ECONOMIC EVALUATION OF APPEALS-SUPPORTED RICE, COCOA, AND BROILER ENTERPRISES IN CROSS RIVER STATE, NIGERIA

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Abstract
The study carried out an "economic evaluation of rice, cocoa, and broiler production enterprises supported by the World Bank-assisted APPEALS project in Cross River State, Nigeria''. Using a sample of 301 producer cooperatives, data were collected through questionnaires, records, and focus group discussions. Results from the study showed that, 82 percent of the enterprises had less than 3 employees. More than half of the enterprises had existed for over 11 years (50.4 percent). Among the average total cost incurred by these enterprises per hectare, labour cost accounted for 64.70 percent of the average total costs for rice. Similarly, for a batch of 500 broilers enterprises, the cost of feed accounted for 63.9 percent of the average total costs while for cocoa enterprises, rent on farm accounted for 70.46 percent of the average total costs. The profit margin percentage of 25.3 %, 26.9 % and 38.5% was obtained for rice, broiler and cocoa production enterprises respectively, while the rates of return on investment of 0.34, 0.63 and 0.37 for rice, cocoa and broilers were realized. This implies that for every one naira invested across the production of these three commodities, benefits of ₦ 0.34, ₦ 0.63 and ₦ 0.37 were achieved confirming the profitability of APPEALS-supported agribusinesses.
***Key Words**: Agribusinesses, Cost and returns, Donor Project*

Introduction

Agriculture accounts for more than sixty percent of Nigeria's Gross Domestic Product, serving as a major source of employment, ensuring food availability, and sustaining rural communities. However, the agricultural sub-sector in Nigeria is not fully explore, due to low output levels, poor market access, inadequate infrastructure especially in rural areas, and support for Small Holder Farmers. Tackling these challenges, the Nigerian government, in collaboration with donor partners like the World Bank, FAO, IFAD, has supported several agricultural development projects across the country with the view of strengthening agricultural value chains, increasing productivity, and improving incomes by farmers. One of such donor funded project is the Agro-Processing, Productivity Enhancement and Livelihood Improvement Support (APPEALS) Project implemented across five states in Nigeria (Cross River, Enugu, Kaduna, Kano, Kogi and Lagos), which targets priority value chains, were rice, cocoa, and poultry (broiler), with a core objective of increasing productivity and improving processing and marketing capacities. Cross River State, blessed with rich fertile land and agro-ecological conditions supporting vast agricultural crops, is a key beneficiary of APPEALS project.

The APPEALS project was design to mitigate barriers by providing specialized support, input subsidies, infrastructural support, and market linkages to promote the competitiveness of targeted value chains of cocoa, rice and poultry in the state. However, while evidence suggests

some improvements, there is need for rigorous empirical evaluation of the performance of these interventions, particularly in the case of rice, cocoa, and broiler enterprises. Without a detailed performance study of the implementation, it remains uncertain whether the project is met its designed objectives of enhancing productivity of the targeted value chians, increasing incomes, and improving livelihoods through market linkages.

Rice remains a strategic crop in Nigeria's agricultural policy due to its role in food security and import substitution. According to Akinyemi and Adeyemo (2019), rice production in Nigeria has expanded significantly since the implementation of interventions focused on input support and irrigation infrastructure. Their study in southwestern Nigeria found that access to improved seeds and fertilizers led to yield increases of over 30% among project beneficiaries. This finding underscores the importance of targeted input subsidies in enhancing productivity, a core strategy employed by the APPEALS project. Ogunniyi *et al*. (2020) analyzed the impact of agricultural development programs on rice productivity in northern Nigeria, emphasizing that training and capacity building significantly influence farmers' adoption of best practices. Their econometric analysis revealed that extension services and access to credit positively correlated with rice yield per hectare. This supports the APPEALS model, which combines training, extension, and financial support to enhance performance. However, yield increases are only one component of economic viability. Alawode *et al*. (2021) conducted a cost-benefit analysis of rice farming under intervention programs and concluded that while gross margins increased, cost structures (especially labor and transport) remained high, affecting net profitability.

