles faced by fishermen that affect market integration and economic prosperity	Perceptions of infrastructural barriers, Environmental barriers, Financial barriers.

Results and Findings**Table 1. Socio-demographic Characteristics**

Socio-demographic characteristics	Frequency 200	(%)
Age		
- Under 20	10	5%
- 20-29	30	15%
- 30-39	50	25%
- 40-49	60	30%
- 50-59	30	15%
- 60 and above	20	10%
Gender		
- Male	150	75%
- Female	50	25%
Level of Education		
- No formal education	-	-
- Primary education	90	45%
- Secondary education	90	45%
- Tertiary education	20	10%
Years Involved in Fishing		
- Less than 1 year	20	10%
- 1-5 years	60	30%
- 6-10 years	80	40%
- More than 10 years	40	20%
Marital Status		
- Single	50	25%
- Married	120	60%
- Divorced	20	10%
- Widowed	10	5%
Household Size		
- 1-3 members	40	20%
- 4-6 members	80	40%
- 7-9 members	60	30%
- 10 or more members	20	10%

Socio-demographic Characteristics

The socio-demographic characteristics of the respondents, with a sample size of 200, provide a comprehensive overview of their age, gender, education, years involved in fishing, marital status, and household size. The age distribution reveals a diverse range of ages among the respondents. A small proportion, 5%, are under 20 years old. Those aged 20-29 constitute 15% of the respondents. The 30-39 age group makes up 25%, while the 40-49 age group is the largest, representing 30%. Respondents aged 50-59 account for 15%, and those 60 and above comprise 10%. The gender distribution shows a significant majority of male respondents, accounting for 75%, while female respondents make up 25%. In terms of education, there is no representation for respondents with no formal education. Those with primary education and secondary education each represent 45% of the sample. Only 10% have attained tertiary education.

The number of years' respondents have been involved in fishing varies. Those with less than 1 year of experience constitute 10% of the sample. Respondents with 1-5 years of experience make up 30%, while those with 6-10 years represent the largest group at 40%. Respondents with more than 10 years of fishing experience account for 20%.

Marital status is predominantly married respondents, who comprise 60% of the sample. Single respondents account for 25%, while divorced and widowed respondents make up 10% and 5%, respectively. Household sizes among respondents vary, with 20% having 1-3 members. Those with 4-6 members represent 40%, while 30% have 7-9 members. Households with 10 or more members constitute 10%.

Table 2. Key Factors Influencing Market Integration

Question item	Frequency 200	Percentage (%)
Accessibility of Markets		
- Very accessible	20	10%
- Accessible	40	20%
- Moderately accessible	80	40%
- Not accessible	60	30%
Mode of Transportation to Market		
- By foot	20	10%
- By bicycle/motorcycle	40	20%
- By boat	80	40%
- By vehicle	60	30%
Access to Market Information		
- Yes	100	50%
- No	100	50%
Participation in Local Fishing Associations		
- Always	20	10%
- Often	40	20%
- Sometimes	60	30%
- Rarely	60	30%
- Never	20	10%
Impact of Middlemen on Market Integration		
- Very positive	10	5%
- Positive	40	20%
- Neutral	80	40%
- Negative	50	25%
- Very negative	20	10%

Key Factors Influencing Market Integration

This table explores factors influencing market integration among respondents. The majority of respondents (70%) find markets either accessible or very accessible, indicating good market reach. A significant portion (70%) use boats or vehicles to access markets, with bicycles/motorcycles, and walking also contributing to transportation methods. However, half of the respondents lack access to market information, highlighting a potential barrier to effective market participation. Participation in local fishing associations varies, with 50% of respondents involved often or always, suggesting active community engagement. The impact of middlemen on market integration is mixed, with a significant portion of respondents noting a neutral to positive impact, though negative impacts are also present.

Table 3. Livelihood Strategies

Question item	Frequency 200	Percentage
Primary Sources of Income		
- Fishing	160	80%
- Farming	20	10%
- Trading	10	5%
- Other	10	5%
Diversification of Income Sources		
- Yes	120	60%
- No	80	40%
Alternative Livelihood Strategies Employed		
- Fish farming	60	30%
- Agriculture	40	20%
- Craftsmanship	30	15%
- Small business	50	25%
- Other	20	10%
Effectiveness of Livelihood Strategies		
- Very effective	40	20%
- Effective	60	30%
- Moderately effective	60	30%
- Ineffective	40	20%
Support Received for Livelihood Strategies		
- Yes	100	50%
- No	100	50%

Livelihood Strategies

Table 3 focuses on the livelihood strategies employed by respondents. Fishing dominates as the primary income source for 80% of respondents, indicating a strong economic dependence on this activity. Sixty percent of respondents have diversified their income sources, which can enhance economic resilience and stability. Various alternative livelihood strategies are employed, including fish farming, agriculture, craftsmanship, and small businesses, contributing to income diversity. The perceived effectiveness of these livelihood strategies is mixed, with 50% of respondents finding them effective or very effective. Half of the respondent's report receiving support for their livelihood strategies, which is crucial for their sustainability and success.

