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Evaluation of Profitability and Cost-effectiveness of Rice Seeds Production among the Beneficiaries of KSADP/SAA in Kano State, Nigeria

*Ahmad Alhassan[1], Ahmad Usman Shu'aib[1], Umar Shehu Umar[1], Farouk Shehu Abdulwahab[1] and Buhari Nazifi[2].

[1]Department of Agricultural Economics and Extension, ADUSTECH, Wudil, Kano State
[2]Department Agricultural Economics, Federal University, Dutsinma, Katsina State
Correspondence: a.ahmadsumaila@gmail.com,

Abstract
This study was conducted to evaluate performance of rice seeds production among the beneficiaries of KSADP/SAA in Kano State. 156 community-based seed multipliers were randomly selected from 21 Local Government of Kano State. Structured questionnaire were used with the aid of android app kobocollect to collect the data for this study. Descriptive statistics, Cost estimation, Net profit, Operational ratio and Benefit cost ratio were used in the analysis of the data for this study. The study showed that seeds producers had a mean age of 45.27 years. Almost all (98.72% and 98.08%) of the respondents were males and married with a mean household size of 12. It was also found that 84.72% of them had a form of formal education and a mean years of experience in seeds production of 5.35 years. The results further revealed an average total cost of rice seeds production/ha of NGN571, 158.11. The revenue generated was NGN1, 743, 000.54 for with a net profit of NGN1, 171, 842.43. The return on investment on rice seeds production was 2.05. While the operational ratio was 0.29. The major challenges to rice seeds production were pest and diseases, unfavorable climatic condition and high transportation cost. It is concluded that rice seed production was profitable and cost-effective. It is recommended that researchers should refocus on development of high quality seeds that are resistant to drought and pest and diseases.

Keywords: *Profitability, rice, seeds, beneficiaries and Kano.*

Introduction

Agriculture is strategic to the Nigerian economy and plays a significant role of supplying food for the population, raw materials for industries, earning of high foreign exchange which is next only to that from crude oil, providing market for the industrial sector and a key contributor to wealth creation and poverty alleviation (National Seeds Policy (NSP), 2014). However, it is widely acknowledged that the most crucial tactic for increasing agricultural output and hastening the implementation of the National Food Security Programme is the deployment of higher quality crop cultivars by farmers for profitable farming (Ruma, 2008). Seed is widely considered as an essential ingredient for productive crop development. Farmers need enough high-quality seeds at the proper timing and cost to increase productivity (Umar, Sanni, Usman and Shu'aib, 2014). High-quality seeds help farmers meet their goals of increasing crop output and other applications (Chijoke and Akaninyene, 2019) and should be made readily available and effectively utilized to raise the standard of living of rural people and their income as well (Sapkota et al, 2018)

Therefore, as an alternative to the formal seed industry for distributing novel crop types, community-based informal seed manufacturing has grown in favour recently. This is due to the fact that most farmers can more easily get and afford farmer-produced seed than certified seed (Katuingi *et al*, 2011). To ensure regular supply of quality seeds at affordable price and poverty free society, some farmers were trained as community based seeds multipliers for which this study intended to describe the demographic variables, estimate the cost, revenue and profitability of rice seeds production and the possible challenges affecting rice seed production.

Methodology

Study Area

The survey area is Kano State, Nigeria. The State occupies an area of about 20,760 square kilometers out of which about 1,754,200 hectares of agricultural land and over 92,250 hectares of forest vegetation with a projected population of 13,969,085 (Male: 7,124,234 and Female: 6,844,852) (NPC, 2021). Kano State is located between latitudes 10˚ 30´N and 13˚02´N, and longitudes 8˚ 45´E and 12˚ 05´E. The State has a temperature ranging between 14.2˚C in January to about 40.3˚C in April being the warmest month with annual rainfall of 617mm. Relative humidity is high up to 80% in August, which drops to 23% in December and January. Two (2) major systems of crop production have been seen to be practiced in the State: the rain-fed and irrigation. Kano State is bordered by the States of Jigawa to the north and east, Bauchi to the southeast, Kaduna to the southwest, and Katsina to the northwest.