Adedeji *et al*. (2018) noted that although Nigeria remains a major cocoa producer globally, yields per hectare are significantly lower than those in Ghana and Côte d'Ivoire. Their study linked low productivity to poor access to disease-resistant varieties and weak extension systems. To address these issues, intervention projects have promoted value chain integration and the adoption of Good Agricultural Practices (GAP). In Cross River State, Okon and Ogar (2019) assessed the effects of such initiatives on cocoa farmers' income and reported significant increases among those who adopted improved practices, supported by cooperative structures. The APPEALS project's emphasis on value chain development and farmer aggregation builds on this model by supporting inputs, training, and market access. According to Oyebanji *et al*. (2022), project beneficiaries often face delays in accessing support due to bureaucratic bottlenecks, their study of cocoa farmers in Edo and Cross River States indicated that sustained impacts require stronger monitoring frameworks and institutional coordination—lessons critical for ensuring the long-term effectiveness of APPEALS interventions.

The poultry industry, particularly broiler production, is one of the fastest-growing agricultural sectors in Nigeria. It offers a high return on investment and a short production cycle. Recent studies have explored the profitability and risks associated with broiler farming. For instance, Olagunju *et al*. (2019) found that broiler production is economically viable under semi-intensive systems, but feed costs and disease outbreaks significantly affect profitability. In a more focused study, Musa *et al*. (2021) examined the impact of donor-funded interventions on broiler farmers in Kaduna State. Their findings showed that access to subsidized feed and veterinary services improved profit margins by up to 40%. The study also emphasized that technical training played a crucial role in improving feed conversion ratios and reducing mortality. Similarly, Adebayo and Salihu (2020) highlighted the importance of market linkages in sustaining poultry businesses. Their research revealed that farmers with formalized buyer

arrangements (e.g., off-taker agreements) experienced more stable incomes and reduced marketing risks. Gender inclusion is another emerging theme.

Finally, a recent meta-analysis by Adekunle and Olatunji (2024) reviewed over 30 agricultural intervention programs in Nigeria and concluded that while donor-supported projects tend to show early success, their long-term impact is contingent on strong local ownership, capacity building, and institutional reforms. These insights are vital in assessing the full economic implications of the APPEALS project in Cross River State. This study focuses on conducting an economic evaluation of rice, cocoa, and broiler production enterprises supported by the APPEALS project in Cross River State. It seeks to assess the economic viability, productivity outcomes, and livelihood improvements among project beneficiaries, with the aim of providing evidence-based recommendations for sustainable agricultural development. Specifically, the study will describe the business profiles of the enterprises supported by the Project in terms of ownership type, number of employees, revenue outlay and sources of income as well as determine the cost & returns of cocoa, rice and poultry production enterprises supported by APPEALS project.

Materials and Methods

Study Area

The research was carried out in Cross River State, located in Nigeria's south-south geopolitical zone. The state, lying between latitudes 4°35'N and 7°5'N and longitudes 7°30'E and 9°45'E, comprises 18 Local Government Areas and three Agricultural Development Programme (ADP) zones aligned with its senatorial districts: South, Central, and North. Each zone has distinct ecological and agricultural features. The Southern zone includes mangrove swamps, rainforests, and coastal marine environments, with fishing, farming, lumbering, and mining as primary occupations. Major crops are oil palm, rubber, cassava, maize, and vegetables. Key ethnic groups include the Efik and Ejagham.

The Central zone, characterized by rainforest vegetation, is known for cultivating cocoa, oil palm, cassava, yams, rice, and rubber. It is composed of areas like Yakurr, Abi, and Ikom, with Ejagham as the predominant language. In the Northern zone, which has derived savannah vegetation, farming dominates, with maize, yam, groundnut, beans, bambara nuts, pepper, and cassava widely cultivated. Rice is also grown in swampy and upland areas. This zone includes areas like Ogoja and Obudu, with Bekwarra as the main language.

Agribusiness activities in the state span production, processing, and marketing. Under the APPEALS project, which operated across all three zones, a total of 6,921 beneficiaries were supported and organized into 710 cooperatives and SMEs. The intervention was demand-driven and tailored to the specific needs of each agricultural zone, enhancing agricultural productivity and enterprise development throughout the state.

Sampling Procedure

A list of 710 agribusiness cooperatives supported by APPEALS project was obtained in the various value chain segments from the project office broken into production, processing and marketing, 547 groups into production were picked as population for the study since the study focuses on producers groups, appropriate sample size was calculated using Taro Yemane formula at 10% confidence level. A total of 301 producers Cooperatives were drawn from the

sample frame using simple random sampling techniques. The President or Managers of the cooperatives were purposively selected for the interview.

