FINANCIAL VIABILITY OF OUTGROWER SEED PRODUCTION IN NORTHWEST AND NORTHCENTRAL NIGERIA

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ABSTRACT
The study was conducted to assess financial viability of outgrower seed production in Northwest and North-central, Nigeria. Multi-stage sampling technique was used to select 394 respondents for the study. Structured questionnaire complemented with interview schedule was employed to collect primary data. Data collected were analysed using farm budgeting techniques. The results showed that rice, maize and soybean seed production enterprises are financially viable for out-growers in North-Central and North-West Nigeria with net return of (₦641,684; ₦671,840), (₦422,060; ₦352,900) and (₦451,500; ₦269,440), respectively although rice and maize showed higher profitability as compared to soybean. The study recommended that Seed companies should offer value-added services such as agronomic advisory, soil testing, and tailored fertilization plans. These services can help farmers make informed decisions, enhancing productivity and consequently, profitability.
KEYWORDS: Financial; Viability; Outgrower; Seed; and Production

INTRODUCTION

Commercial seed companies are major agricultural enterprises that produce and market seeds (foundation seeds and certified seeds). The seed companies are valued at millions of dollars (National Agricultural Seed Council (NASC), 2018). In 2015, the Federal Ministry of Agriculture and Rural Development (FMARD) estimated the value of Nigeria's seed industry to potentially stand at ₦777.4 billion and local production at ₦252.3 billion, thereby leaving a ₦525 billion seed gap (FMARD, 2016). Meanwhile, the latest access to seed index 2019 released by Amsterdam-based Access to Seeds Foundation revealed that Nigeria has about N130 billion in seeds deficit (Veettil *et al.* (2021)). This implies a great opportunity for investment in seed production to meet the identified gap in the seed sector. Also, Nigerian seed companies account for over 60 percent of seeds traded and used in the West African sub-region and some parts of East and Central Africa (NASC, 2018). NASC (2018) describes that the seed industry includes all domestic and foreign seed companies, community-based seed producers, other local seed entrepreneurs, and agro-dealers that engage in the production and/or marketing of quality seed. Over the years, seed companies adopted out-grower schemes to increase their production towards meeting the market demands for improved seeds. The Out-grower schemes can be described as a form of contract farming where the seed companies supply the raw material for the seed production (foundation seeds, breeding lines for hybrid seeds), provide technical assistance, credit, and input services, and then repurchase the seeds at the end of the season under some form of predefined contractual arrangements (Veettil *et al.,* 2021). According to NASC (2018), the Nigeria's total national seed requirements for major crops, including maize and rice, stood at 413,417.64 metric tons (MT) in 2017, however, only half of this demand is

met. Seed companies engage the service of out-grower to augment the gap in what is produced from their seed production fields. More so, given that many seed companies engage smallholder farmers (out-growers) as part of efforts to increase their certified seed production which shows a strong potential for development and linking smallholders to high-value markets, however, many stakeholders have questioned the potential impact of the schemes on the smallholders given the dominant positions of big private sector firms and their ability to extract surplus from local farmers (ActionAid, 2010). There is limited documented evidence to show whether seed companies in the study area provide their contracting farmers with access to inputs, whether the extension services and inputs given under the schemes can improve the input use efficiency of the out-growers. It's based on the foregoing, the study was conducted to examine the economic and financial viability of out-grower seed production systems; and

RESEARCH METHODOLOGY

The study was conducted in selected States within the North West and North Central geopolitical zones of Nigeria. The North Central States are Benue, Kogi, Kwara, Nasarawa, Niger, Plateau, and the Federal Capital Territory (FCT). These States extend roughly from latitude $60^0$50'N to $90^0$30'N of the Equator and longitude $70^0$30'E to $100^0$00'E of the Prime Meridian. The area has a projected population of 22,325,056 million people at 2.5 percent population growth rate (National Population Commission (NPC), (2020)

Sampling Technique and Sample Size

A multistage sampling technique was used to select the respondents (out-growers) for the study.

Methods of Data Collection

Primary data were used for this study; the primary data were collected using structured questionnaires complimented with interview schedules. The collected data were analysed using farm budgeting techniques.

