

# Analysis Of Local Parboiled Rice Marketing in Alkaleri Local Government Area, Bauchi State, Nigeria

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**Abstract-** *This study analyzed the marketing of local parboiled rice in Alkaleri Local Government Area of Bauchi State, Nigeria. The specific objectives were to describe the socioeconomic characteristics of the local parboiled rice marketers, analyse the profitability of local Parboiled rice marketing; determine the effects of socio-economic characteristics on the Gross Margin of the respondents. Primary data were collected from a sample of 115 marketers using structured questionnaires, selected through a multistage sampling technique. Descriptive statistics, gross margin analysis, and multiple regression models were employed for data analysis. The results revealed that the majority (89.47%) of the parboiled rice marketers were within the economically active age group, with a significant proportion 97.37% having formal education and considerable marketing experience. The marketing system involved key actors such as producers, processors (par boilers), wholesalers, retailers, and consumers, with relatively simple distribution channels. The gross margin analysis and net profit was computed to be N380, 400 and N366, 215, indicated that local parboiled rice marketing is profitable, with marketers earning positive returns on investment. Multiple regression analysis revealed that the coefficient of five variables used in the model were significant at varying levels of probability. The study concluded that local parboiled rice marketing in the study area is a viable enterprise. It is recommended that government and relevant stakeholders improve market infrastructure, enhance access to affordable credit, promote better support for value addition activities, and encourage female participation and strengthen capacity building and training.*

**Keywords:** *Processing, Local, Parboiled, Efficiency, Marketing.*

## I. INTRODUCTION

Rice is one of the most important staple foods in Nigeria and plays a significant role in food security, income generation, and employment creation (Food

and Agriculture Organization, 2020). In recent years, the demand for rice has increased considerably due to population growth, urbanization, and changing dietary preferences. Among the various forms of rice consumed, parboiled rice is widely preferred because of its nutritional value, longer shelf life, and better cooking qualities. As a result, the marketing of locally processed parboiled rice has become an important component of the agricultural value chain in Nigeria (National Bureau of Statistics, 2021).

Despite increased domestic production, the marketing system for local parboiled rice continues to face several challenges. Studies have shown that high production costs, poor infrastructure, inadequate processing facilities, and weak market linkages contribute to inefficiencies in the rice value chain (IFPRI, 2019). In addition, fluctuations in price due to seasonal supply variations and economic instability often affect the profitability and sustainability of rice marketing activities. These issues limit the competitiveness of locally produced rice compared to imported varieties, which are often perceived to be of better quality and more affordable (Phillip et al., 2018).

In Bauchi State, rice production and marketing constitute a vital agricultural enterprise, particularly in rural areas such as Alkaleri Local Government Area. The area is known for its active participation in rice farming, processing, and distribution, making it an important hub for local parboiled rice trade. The marketing system in Alkaleri involves various actors, including farmers, processors, wholesalers, and retailers, all of whom contribute to the movement of rice from production areas to consumers (Mohammed et al., 2020).

However, the efficiency of local parboiled rice marketing in the area is influenced by several factors, including transportation costs, storage facilities, access to credit, and market information. Inadequate infrastructure and limited access to modern processing technologies often result in poor quality rice, which affects market prices and consumer acceptance. Furthermore, the presence of imported rice in Nigerian markets creates stiff competition for locally produced rice, thereby affecting demand and profitability (Kumar et al., 2023).

Given the importance of rice in Nigeria's food system and the challenges facing its marketing, there is a need for empirical analysis of local parboiled rice marketing systems at the grassroots level (Patindol et al., 2019). Therefore, this study focuses on the analysis of local parboiled rice marketing in Alkaleri Local Government Area of Bauchi State. The study aims to provide insights into the structure, performance, and constraints of the marketing system, with a view to improving efficiency, enhancing profitability, and promoting sustainable agricultural development in the area.

## 1.2 Objectives of the Study

The broad objectives of the study are to analyse local parboiled rice marketing in Alkelere Local Government Area of Bauchi State. The specific objectives area to:

- i. describes the socio-economic characteristic of the local parboiled rice marketers,
- ii. analyse the profitability of local parboiled rice marketing in the study area,
- iii. determine the factors affecting the socioeconomics characteristics of the respondents,

## 2.1 Review of the Literature

The literature on local parboiled rice marketing covers key areas such as the importance of rice in Nigeria, processing and value chain activities, marketing systems, and constraints affecting efficiency.