Sampling Procedure

Multi stage sampling technique was employed to select the respondents, in consideration of the SAA area of coverage and the seeds companies' area of coverage as well across gender. In the first stage, twenty-one (21) Local Government Areas of the State were purposively selected based on the intensity and preponderance of the beneficiaries of the SAA/KSADP. The LGAs selected include: Kura, Garunmallam, Tudunwada, Kumbotso, Gwarzo, Rogo, Danbatta, Kunchi, Tsanyawa, Dawakin Tofa, Bagwai, Kabo, Rimin Gado, Tofa, Minjibir, Ungoggo, Wudil, Warawa, Gezawa, Takai and Sumaila. List of the community-based seeds multiplication was sought from SAA. In the second stage, the sample frame obtained was used to generate the sample size by subjecting it to one of the Social Science research scientific sampling calculators that is Raosoft sample size calculator, at 95% confidence level and determined the sample size of 156 respondents. In the third stage, Simple Random Sampling was used to come up with the respondents.

Method of Data Collection

The data for this survey were obtained with the aid of structured questionnaire by well-trained enumerators in an android application kobocollect. Some of the information elicited include socioeconomic characteristics of the rice seeds producers (beneficiaries), costs of inputs used and output sold and the challenges encountered in rice seeds production.

Analytical Techniques

The analytical tools used in the analysis of the data for this study include descriptive statistics, cost and return estimation, net profit, operating ratio, benefit cost ratio and return on investment.

i. Cost estimation

Total cost = TVC + TFC …….... ……. (Equation 1)

Where:

TVC =Total Variable Cost associated with the seed multiplication (cost of seed, labour cost, watering, packaging etc) (₦)

TFC = Total fixed cost (₦)

ii. Return/total revenue generated

Total revenue (TR) represents the total income that farmers receive from selling the seeds to farmers. It comprises of the followings:

(i) Cash income is the value of sold products received in cash.

(ii) In-kind income is the value of the seeds for own usage, for charity or gift

TR = ∑ (income inflow in cash and in-kind)

Where: TR = Total Revenue (₦)

∑ = summation

iii. Net Profit

Net profit = TR – TC ……... (Equation 2)

Where:

TR = Total Revenue (₦)

TC = Total Cost of Seeds production/ha (₦)

iv. Benefit-Cost Ratio

Benefit-Cost Ratio (B/C ratio) is calculated by dividing the total present value of income earned after the activity by the total costs spent during the seed multiplication. The higher the value of operating ratio, the higher the profit margin. Hence, positive BC-ratio is always desirable and most recommended.

$$\text{Benefit} - \text{Cost Ratio (B/C ratio)} = \frac{\text{Total revenue}}{\text{Total costs}} \quad \text{……..... (Equation 4)}$$

v. Return On Investment (Return Per Naira Invested)

$$\text{ROI} = \frac{\text{Net profit}}{\text{Total cost}} \quad \text{……..... (Equation 5)}$$

Where: ROI = return on investment = return per Naira invested (₦)

vi. Operating Ratio

Operating Ratio: According to Eze *et al*., 2021, Operating Ratio measures how much profit is made after paying for variable cost. It is calculated using:

$$\text{OR} = \frac{\text{TVC}}{\text{TR}} \quad \text{……..... (Equation 3)}$$

Where: OR = Operating Ratio

TVC = Total Variable Cost associated with seed multiplication business

TR = Total Revenue generated after selling the seed produced

Results And Discussion

Socioeconomic Characteristics of CBSM Beneficiaries

The results of the socioeconomic characteristics of the community-based seeds multiplication beneficiaries are presented in Table 1 below:

Table 1: Socioeconomic characteristics of Community-based seeds multiplication beneficiaries

Variable	Category	Frequency	Percentage	Mean
Age of the CBSM beneficiaries				
	25 – 33	9	5.77	47.27
	34 – 42	44	28.21	
	43 – 51	56	35.90	
	52 – 60	40	25.64	
	61 – 69	7	4.49	
Gender of the beneficiaries				
	Male	154	98.72	
	Female	2	1.28	
Marital status				
	Single	3	1.92	
	Married	153	98.08	
Household size				
	1 – 8	49	31.41	12
	9 – 16	76	48.72	
	17 – 24	18	11.54	
	25 – 32	10	6.41	
	33 – 40	3	1.92	
Years of experience in seeds multiplication				
	1 – 5	109	69.87	5.35
	6 – 10	27	17.31	
	11 – 15	8	5.13	
	16 – 20	4	2.56	
	21 – 25	8	5.17	
Total		**156**	**100**	

Source: Survey data, 2023

Age of the CBSM beneficiaries: The results in Table 1 revealed that most (90%) of the CBSM beneficiaries were within the age group of 34 – 60 years, with average age of 47.27 years. This implies that majority of the CBSM beneficiaries of SAA/KSADP intervention were relatively young, agile with physical and mental ability to undertake seed multiplication enterprise as a business in the study area.