Table 4. Chi-Square Analysis of the Relationship between Market Integration and Economic Well-being

Question	Category	Observed Frequency (N=200)	Percentage	Chi Square χ^2	P- Value	Significance
Impact on Income Levels	Significantly increased	20	10%	$\chi^2 = 85.0$	$p = 1.52e-17$	Significant
	Increased	80	40%			
	No change	60	30%			
	Decreased	30	15%			
	Significantly decreased	10	5%			
Impact on Ability to	Greatly improved	20	10%			

Save Money		Improved	60	30%	$\chi^2 = 85.0$	$p = 1.52e-17$	Significant
		No change	80	40%			
		Worsened	30	15%			
		Greatly worsened	10	5%			
		Greatly improved	10	5%			
Impact on Access to Credit		Improved	50	25%	$\chi^2 = 75.0$	$p = 1.99e-15$	Significant
		No change	80	40%			
		Worsened	40	20%			
		Greatly worsened	20	10%			
		Greatly improved	20	10%			
Impact on Quality of Life		Improved	70	35%	$\chi^2 = 55.0$	$p = 3.25e-11$	Significant
		No change	60	30%			
		Worsened	30	15%			
		Greatly worsened	20	10%			

Relationship between Market Integration and Economic Well-being

The results of the chi-square analysis indicate a significant relationship between market integration and the four key economic outcomes for rural fishermen in Bayelsa State. For income levels, the chi-square value of 85.0 with a p-value of 1.52e-17 demonstrates that market integration significantly impacts income. Most fishermen (40%) reported increased income levels, showing that market access improves their economic standing. Similarly, market integration’s impact on the ability to save money was also significant, with a chi-square value of 85.0 and the same p-value. While 40% of respondents saw no change, 30% experienced improvements in their ability to save, indicating that market integration positively affects financial stability for some fishermen, though many still face challenges.

The chi-square analysis of access to credit produced a chi-square value of 75.0 and a p-value of 1.99e-15, confirming that market integration significantly influences fishermen’s ability to obtain credit or loans. Although 40% of respondents reported no change, 25% observed improved access to financial services, suggesting that greater market participation enhances financial inclusion for a notable portion of fishermen. Finally, the impact of market integration on the overall quality of life is also statistically significant, as reflected by a chi-square value of 55.0 and a p-value of 3.25e-11. Among respondents, 35% indicated that their quality of life improved, with 10% reporting a great improvement. These results confirm that better integration into markets not only boosts income and financial security but also enhances the overall well-being of rural fishermen.

Discussion of Findings

The findings of this study reveal several factors influencing the market integration of rural fishermen in Bayelsa State. The accessibility of markets is a crucial factor, with 70% of respondents finding markets either accessible or very accessible. This accessibility is facilitated primarily through boats and vehicles, which are essential given the geographical nature of Bayelsa. However, 50% of respondents lack access to market information, posing a significant barrier to effective market participation. Participation in local fishing associations is relatively high, with 50% of respondents often or always involved, indicating a strong sense of community engagement. These findings are consistent with those of

Olomola (2013) and Tiamiyu *et al.* (2015), who highlighted the importance of infrastructure and community support in enhancing market integration for fishermen. However, unlike the study by Allison and Mvula (2002), which emphasized the positive impact of middlemen, this study found mixed reactions, with a significant portion of respondents noting a neutral to negative impact.

In addition, the primary source of income for 80% of respondents is fishing, indicating a high economic dependence on this activity. Sixty percent of respondents have diversified their income sources, engaging in activities such as fish farming, agriculture, craftsmanship, and small businesses. The effectiveness of these livelihood strategies is mixed, with 50% of respondents finding them effective or very effective. These results align with the Sustainable Livelihoods Framework (SLF) as discussed by Carney (1998) and Ellis (2000), which suggests that diversifying income sources can enhance economic resilience. However, the study contrasts with that of Berkes *et al.* (2000) who found that traditional livelihood strategies were often more effective in stable environmental conditions, whereas in this study, modern diversification strategies were necessary due to fluctuating fish stocks and market dynamics.