### Importance of Rice and Parboiled Rice in Nigeria

Rice is a major staple food in Nigeria and contributes significantly to food security, employment, and income generation. The demand for rice has

continued to rise due to population growth, urbanization, and changing consumption patterns.

Studies show that both local production and consumption of rice have increased substantially over the years, making rice a strategic commodity in Nigeria's agricultural sector. However, consumer preference is often influenced by quality and price differentials between local and imported rice, with many consumers still preferring imported varieties due to perceived quality advantages (Odenigbo et al., 2016).

Parboiled rice, in particular, is widely consumed because of its improved nutritional value, reduced grain breakage, and better storage quality. Research indicates that the method of parboiling significantly affects the physical and chemical quality of rice, with improved techniques producing higher-quality grains compared to traditional methods (Niyonshima et al., 2020).

### Rice Processing and Value Chain

Rice processing, especially parboiling, is an essential stage in the rice value chain. It involves soaking, steaming, drying, and milling of paddy rice before it reaches consumers. Studies on rice processing in Nigeria highlight the role of small-scale processors and the adoption of improved technologies in enhancing rice quality and marketability. For instance, research in Niger State found that adoption of improved processing technologies is influenced by factors such as training, cost of technology, and access to extension services (Islam et al., 2024).

In addition, rice processing and marketing activities contribute significantly to rural livelihoods by generating income and employment opportunities. Evidence from studies in Benue State shows that participation in rice processing and marketing improves household welfare and access to basic needs.

Marketing of Local Parboiled Rice (Takeshima et al., 2016)

Agricultural marketing involves all activities that facilitate the movement of goods from producers to consumers. In the context of rice, marketing includes assemblage, transportation, storage, processing, and distribution. Efficient marketing systems ensure fair

prices for producers and affordable prices for consumers (Kohls & Uhl, 2002; Olukosi et al., 2007).

However, the marketing of local parboiled rice in Nigeria faces several challenges. High production and processing costs, poor infrastructure, and weak market linkages have been identified as major factors limiting the competitiveness of local rice. For example, the high cost of paddy rice accounting for a large proportion of total production cost has been cited as a major constraint affecting local rice marketing (IFPRI, 2019).

Furthermore, inadequate storage facilities and poor transportation networks often lead to post-harvest losses and price instability, which negatively affect market performance. The presence of imported rice in Nigerian markets also creates strong competition, reducing the demand for locally produced rice (FAO, 2019).

#### Structure and Performance of Rice Markets

The structure of rice markets in Nigeria is typically characterized by the involvement of multiple actors, including farmers, processors, wholesalers, retailers, and consumers. Market performance is often assessed using indicators such as market margins, price spread, and marketing efficiency (Olukosi, 2007).

Empirical studies have shown that inefficient market structures, lack of standardization, and poor access to market information contribute to inefficiencies in agricultural marketing systems. In many rural areas, including local government areas like Alkaleri, marketing activities are dominated by small-scale traders who operate under limited capital and infrastructure constraints (Afolami et al., 2015).

#### Constraints in Local Parboiled Rice Marketing

Several studies have identified key constraints affecting local rice marketing in Nigeria. These include: High transportation and transaction costs, Poor Road infrastructure, Limited access to credit facilities, inadequate storage and processing facilities, Lack of market information systems (Duana et al., 2018).

#### 3.1 Area of the Study

This study was conducted in Alkaleri Local Government Area, located in Bauchi State, in the North-Eastern region of Nigeria. Alkaleri Local Government Area is one of the largest LGAs in Bauchi State and serves as an important agricultural zone within the state. Geographically, Alkaleri lies approximately between latitudes 9°30'N and 11°00'N and longitudes 10°00'E and 11°00'E. It shares boundaries with Kirfi Local Government Area, Toro Local Government Area, and Tafawa Balewa Local Government Area, as well as parts of Gombe State.

The area is characterized by a tropical climate with distinct wet and dry seasons, supporting a wide range of agricultural activities. The major occupation of the people in Alkaleri LGA is agriculture, with a large proportion of the population engaged in crop production, livestock rearing, and agro-processing. Key crops grown in the area include Rice, Maize, Sorghum, Millet, and Groundnut. Among these, rice production has gained prominence due to increasing demand and favorable agro-ecological conditions.