Gender and marital status of the beneficiaries: The results in Table 1 also showed that majority (98.72%) of the beneficiaries were males while the remaining 1.28 % were females. This indicated that seeds multiplication is male dominant and therefore, the CBSM program is highly gender biased, the need for incorporating many women is paramount as the business is very lucrative and therefore, alleviate poverty among gender. This finding agrees with Sakpota *et al*., 2017 who found that majority (74.2%) of maize seeds producers in Palpa District of Nepal were male. It was also found from the survey that majority (98.08%) were married.

Household size of the beneficiaries: Moreover, majority (80 %) of the CBSM beneficiaries had a household size of 1 -16 persons, with a mean household size of 12 denoting that the beneficiaries had a large household which is far greater than the national average of 5. It is obvious that large household size serves as a source of family labour which as a result, reduces cost of production and increase in the net income of the business.

Years of experience of the CBSM beneficiaries: The results in Table 1 further revealed that majority (70 %) of the beneficiaries had an experience of 1 – 5 years of seeds production, with an average experience of 5.35 years. This implies that the beneficiaries had some degree of experience in the business which will help them to have a good mastery of all the operations of the enterprise and to avert any form of risk associated with the enterprise as well.

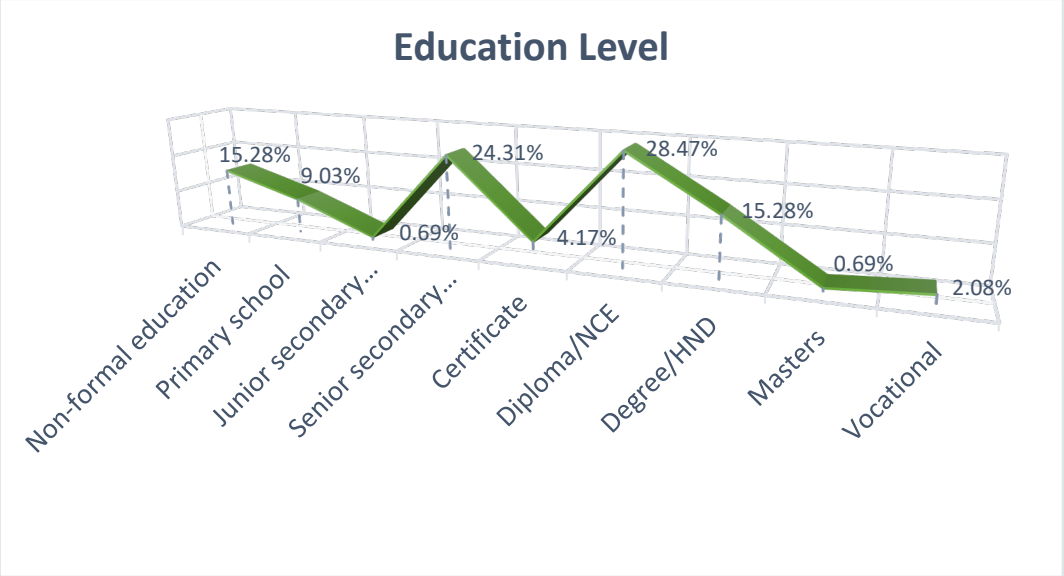

Figure 1: Educational level of the CBSM beneficiaries

Educational level of the beneficiaries: Figure 1 presents the educational level of the CBSM beneficiaries in the study area. 28.47% of them had diploma/NCE, 24.31% had attained SSCE certificate level, 15.28% each had a degree and non-formal education, 9.03% stopped only from primary school, 4.17% had certificate, 2.08% were vocational attendants and 0.69% each had junior secondary school and master's degree. This shows that majority (84.72%) of them had formal education which will assist them in reading instruction on chemical and fertilizer application and also in the adoption of innovation.