Data Collection

Primary data proposed for this study were collected using questionnaire, records kept by the farmers and Focused Group Discussions (FGD) with the managers or highest decision maker of the sampled enterprises in the field. Data were collected on the business performance of the enterprises such as; ownership type, employees, capital outlay, sources of income, business cost, output in terms of revenue, profit etc. Business sustainability measures were collected using Likert scale questions. Also, data associated with the manager or highest decision maker was sourced to determine the effects of managers' attributes on the survival of the enterprises.

Data Analysis

Descriptive statistics such as frequency distribution tables, percentages, means and standard deviation was used to describe the business profile of the agribusiness enterprises. Profitability is the ability of the agribusinesses to generate earnings and is vital for their sustainability. Profitability analysis was calculated to determine the profitability index, return on investment, rate of return on variable costs and operating ratio. These ratios provide information about the way the enterprises are operating and measure the profit or net earning success of the agribusinesses.

The costs - returns analysis comprised of the following components and their measurements:

GM = TR – TVC ……. (1)

TC = TVC + TFC ……. (2)

NI = GM – TFC ……. (3)

Where GM = Gross Margin, TR = Total Revenue, TVC = Total Variable Cost, TC = Total Cost, TFC = Total Fixed Cost, NI = Net Income

Profitability Ratios

In this study, four representative ratios were examined to gain insight into the profitability level of the businesses. They include operating ratio, profitability index, return on investment and rate of return on variable costs.

Operating Ratio

The operating ratio was examined to gain insight into the profitability of the firms. This ratio is an indicator of management skill and operating efficiency. In fact, it has been described as probably the most important measure one can use to assess a company's competitive position in its industry (Gates,1993). An Operating ratio less than one indicate a good, efficient, and profitable business.

The operating ratio is calculated as follows: Operating Ratio (OR) = TVC/TR

Return on Sales

Return on Sales (ROS) is simply percentage of the net income to net sales. It is also called the profit margin (or net profit margin). It is a fundamental indication of the overall Profitability of the business as it measures the percentage net profit per one naira of sales. It gives insight into management's ability to control the income statement items of revenue, cost, and expense (Lasher, 1997). A Profitability index above zero indicates a profitable business. Profitability Index (PI) or return on sale = NI/TR

Rate of Return on Investment

Return on Investment (ROI) is represented as a ratio of the expected financial gains (benefits) of a project divided by its total costs. It takes an ROI ratio greater than zero for a program to be attractive, typically. The rate of return on Investment (RRI) = (NI/TC) *100

Results and Discussion

Profile of the agribusinesses supported by the APPEALS project

The descriptive statistical analysis of the business profile of the enterprises supported by Cross River State APPEALS project is presented in Table 1. Eighty two percent of the enterprises had less than 3 employees while about 5 percent had 6 staff and above on the permanent payroll with 3 as the mean number of employees of the enterprises suggesting the classification of the enterprises as Micro and Small-scale enterprises in terms of number of employees. The result also showed that more than half of the enterprises had existed for over 11 years (50.4 percent), followed by those that were 6 – 10 years old (27.1 percent) and those that were above 15 years old (13.0 percent), which is an indication that they are still in business even after intervention by APPEALS donor support project a pointer of a going concern. In terms of form of business, the result showed that, 69.3 percent were into Cooperatives while 30.7 percent were Sole proprietorship agribusinesses which are in line with the donor project objective of bringing smaller farmers together to enhance their scale of operation and intervened in SMEs own by individuals that can go into business alliances with smaller farmers.

In terms of average monthly revenue of the enterprises as presented in Table 1, 63.7 percent monthly inflow is above one million five hundred thousand naira (₦1, 500,000.00), about 33 percent of the enterprises monthly inflow ranges between five hundred thousand naira (₦500,000.00) to one million five hundred thousand naira (₦1,500,000.00), while 3.6 percent had less than five hundred thousand naira (₦500,000.00) implying that, the scale of the enterprises supported by APPEALS project to be small scale enterprises. About 60 percent of the enterprises spent less than fifty thousand naira for monthly salary, 32.5 percent spent about fifty to hundred thousand naira and 2.3 percent spent above one hundred and fifty thousand naira monthly on salary. Taking into consideration of average number of 3 employees in the result, it implies that labour is cheap in the area of study or probably the employees are mostly unskilled workers. The result in table 4 showed that 96.2 percent of the respondents got the intervention when their businesses needed to be injected with funds showing the timeliness in APPEALS project support to the enterprises. Table 1 results also showed that 61.4 percent of the businesses were not prone to security threat while 39.6 percent were opened to many forms of security threat such as theft, communal clashes, banditry etc.