Parboiling of rice is a common processing activity in the area, carried out mainly by small-scale processors using traditional methods. The presence of local rice processing activities has contributed to the growth of rice marketing within the area. Alkaleri LGA hosts several local markets where agricultural commodities, including parboiled rice, are traded. These markets serve as important centers for the exchange of goods between farmers, processors, wholesalers, and retailers.

The marketing system involves various intermediaries who facilitate the movement of rice from production areas to final consumers within and outside the local government area. The choice of Alkaleri Local Government Area for this study is based on its active involvement in rice production, processing, and marketing.

#### 3.2 Data collection

Primary data was used for the study; the primary data was obtained through structured questionnaires.

### 3.3 Sampling Technique and Sample Size

Multi-stage sampling technique was used for the study. In the first stage, purposive sampling was employed to select Alkaleri, Yola-doka and Lariski markets based on the pronouncement of rice marketing in the study area.

In the second stage, sampling frame from Alkaleri, Yola-doka and Lariski markets were used for the collection, Alkaleri market has 104 marketers, Yola-doka market 55 marketers while Lariski market has 65 sample frames. Hence, in the third stage, 50% from the list of each market were proportionately selected to have a total respondent of 115 which served as sample size for the study.

### 3.4 Analytical Tools

The analytical tools employed were include descriptive statistics, Gross margin analysis, multiple regressions model,

#### 3.4.1 Descriptive Statistics

Descriptive statistics was used for data analysis. The descriptive statistics include the mean, frequency distribution and percentages. These were used to achieve objectives (i)

#### 3.4.2 Gross Margin

The gross margin analysis was used to determine the profitability of local Parboiled rice marketing to achieved specific objective (ii)

The gross margin is expressed:

$$GM = TR - TVC$$

Where, GM = Gross Margin (N/kg)

TR = Total Revenue (N/kg)

TVC = Total Variable Cost (N/Kg)

The gross margin was used because fixed cost is not incurred (Iheanacho 2000)

#### 3.4.3 Multiple Regressions

Multiple regression models are used for estimating the relationship between dependent and independent variables. The model was used to determine the effect of some socio-economic factors on Gross Margin.

This were used to achieve (objective iii)

The general model is specified thus:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8+e)$$

Where Y = Dependent variable

X1 = Initial capital

X2 = Age of marketers

X3 = Sex

X4 = Marital status

X5 = Membership of a group

X6 = Family size

X7 = Quantity being handled per week

X8 = Marketing cost

e = error term

The Socioeconomics characteristics and their Tables are discussed below.

Table 4.1: Socio economic characteristics of the respondents

Gender	Frequency	Percentage
Male	106	92.17
Female	9	07.83
Age (years)		
20-30	31	26.96
31-40	47	40.87
41-50	26	22.61
51-60	11	09.57
Mean	35.47	
Experience		
1-10	37	32.17
11-20	42	36.52
21-30	21	18.26
31-40	15	13.04
Mean	15.80	
Educational Level		
Primary Education	17	14.78
Secondary Education	9	07.83
Tertiary Education	5	04.35
No formal Education	26	22.61
Arabic	58	50.43
Marital Status		
Married	76	66.09
Single	18	15.65
Widowed	08	06.96
Divorced	13	11.30
Household Size		

1-10	46	40.00
11-20	41	35.65
21-30	28	24.35
Mean	7.89	
Source of Income		
Personal saving	54	46.95
Bank	7	06.08
Friend and family	32	27.82
Cooperative	22	19.13
Major Occupation		
Livestock Rearing	14	12.17
Farming	11	09.56
Traders	83	72.17
Civil Servant	07	06.08
Market category		
Wholesales	28	24.35
Retailers	87	75.65
Monthly Income		
100,000 – 500,000	25	21.73
500,001 – 1,000,000	27	23.47
1,000,001 – 1,500,000	13	11.30
1,500,001 – 2,000,000	23	20.00
2,000,001 – 2,500,000	9	07.82
2,500,001 – 3,000,000	6	05.21
3,000,001 – 3,500,000	0	00.00
3,500,001 – 4,000,000	2	01.73
4,000,001 – 4,500,000	7	06.08
4,500,001 – 5,000,000	3	02.60
5,000,001 and above	0	00.00
Total	115	100.00

Source: Field Survey Data, 2025

#### Socio-Economic Characteristics of Respondents

The socio-economic characteristics of the respondents, as presented in Table 4.1, provide insight into the demographic and economic attributes that may influence participation in parboiled rice marketing in the study area.