Cost Structure and Revenue of Rice Seeds Production among the Beneficiaries of KSADP/SAA in Kano State.

Rice seeds production incurred certain expenses of inputs and cost structure and revenue accrued from sales of rice seed are presented in Table 2 below:

Table 2: Cost structure and revenue of rice seed production among the beneficiaries of KSADP/SAA of Kano State

Rice seeds production			
Items	**Quantity (Kg/Ltr)**	**Amount (₦)**	**%TC**
Variable inputs			
Seeds	36.45	28,595.54	5.01
Fertilizer (NPK)	198.5	103,099.71	18.05
Fertilizer (Urea)	2	41,307.70	7.23
Fertilizer (USG)/Organic manure	75.7	26,062.45	4.56
Herbicides	4.71	18,301.69	3.2
Pesticides	2.19	8,710.55	1.53
Seed dress	5.92	1,796.48	0.32
Empty bags	54	14,530.86	2.54
Labour cost		253,703.80	44.42
Transportation cost		17,900	3.13
Loading and unloading		0.00	
Total variable cost		**514,009**	
Fixed inputs			
Depreciation on equipment		1,593.77	0.28
Rent		55,555.56	9.73
Total fixed cost		**57,149.33**	
Total cost of production		**571,158.11**	
Output			
Seeds	48.72	1,736,200.54	
Other grains			
Straw/Stover		6800	
Revenue		**1,743,000.54**	

Source: Survey Data, 2023

The results in Table 2 presents the cost structure and revenue of rice seeds production. The results showed a total cost of ₦571, 158.11 with an average revenue of ₦1, 743, 000.54. The results also revealed that labour constitutes the largest proportion of the total cost of rice seeds production (44.42%), followed by fertilizers (NPK, Urea and USG) which constitutes 29.84% of the total cost. While rent constitutes 9.73% and depreciation on equipment was the insignificant factor of rice seeds production with only 0.28%.

Profitability of Rice Seed Production among the Beneficiaries

Table 3: Profitability of rice seed production among the beneficiaries of KSADP/SAA

Items	Amount (₦)
Revenue	1,743,000.54
Variable cost	514,009
Total cost	571,158.11
Profit margin	67.23%
Net profit	1,171,842.43
Return on investment (RI)	2.05
Benefit cost ratio (BCR)	3.05
Operational ratio (OR)	0.29

Source: Survey Data, 2023

From the results in Table 3, there is an average revenue of ₦1, 743, 000.54 with a total cost of 571, 158.11. The net profit was estimated to be ₦1, 171, 842.43 with a margin of 0.6723 implying that profit constitutes 67.23% of the gross revenue. The benefit cost ratio was 2.05. This shows that for every ₦1 invested in rice seeds multiplication, all things being equal, there is a gross revenue of ₦2.05. The operational ratio of 0.29 implies that operating cost constitutes only 29% of the total revenue generated from rice seeds production while the remaining 71% is available to cover other cost such as interest, rent, premium etc. This shows that rice seeds production among the beneficiaries is cost effective.

Challenges Associated with Rice Seeds Multiplication

The community-based seeds multiplication beneficiaries are faced with various hitches affecting their seeds multiplication activities. The results for these challenges are presented in Figure 2 below:

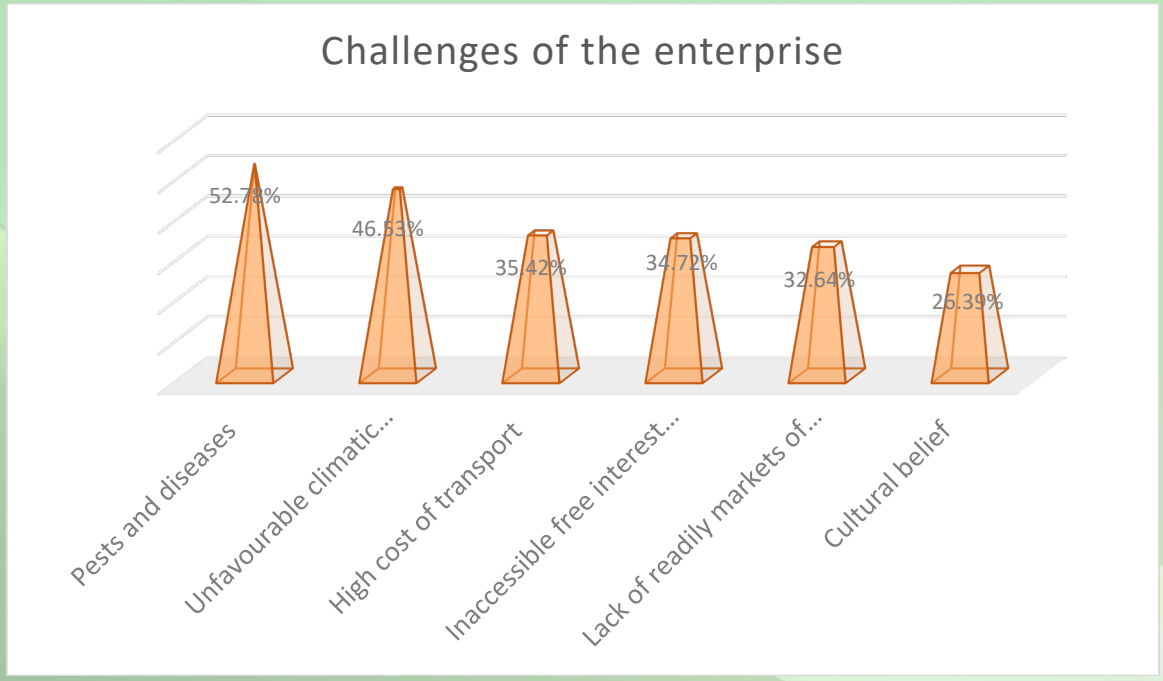

Figure 2: Challenges associated with community-based seeds multiplication (Multiple responses)

The results for the challenges of rice seeds production are presented in Figure 2 above. The results showed that 52.78% of the rice seeds producers (beneficiaries) indicated pests and diseases as one of the challenges affecting their seeds production activities, 46.53% reported unfavorable climatic condition, 35.42% and 34.72% reported high cost of transportation and inaccessible free interest loan respectively as their challenges, 32.64% showed lack of readily market of their product and finally 26.39% indicated cultural belief of the farmers to primitive seeds as their challenges to seeds multiplication enterprise.

Conclusion And Recommendations

Based on the findings of this study it can concluded that rice seeds production among the beneficiaries in the study area is a profitable enterprise and cost effectives. However, the enterprises is challenged by pests and diseases, unreliable climate and high cost of transportation. It is recommended that beneficiaries should adopt integrated pests management and climate smart production and also breeders should develop high quality seeds that are more resistant to pests and diseases and drought tolerant.

References

Chijioke, N. and Akaninyene, U. (2019). Profitability of Improved Seed Adoption on Small Holders Maize Farmers in Abuja Nigeria. Business and Management Studies. 4 (4); 71 – 81. doi:10.11114/bms.v4i4.3922.

Katungi, E., Karanja, D., Wozemba, D., Mutuoki, T. and Rubyogo, J. C. (2011). A Cost-Benefit Analysis of Farmer Based Seed Production for Common Bean in Kenya. *African Crop Science Journal*. 19(4); pp. 409 – 415.

National Seeds Policy (2014). Federal Republic of Nigeria, National Agricultural Seeds Council Abuja, Nigeria, 2014.

Ruma, S. A. (2008). Challenges of the Nigerian seed industry and the way forward. Proceedings of the workshop for public-private partnership for dynamic seed system in Nigeria and West Africa, Abuja, 8th -9 th, October, 2008.

Sapkota, M., Joshi, N. P., Kattel, R. R. and Bajracharya, M. (2018). Profitability and Resource Use Efficiency of Maize Seed Production in Palpa District of Nepal. *SAARC J. Agri.,* 16(1): 157 – 168.

Umar, S., Sanni, S.A., Usman, I. S. and Shuaibu, H. (2014). Community Maize Seed Production as An Income Generating Activity for Poverty Alleviation In Selected Communities of Zamfara State, Nigeria. Proceeding of the 1st International conference on Dryland, Bayero University, Kano 8th – 12th December, 2014. Pp. 164 – 168.