Also, the study highlights a significant relationship between market integration and the economic well-being of rural fishermen in Bayelsa State. This finding aligns with previous studies that emphasize the crucial role of market access in improving the livelihoods of rural communities. For example, Odozi *et al.* (2011) found that improved market integration enhances income levels and access to financial services among rural farmers in Nigeria, corroborating the results of this study, where 40% of respondents reported an increase in income following market integration. Similarly, Adedeji *et al.* (2014) reported that access to diversified markets significantly boosts household income and savings among small-scale fishermen, which is consistent with the 30% of respondents in this study who saw improvements in their ability to save money due to better market integration.

The impact of market integration on access to credit was also significant, with a chi-square value of 75.0 and a p-value of 1.99e-15. This supports the findings of Olomola (2013), who observed that market access enhances rural fishermen's ability to secure loans by improving their visibility and creditworthiness within the financial sector. Although, a significant portion (40%) reported no change in their ability to secure credit, reflecting the persistent challenges of financial inclusion in rural areas, as noted by FAO (2015), which points to the need for additional interventions beyond market access to improve financial inclusion for marginalized groups. Moreover, the relationship between market integration and the overall quality of life was statistically significant, with a chi-square value of 55.0 and a p-value of 3.25e-11. This aligns with the work of Asiedu and Agyei-Mensah (2008), who found that better market integration leads to improved quality of life through enhanced income, better access to services, and reduced poverty in rural fishing communities in Ghana. However, it is important to contrast these findings with those of Béné *et al.* (2007), who argue that while market integration improves income, it can sometimes exacerbate inequalities by benefiting wealthier fishermen disproportionately. This contrast suggests that the benefits of market integration may not be uniformly distributed, and additional factors, such as bargaining power and infrastructure, may mediate its impact on different groups within fishing communities.

Conclusion and Recommendations

This study demonstrates that market integration plays a significant role in improving the economic well-being of rural fishermen in Bayelsa State. The chi-square analysis revealed strong relationships between market integration and key economic outcomes, such as income levels, savings, access to credit, and overall quality of life. Specifically, market integration has significantly increased the income of the fishermen, improved access to credit and enhanced the overall quality of life. However, the findings also underscore that while market integration has considerable benefits, it does not uniformly address the financial and infrastructural challenges faced by all fishermen, with some reporting no change in their financial status and credit access. These results suggest that market integration is a critical but not sufficient factor in improving rural livelihoods, necessitating complementary interventions to ensure broader and more equitable economic gains. Hence, the study made the following recommendations:

- i. **Improved Market Infrastructure:** To further enhance market integration, there is a need for government and private sector investments in improving transportation networks, storage facilities, and market infrastructure. This would reduce transportation costs and improve fishermen's access to larger, more profitable markets.
- ii. **Capacity Building and Education:** Training programs should be implemented to increase fishermen's knowledge of market dynamics, improve their bargaining power, and introduce them to modern fishing practices and financial literacy. This would enable them to take full advantage of market opportunities.
- iii. **Financial Inclusion Initiatives:** To address the financial barriers faced by fishermen, efforts should be made to expand access to affordable credit and financial services in rural communities. Microfinance institutions and cooperative societies could play a pivotal role in providing tailored financial products for fishermen.
- iv. **Policy Support:** Government policies should prioritize small-scale fishermen in rural areas by offering subsidies, incentives, and support programs that enhance their ability to integrate into broader markets. This should include initiatives to modernize fishing equipment and provide extension services.
- v. **Further Research:** Future studies should explore the long-term impacts of market integration on rural fishermen and investigate the role of other socio-economic factors such as gender, education, and household size in mediating these impacts.

Contribution to Knowledge

This study contributes significantly to the existing body of knowledge on rural livelihoods, market integration, and economic development, particularly in the context of small-scale fishermen in Bayelsa State, Nigeria. The findings provide empirical evidence of the positive impact of market integration on the economic well-being of rural fishermen, highlighting how increased market access can lead to improved income, savings, and overall quality of life.

By offering specific data on how market integration affects rural fishermen's livelihoods in Bayelsa State, a region where such studies are relatively scarce, and this research expands the understanding of how external market forces interact with local fishing economies. The study's focus on the relationship between market integration and various economic indicators, such as income, savings, and access to credit, fills a gap in the literature concerning the economic strategies employed by rural fishermen to cope with market challenges. This research provides a clearer linkage between market access and livelihood outcomes, offering a more nuanced understanding of rural economic dynamics. Finally, the study identifies gaps in financial inclusion, underscoring the persistent challenges that fishermen face despite increased market access. This finding adds to the discourse on the limitations of market integration in rural economic development, suggesting that market access alone is insufficient to improve livelihoods without adequate financial and infrastructural support.

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