The gender distribution shows that the majority of the respondents were male, accounting for 92.17%, while only 7.83% were female. This implies that parboiled rice marketing in the study area is predominantly a male-dominated enterprise. The low participation of females may be attributed to cultural, social, or economic constraints that limit their involvement in large-scale marketing activities.

The age distribution indicates that most respondents were within the economically active age group. The mean age of 35.47 years suggests that the respondents are relatively young and energetic, which is advantageous for engaging in the physically and mentally demanding activities associated with marketing.

In terms of marketing experience, the findings reveal, the mean marketing experience of 15.80 years indicates that respondents possess considerable experience, which may enhance their efficiency and decision-making in the business.

Educational attainment shows a mixed pattern among respondents. A large proportion (50.43%) had Arabic education, while 22.61% had no formal education. Respondents with primary, secondary, and tertiary education accounted for 14.78%, 7.83%, and 4.35%, respectively. This suggests that although formal education levels are relatively low, many respondents possess informal or religious education, which may still contribute to basic literacy and numeracy skills required for business operations.

The marital status distribution reveals that 66.09% of respondents were married, indicating that most have family responsibilities that may influence their level of commitment to income-generating activities. Singles, divorced, and widowed respondents accounted for 15.65%, 11.30%, and 6.96%, respectively.

Household size distribution shows that 40.00% of respondents had between 1–10 members, 35.65% had 11–20 members, and 24.35% had 21–30 members, with a mean household size of 7.89 persons. This relatively large household size suggests high dependency ratios, which may increase the pressure on respondents to generate income.

Regarding the source of income, 46.95% of respondents financed their business through personal savings, while 27.82% relied on friends and family. Cooperative societies accounted for 19.13%, and only 6.08% obtained funds from banks. This indicates limited access to formal credit institutions, which may constrain business expansion.

The distribution of respondents by major occupation shows that trading was the dominant activity, accounting for 72.17%, followed by livestock rearing (12.17%), farming (9.56%), and civil service (6.08%). This implies that most respondents are primarily engaged in commercial activities, particularly trading.

Market participation indicates that 75.65% of respondents were retailers, while 24.35% were wholesalers. This suggests that retail marketing is more prevalent in the study area, possibly due to lower capital requirements compared to wholesale trading.

The income distribution shows variability in respondents' earnings. The largest proportion (23.47%) earned between ₦500,001 and ₦1,000,000 monthly, followed by 21.73% earning between ₦100,000 and ₦500,000. A smaller proportion earned above ₦2,000,000, while very few earned above ₦3,500,000. This indicates that while the enterprise is profitable, most respondents operate at small to medium scales.

Overall, the findings reveal that parboiled rice marketing in the study area is dominated by relatively young, experienced, and male traders with moderate income levels and limited access to formal credit. These socio-economic characteristics play a significant role in shaping the structure, performance, and profitability of the enterprise.

#### Interpretation of Costs and Returns of Parboiled Rice Marketing

The result presented in Table 4.2 shows the average monthly costs and returns of parboiled rice marketing in the study area. The analysis reveals that the total revenue realized from the sale of parboiled rice was ₦954,500 per month. This indicates a relatively high level of income generation from the enterprise.

The total variable cost incurred by the marketers amounted to ₦574,100. Among the variable cost components, the cost of purchasing parboiled rice constituted the largest proportion (₦488,500), indicating that the enterprise is highly capital-intensive in terms of commodity acquisition. Transportation cost (₦64,250) also accounted for a

significant share of the total variable cost, reflecting the importance of logistics in the marketing process.

Other variable costs such as loading and off-loading (₦2,100 combined), storage (₦12,600), and miscellaneous expenses (₦6,650) were relatively minimal.

The total fixed cost was estimated at ₦14,185 per month, comprising rent (₦9,910) and taxes (₦4,275). This suggests that fixed costs are relatively low and do not constitute a major burden on the marketers.