The result also showed that, majority of the managers (86.2 percent) had tertiary education mostly OND/NCE holders suggesting that, middle manpower was mostly involved in

the running of the enterprises due to the scale of operation and more of hands- on- the plough managers rather than white collar managers hence, the growth and sustainability of the enterprises.

According to the findings presented in Table 1, 74.7 percent of the managers annual personal income was above two million naira, only about 25 percent annual personal income lies between five hundred thousand to two million naira, while 0.8 percent earns less than five hundred thousand naira suggesting that, most of the enterprises are own and run by the managers who are direct beneficiaries of the enterprise net profit. The result in the Table 1 showed that, average household size of the managers was 5, implying minimal impact on the finances of the enterprises and personal emolument due to income dependents. About 73 percent of the mangers were married, 13.3 percent were single while about 14 percent had one form of marital issues or the other. The findings also showed that about 70 percent of the managers had their lineage of running such enterprises connected with their relatives such as brothers, sisters, parents, grandparents and uncles, indicating a long-standing passion of involvement in agribusinesses within the family cycle.

Focused discussion in the field revealed that grant support from donor support partners came in form of inputs and technologies relevant to the enterprises. Major inputs and technologies to enhance productivity includes Production enhancement technologies such as day-old chicks, point of lay, assorted feeds, rice seeds, herbicides, fungicides, insecticides and vaccines. Value addition technologies such as feathers plucking machines, blast freezers, rice milling machines, de-stoners, sorting machines, branded bags and cocoa bread baking machines. The timeliness in the support had impacted on the factors of production in terms of capital acquisition; this further reduced the cost of production. The findings also revealed that, the consideration of managerial experience of the enterprises was a priority, however, as part of the effort to compliment the experiences of managers and other operational employees, specialized trainings such as group dynamics, good agronomic practices, best management practices, standard operational procedure for products standardization, record keeping, biosecurity & environmental management have been conducted, the various trainings have enhanced their business performances. Some of the findings on business profiles of the enterprises supported by APPEALS project in Cross River State were similar with socio economic characteristics of respondents in Nakyejwe *et al.,* (2021) studies on assessment of Sustainable entrepreneurship of small businesses in Uganda and Soto-Acosta *et al.,* (2016) findings on Sustainable Entrepreneurship in SMEs.

Cost & returns analysis of APPEALS production enterprises

The estimates of the average annual costs and returns of rice per hectare, broilers per 500 birds and cocoa per hectare are presented in Tables 2, 3 and 4. The estimated cost and returns of the enterprises supported by the donor agency on the average were ₦481,712.67 and ₦645,050.00 for rice, ₦2,228,938.38 and ₦ 3,048,500.00 for broilers and ₦2,229,492.93 and ₦3,627,389.19 for cocoa production enterprises. Among the average total cost incurred by these enterprises per hectare, labour cost (₦311,690.14) constituted the bulk of the average total cost of rice enterprise and accounted for 64.70 percent of the average total cost. Similarly, for a batch of 500 broilers enterprise, the cost of feed (₦1,423,421.08) constituted the bulk of the average total cost and accounted for 63.861 percent of the average total cost. For cocoa enterprise, rent on farm (₦1,571,111.11) constitutes the bulk of the average total cost and accounted for 70.46 percent of the average total cost. The findings in this work are in line with previous studies by Adewunmi *et*

al. (2022) where feed cost accounted for the highest cost. The variable cost accounted for 89.46 percent, 97.66 percent and 29.53 percent of the average total cost of production in rice, poultry and cocoa enterprises, respectively.