RESULTS AND DISCUSSION

Profitability of Rice, Maize, and Soybean seed (North Central)

Table 1 showed that in rice seed production, variable costs are the largest component, amounting to ₦356,500 per hectare, while fixed costs average ₦256,216 per hectare. NPK fertilizer is the largest expense within variable costs, accounting for 32.5%, followed by labour at 16.8%. Notably, labour costs appear lower, potentially due to the use of unpaid family labour. For maize seed production, the variable cost per hectare is ₦263,950, surpassing fixed costs of ₦152,440. Fertilizer expenses again lead, making up 43.9% of variable costs, followed by labor at 17.9%. The high fertilizer costs reflect recent price hikes, attributed to economic conditions and increased demand. Similarly, soybean seed production shows a high share of variable costs, amounting to ₦224,500 per hectare, with fixed costs at ₦150,190. Fertilizer remains the largest contributor to variable costs at 26.7%, followed by labour at 19.2%. Table 1 also revealed the profitability of these enterprises. For rice seed production, the gross margin is ₦897,900, with a net farm income of ₦641,684 per hectare. The return per variable cost is 3.52, meaning each ₦1 spent yields ₦3.52 in revenue, reflecting strong profitability and efficient resource use. Maize seed production, while less lucrative, still generates a substantial gross margin of ₦574,500 and a net income of ₦422,060 per hectare, with a return of ₦3.18 per ₦1 invested in variable costs, indicating high efficiency. Soybean seed production also remains profitable, with a gross margin of ₦451,500 and net income of ₦301,310 per hectare. The return per variable cost is 3.01, confirming its viability as an agricultural venture. Overall, rice seed production ranks as the most

profitable enterprise, offering the highest return on investment among seed out-growers in North-central Nigeria.

Financial viability of out-growers seed production (North-central)

The financial viability of out-growers seed production in Table 2 revealed that the rate of return on investment was 1.04 for rice, 1.01 for maize and 0.80 for soybean. Similarly, the profitability index was 0.57 for rice, 0.50 for maize, and 0.67 for soybean. In addition, the operating ratio was 0.32 for rice, 0.31 for maize, and 0.50 for soybean while the expenditure structure ratio was 0.72 for rice, 0.58 for maize and 0.67 for soybean. This implies that rice and maize seed production are financially viable with returns on investment slightly above the breakeven point, indicating that for every naira invested, there is a return of ₦1.04 and ₦1.01, respectively

Table 2: Measures of financial viability for Rice, Maize, and Soybean seed (North Central)

Profitability ratios	Rate of Return on Investment RRI=NFI/TC	Profitability index PI=NFI/TR	Operating Ratio OR=TVC/TR	Expense structure Ratio ESR=TFC/TVC
Rice	1.04	0.57	0.32	0.72
Maize	1.01	0.50	0.31	0.58
Soybean	0.80	0.67	0.50	0.67

Source: Field Survey 2023

Profitability of Rice, Maize, and Soybean seed (Northwest)

Table 3 showed the costs and returns to rice production in North-west. The result revealed that, the variable costs constituted the highest share of the costs of production (₦375,700) while fixed cost is ₦275,460 among the rice out-growers farmers in North-west region. Similar to the observation in the North-Central region, the cost of NPK fertilizer accounted for the highest share (30.9%) of variable cost in rice production, this was followed by the cost of labour (21.6%) among the rice producers. Also, under maize seed production, the result shows that the variable costs constituted the highest share of costs of production (₦367,850) while fixed cost was ₦152,140 in the North-west region. Furthermore, the results on soybean seed production shows that the variable costs constituted the highest share of costs of production (₦258,450) while the fixed cost was ₦154,610. However, the cost of labour accounted for the highest share (27.2%) of variable cost followed by the cost of NPK fertilizer (23.2%). Cost of labour and fertilizer were the main contributing factors to the per hectare cost of production. The cost of labour and fertilizer for seed production in Nigeria can vary significantly depending on several factors, including the region, type of crop, and scale of production. (Tahir *et al.*, 2015). Variation in the cost of production among the seed enterprise was noted due to variations in the quantity of inputs used for the different out-grower seed production during entire seasons. This implies that there is a higher demand for labour usage among the farmers in the North-west region than seed farmers in the North-central region. Table 3 also revealed that rice yields the highest gross income per hectare at ₦1,305,000, significantly surpassing maize's ₦872,890 and soybean's ₦682,500. This superior gross income translates into a gross margin of ₦929,300 for rice, compared to ₦505,040 for maize and ₦424,050 for soybean. This demonstrates that rice not only generates higher revenue but also retains more profit after variable costs are deducted.

In terms of net farm income, rice again leads with ₦671,840, indicating strong overall profitability, while maize and soybean yield net incomes of ₦352,900 and ₦269,440, respectively. The return per variable cost is also highest for rice at 3.47, suggesting that for every

naira spent on variable costs, rice farmers receive ₦3.47 in return. Conversely, maize and soybean return less per invested naira, at 2.37 and 2.64, indicating lower efficiency in generating profits. Overall, these results highlight rice as the most economically advantageous crop in the out-grower seed enterprise in the North-West.