Table 4.2: Average Analysis of Costs and Return of Parboiled Rice per Month

Items	Units	Total
Revenue (₦)		
Sale of Parboiled Rice	Kg	954,500
Total Revenue		954,500
Variable Cost		
Cost of Parboiled Rice	Kg	488,500
Cost of Loading	Mandays	1,050
Cost of Off loading	Mandays	1,050
Transportations		64,250
Cost Storage		12,600
Miscellaneous Cost		6,650
Total Variable Cost		574,100
Fixed Cost		
Rent per month		9,910
Taxes per month		4,275
Total Fixed Cost		14,185
Gross Margin = TR - TVC = A - B		380,400
Total Cost = TFC + TVC = C + B		588,285
Net Profit = GM - TFC OR TR - TC		366,215

Source: computed from field survey, 2025

The gross margin, which represents the difference between total revenue and total variable cost, was

₦380,400. This implies that after covering all variable expenses, the marketers still retain a substantial income to cover fixed costs and profit.

The total cost of the enterprise was ₦588,285, obtained as the sum of total variable and fixed costs. After accounting for all costs, the net profit realized by the marketers was ₦366,215 per month. This positive net return indicates that parboiled rice marketing is a profitable venture in the study area.

Overall, the findings suggest that parboiled rice marketing is economically viable, with high returns relative to costs. The high gross margin and net profit further imply that the enterprise has the potential to improve the livelihoods of marketers and contribute to income generation in the area. However, the dominance of variable costs, particularly the cost of purchasing rice and transportation, suggests that any increase in these costs may significantly affect profitability.

#### Analysis of Effects of Socio-economic Characteristics on the Gross Margin of the

##### Respondents

The result of the multiple regression analysis used to examine the analysis of effects of Socio-economic characteristics on the gross margin of the respondents is presented in Table 4.3. The double logarithm function was chosen as the lead equation based on economic, econometric and statistical criteria. The coefficient of five out of the eight explanatory variable used in the model were significant at varying levels of significance and have the expected signs. These variables include; Initial Capital (X1), Age of Marketer (X2), Membership of a group (X5), Quantity being handled per week (X7), Marketing cost (X8). The value of the coefficient of determination, R<sup>2</sup> of 0.79 indicates that 79% of the variation of gross margin of the respondents is explained by the variables used in the model, an indication that the data have fitted well into the model. The overall model is also significant at 1% level as indicated by the value of the F-statistic

Table 4.3 Result of Multiple Regressions Analysis

Variab les	Param eters	Coeffic ients	Stan dard Error	T- value	Sig n
Consta nt	$\beta_0$	2.388	0.358	6.677 ***	0.0 00
Initial Capital (X <sub>1</sub> )	$\beta_1$	0.373	0.040	9.385 ***	0.0 00
Age of Market er (X <sub>2</sub> )	$\beta_2$	0.320	0.107	2.988 ***	0.0 03
Sex (X <sub>3</sub> )	$\beta_3$	0.015	0.022	0.692	0.4 90
Marital Status (X <sub>4</sub> )	$\beta_4$	-0.046	0.025	-1.844	0.0 67
Membe rship of a group (X <sub>5</sub> )	$\beta_5$	0.044	0.018	2.449 **	0.0 15
Family size (X <sub>6</sub> )	$\beta_6$	-0.014	0.052	-0.272	0.7 86
Quantit y being handled per week (X <sub>7</sub> )	$\beta_7$	1.129	0.111	10.21 5***	0.0 00
Marketi ng cost (X <sub>8</sub> )	$\beta_8$	-0.466	0.094	- 4.939 ***	0.0 00
R- squared					0.793
F- statistic					87.022
					***

Source: Field Survey, 2025

\*\*\* Significant at 1% level \*\* significant at 5% level  
 \* significant at 10 % level

The coefficient of initial capital (X1) is significant at 1% level but positively related to the gross margin. This implies that an increase in initial capital of

parboiled rice marketers will lead to an increase in the gross margin. The age of marketer (X2) was statistically significant at 1% level and had a greater influence on the parboiled rice gross margin of marketer. This means that the gross margin of parboiled rice marketer increases with rise in the marketer age. In other words, older parboiled rice marketer tends to have more gross margin than the younger one. The positive signs in membership of a group (X5) indicate that for any one-unit increase in membership of a group will in the gross margin of the parboiled rice marketer, there will be an increase of 5% in the gross margin in the study area. This is a priori expectation.