Table 1
Profile of agribusinesses supported by APPEALS project

Variable		Frequency	Percentage	Mean
No of employees	≤3	319	81.6	
	4-6	51	13.0	
	>6	21	5.4	
	Total	391	100	3
Age of Business Enterprises	≤5	37	9.5	
	6-10	106	27.1	
	11-15	197	50.4	
	>15	51	13.0	
	Total	391	100	11.35
Form of Business	Cooperative	271	69.3	
	Sole proprietorship	120	30.7	
	Total	391	100	
Ave. monthly revenue (₦)	≤ 500,000	14	3.6	
	500,001-1,000,000	63	16.1	
	1,000,001-1,500,000	65	16.6	
	>1,500,000	249	63.7	
	Total	391	100.0	3036284.83
Expenditure on Salary (₦)	≤50,000	235	60.1	
	50,001-100,000	127	32.5	
	100,001-150,000	20	5.1	
	>150,000	9	2.3	
	Total	391	100.0	49079.28
Timeliness of Grant Support	No	15	3.8	
	Yes	376	96.2	
	Total	391	100.0	
Security threat	Yes	155	39.6	
	No	236	61.4	
	Total	391	100	
Manager Experience	≤5 years	202	51.7	
	6-10 years	144	36.8	
	11-15 years	23	5.9	
	>15 years	22	5.6	
	Total	391	100	6.63
Manager Sex	Male	279	71.4	
	Female	112	28.6	

Variable		Frequency	Percentage	Mean
Age of Manager	≤30	46	11.8	
	31-40	150	38.4	
	41-50	127	32.5	
	51-60	60	15.3	
	>60	8	2.0	
	Total	391	100.0	42.29
Education Status of Manager	M.Sc	26	6.6	
	BSC	110	28.1	
	OND	201	51.4	
	SSC	51	13.0	
	FSLC	3	0.8	
	Total	391	100.0	
Annual Personal income of Manager(₦)	≤ 500,000	3	.8	
	500,001-1,000,000	25	6.4	
	1,000,001-1,500,000	37	9.5	
	1,500,001-2,000,000	34	8.7	
	>2,000,000	292	74.7	
	Total	391	100.0	14168823.5294
Household size of Manager	<5	257	65.7	
	6-10	132	33.8	
	>10	2	.5	
	Total	391	100.0	5.12
Marital status	Single	52	13.3	
	Married	284	72.6	
	Divorce	20	5.1	
	Separated	21	5.4	
	Widower	14	3.6	
Managerial lineage	Brother/Sister	115	29.4	
	Father/Mother	143	36.6	
	Grandparents	8	2.0	
	Uncle	7	1.8	
	None	118	30.2	
	Total	391	100.0	

Source: Field data analysis, 2024

Furthermore, from the result, it was revealed that, the agribusiness enterprises made an average gross margin per hectare of ₦ 214,111.97 and net income of ₦163,337.33 for rice enterprises. For broilers enterprises, the average gross margin per batch of 500 birds was ₦871,648.11 and net income of ₦819,561.62 was realized, while for cocoa production, the average gross margin per hectare of ₦2,969,007.36 and net income of ₦1,397,896.26 was obtained. The profit margin percentage 25.3 percent, 26.9 percent and 38.5 percent were obtained for rice, broilers and cocoa, respectively, while the rate of return on investment of

0.339, 0.627 and 0.368 for rice, cocoa and broilers were realized. This implies that for every one naira invested across the three commodities,

Table 2
Cost & returns analysis of rice production enterprises per Ha

Item	Average Amount (₦)	% of total Cost
Variable cost		
Rice seed/seedlings	38,339.446	7.96
Agro-chemical	35,845.070	7.44
Fertilizer	45,063.380	9.35
Labour	311,690.140	64.70
Total variable cost	430,938.026	89.46
Fixed cost		
Land Rent	50,774.64	10.54
Total cost	481,712.666	
Revenue (₦)		
Quantity harvested(50kg) / ha	12.901	
Average price per 50 kg bag	50,000	
Total Revenue	645,050.00	
Gross Margin (GM) = TR –TVC	214,111.974	
Net Farm Income (NFI) = TR-TC	163,337.334	
Farm Financial Ratio		
Rate of return per naira investment (NI/TC)	0.339	
Profitability index (NI/GM)	0.763	
Profit margin = NI/TR	0.253	
Operating expense ratio = TVC/TR	0.668	

Source: Field data analysis, 2024

A profit of ₦ 0.34, ₦ 0.63 and ₦ 0.37 were achieved for each hectares of rice and cocoa as well as for every batch of 500 birds respectively.

Similar study investigated by Phiri *et al*., (2023) who analysed the factors affecting farmers' profitability in Mutare district, Manicaland Province, Zimbabwe found that feed costs constituted 56.8 percent of the total variable costs, and small-scale broiler production in this area was a profitable venture with ha mean gross margin of US$ 65.25 per batch of 100 broilers and a return per dollar variable costs invested of $1.15. Similar study by Adewumi *et al*., (2022) in Irepodun local government area of Kwara state, Nigeria, showed poultry farming to be profitable with a gross margin, net farm income and gross ratio of ₦204,692.76, ₦193,492.78 and 0.4923, respectively. This result is also similar to those of Bamiro *et al*. (2015) and Adewumi et al. (2021) who reported on the profitability of livestock farming in Nigeria. Also, Several studies including Al-Mamum *et al*., (2013), Emokado and Eweka (2015), Zimunya and Dube (2021) have utilized gross margin analysis in assessing the profitability of agribusiness enterprises.