The coefficient of quantity being handled per week (X7) is also significant at 1% level but positively related to the gross margin. This implies that an increase in the quantity being handled per week of parboiled rice will lead to an increase in the gross margin. The Marketing cost (X8) is significant at 1% level and inversely related to the gross margin.

This implies that increase in gross margin is accompanied by a corresponding decrease in the price paid by marketers for the commodities. This is in agreement with economic theory. All things being equal, when cost of parboiled rice sold to markers decreases and the selling price of the commodity remain unchanged markers are more likely to make higher profits which will in turn increase the gross margin.

#### CONCLUSION

This study examined the analysis of local parboiled rice marketing in Alkeleri Local Government Area of Bauchi State, Nigeria, with a focus on the socio-economic characteristics of marketers and the costs and returns associated with the enterprise. The findings revealed that parboiled rice marketing is predominantly carried out by males who are within the economically active age group, with considerable marketing experience. Although the level of formal education among respondents is relatively low, many possess Arabic or informal education, which supports their participation in marketing activities.

The majority of the respondents are married with moderate household sizes, and most rely on personal savings and informal sources of finance, indicating limited access to formal credit facilities.

The cost and return analysis showed that parboiled rice marketing is a profitable venture in the study area. The enterprise generates substantial revenue relative to the total cost incurred, with a high gross margin and a significant net profit. Variable costs, particularly the cost of purchasing rice and transportation, constitute the largest proportion of total costs, while fixed costs remain minimal. Despite these costs, marketers are able to realize appreciable profits, confirming the economic viability of the business.

Furthermore, the dominance of retailers over wholesalers suggests that the market structure is largely characterized by small- to medium-scale operators. Income distribution among respondents indicates that while the business is profitable, most marketers operate within moderate income levels, reflecting varying scales of operation.

In conclusion, local parboiled rice marketing in Alkeleri LGA is a viable and income-generating enterprise with strong potential for improving the livelihoods of participants. However, challenges such as limited access to formal credit and high variable costs may constrain expansion. Addressing these constraints could further enhance the profitability and sustainability of the enterprise in the study area

#### RECOMMENDATIONS

Based on the findings of this study on the analysis of local parboiled rice marketing in Alkeleri Local Government Area of Bauchi State, the following recommendations are proposed:

1. Improved Access to Credit Facilities: Government and financial institutions should provide accessible and affordable credit facilities to marketers. This will enable them to expand their scale of operation, increase purchasing capacity, and improve overall profitability.
2. Strengthening of Cooperative Societies: Marketers should be encouraged to form and actively participate in cooperative societies.

Cooperatives can enhance access to loans, facilitate bulk purchasing, reduce transaction costs, and improve bargaining power in the market.

3. Provision of Market Infrastructure: Government and relevant stakeholders should invest in improved market infrastructure such as storage facilities, roads, and transportation systems. This will help reduce post-harvest losses and high transportation costs, thereby increasing marketers' profit margins.
4. Capacity Building and Training: Training programs should be organized to improve marketers' knowledge in areas such as financial management, pricing strategies, record keeping, and modern marketing techniques. This is particularly important given the relatively low level of formal education among respondents.
5. Price Stabilization Policies: Government should implement policies aimed at stabilizing the prices of parboiled rice. This will help protect marketers from extreme price fluctuations and reduce uncertainty in the market.
6. Encouragement of Female Participation: Efforts should be made to promote the participation of women in parboiled rice marketing through targeted support programs, training, and access to finance, in order to ensure gender inclusiveness in the enterprise.
7. Reduction in Transportation Costs: Improvement of rural and feeder roads, as well as the provision of subsidized transportation services, will help reduce the high cost of transportation, which constitutes a significant portion of the total variable cost.
8. Support for Value Addition Activities: Marketers should be encouraged to engage in value addition activities such as improved packaging, branding, and quality enhancement of parboiled rice to increase market value and competitiveness.

Implementing these recommendations will enhance the efficiency, profitability, and sustainability of parboiled rice marketing in Alkaleri LGA, thereby contributing to income generation, employment creation, and food security in the study area.

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