Table 3
Cost & returns analysis of broilers production enterprises per 500birds

Item	Average Amount (₦)	% of total Cost
Variable cost		
Feed	1,423,421.081	63.861
Day Old Chicks	350,733.513	15.755
Drugs/vaccines	7,894.594	0.354
Labour	198,562.16	8.888
Water	196,240.540	8.806
Total variable cost	2,176,851.89	97.663
Fixed cost		
Housing Rent	52,086.486	2.336
Total cost	2,228,938.38	
Revenue (₦)		
Ave. No of mature chicken / farm unit	500	
Average price per chicken/6weeks	6097	
Total Revenue	3,048,500	
Gross Margin (GM) = TR – TVC	871,648.11	
Net Farm Income (NFI) = TR-TC	819,561.62	
Farm Financial Ratio		
Rate of return per naira investment (NI/TC)	0.368	
Profitability index (NI/GM)	0.940	
Profit margin = NI/TR	0.269	
Operating expense ratio = TVC/TR	0.713	

Source: Field data analysis, 2024

Table 4
Cost & returns analysis of cocoa production enterprise per Ha

Item	Average Amount (₦)	% of total Cost
Variable cost		
Agro-chemical	18,622.222	0.835
Fertilizer	24,866.666	1.115
Haulage	329,181.818	14.764
Labour	285,711.111	12.815
Total variable cost	658,381.818	29.530
Fixed cost		
Farm Rent /year	1,571,111.111	70.469
Total cost	2,229,492.929	
Revenue (₦)		
Dry cocoa bean harvested(kg) / ha	846.18	
Average price per kg of dry cocoa bean	4286.782	
Total Revenue	3,627,389.178	
Gross Margin (GM) = TR –TVC	2,969,007.359	
Net Farm Income (NFI) = TR-TC	1,397,896.248	
Farm Financial Ratio		
Rate of return per naira investment (NI/TC)	0.627	
Profitability index (NI/GM)	0.471	
Profit margin = NI/TR	0.385	
Operating expense ratio = TVC/TR	0.181	

Source: Field data analysis, 2024

Conclusion

The results from the analysis of agribusinesses supported by the APPEALS project in Cross River State indicate a positive and targeted intervention in promoting the growth and sustainability of producers enterprises. The dominance of cooperative structures over sole proprietorships aligns with the project's objective of fostering collaborative and scalable agribusiness operations. A substantial proportion of these businesses reported significant monthly revenue inflows, suggesting that the project support enhanced enterprise performance. The demographic and educational profile of the enterprise managers predominantly tertiary-educated, married individuals from agribusiness-inclined families underscores a level of managerial competence and deep-rooted commitment to agricultural enterprise. The timeliness of APPEALS support was also critical, with 96.2% of respondents indicating they received intervention at crucial points. From the cost and returns analysis, the three enterprises rice, broilers, and cocoa proved to be economically viable, with positive net incomes and gross margins. High variable costs, especially in feed and labor, were consistent with trends observed in related studies, yet profitability remained strong across all enterprises. These outcomes affirm the importance of continued investment in agribusiness support programs to stimulate rural economies and enhance food security through productive and sustainable enterprise development.

Recommendations

Given that most enterprises are micro and small-scale with an average of only three employees and minimal salary expenditure, there is a need for capacity building in skilled labour and managerial professionalism. Government and donor agencies should promote the formalization of these businesses and invest in vocational and technical training programs. Strengthening human capital with targeted support in bookkeeping, product standardization, and advanced agronomic practices will enhance enterprise scalability, profitability, and long-term sustainability.

The analysis revealed that key cost components such as feed for broilers and rent for cocoa significantly impact total production expenses. To improve profitability and reduce production costs, it is recommended that the APPEALS project and stakeholders facilitate access to subsidized or locally produced high-quality inputs. Additionally, supporting the formation of input cooperatives and community-based input centers can help farmers negotiate better prices and ensure consistent input availability, thereby increasing efficiency and return on investment.

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