Financial viability of out-growers seed production (North-west)

The financial viability of out-growers seed production in Table 4 revealed that the rate of return on investment was 1.06 for rice, 0.71 for maize and 0.65 for soybean. Similarly, the profitability index was 0.51 for rice, 0.41 for maize, and 0.39 for soybean, more so, the operating ratio was 0.29 for rice, 0.40 for maize, and 0.37 for soybean, while the expense structure ratio was 0.69 for rice, 0.41 for maize and 0.60 for soybean. This implies that rice seed production is the most financially viable among the three crops, with an ROI of 1.06, indicating that for every naira invested, there is a return of ₦1.06. Also, The PI for rice (0.51) showed that 51% of total revenue is retained as profit after covering total costs, indicating its financial viability. However, maize (0.41) and soybean (0.39) have lower ratios, suggesting that a smaller portion of their revenues contributes to profit. In addition, the OR for rice (0.29) is considerably lower than that of maize (0.40) and soybean (0.37), indicating that a smaller proportion of total revenue is used as variable costs for rice production. This suggests that rice farming is more efficient and cost-effective in its operational management compared to the other crops. Lastly, the ESR for rice is 0.69, indicating that the fixed costs constitute 69% of the variable costs, suggesting that while rice production involves significant fixed costs, it still manages to maintain profitability. In contrast, maize (0.41) and soybean (0.60) have lower ratios, indicating less reliance on fixed costs, though potentially at the expense of higher operational expenditures.

CONCLUSION AND RECOMMENDATIONS

Based on the findings of the study, it can be concluded that rice, maize and soybean seed production enterprises are financially viable for out-growers in North-Central and North-West Nigeria, although rice and maize demonstrate higher profitability. Also, seed out-growers in both regions are operating with increasing returns to scale; cost of farm size, cost of labour, cost of agrochemicals, cost of seed used and cost of fertilizer were the determinants of cost efficiency, while years of experience and value of credit accessed decreased cost inefficiency. The study recommended that seed companies should offer value-added services such as agronomic advisory, soil testing, and tailored fertilization plans. These services can help farmers make informed decisions, enhancing productivity and consequently, profitability.

Table 4: Measures of financial viability for Rice, Maize, and Soybean seed (North-West)

Profitability ratios	Rate of Return on Investment RRI=NFI/TC	Profitability index PI=NFI/TR	Operating Ratio OR=TVC/TR	Expense structure Ratio ESR=TFC/TVC
Rice	1.06	0.51	0.29	0.69
Maize	0.71	0.41	0.40	0.41
Soybean	0.65	0.39	0.37	0.60

Source: Field Survey 2023

Variables	Rice seed enterprise			Maize seed enterprise			Soybean seed enterprise		
	Quantity/ha	Average unit price	Cost	Quantity/ha	Average unit price	Cost	Quantity/ha	Average unit price	Cost
Variable cost									
Cost of labour	24	2500	60,000	21	2250	47,250	20	2150	43,000
Cost of seed	50kg	450	22,500	20kg	350	7,000	100kg	150	15,000
Cost of NPK fertilizer	4bg	29000	116,000	4bg	29000	116,000	4bg	15000	60,000
Cost of Urea	2bg	26500	53,000	-	-	-	-	-	-
Cost of agrochemicals	4ltr	4500	18,000	3.8kg	4000	15,200	2	16000	32,000
Transportation	1	19000	19,000	1	16000	16,000	1	15500	15,500
Processing (threshing)	1	25000	25,000	1	19500	19,500	1	16000	16,000
Packaging	1	3000	3,000	1	3000	3,000	1	3000	3,000
Cost of hiring a tractor	1	40000	40,000	1	40000	40,000	1	40000	40,000
Total variable cost		**₦149,950**	**₦356,500**		**₦114,100**	**₦263,950**		**₦107,800**	**₦224,500**
Fixed cost									
Cost of land	1ha	10000	10,000	1ha	10000	10,000	1ha	10000	10,000
Storage facility	1unit	24000	24,000	1unit	9580	9,580	1unit	8650	8,650
Cost of hoes	4	2000	8,000	3	2000	6,000	3	2000	6,000
Cost of cutlass	2	2500	5,000	3	2500	7,500	2	2500	5,000
Cost of watering can	2	8000	16,000	1	8000	8,000	2	8000	16,000
Sickle	3	3500	10,500	-	-	-	-	-	-
Wheelbarrow	3	35000	105,000	1	35000	35,000	1	35000	35,000
Cost of knapsack sprayer	2	27600	55,200	2	27600	55,200	2	27600	55,200
Cost of sacks	20	400	8,000	19	400	7,600	15	400	6,000
Cost of rake	3	2500	7,500	2	2500	5,000	2	2500	5,000
Depreciation	-	7,015.5	7,016	-	8560	8,560	-	3340	3,340
Total fixed cost		**₦122,515.5**	**₦256,216**		**₦106,140**	**₦152,440**		**₦99,990**	**₦150,190**
Total cost of production			**₦612,716**			**₦416,390**			**₦374,690**
Gross income from seed/ha	2240kg	560	1,254,400	2045kg	410	838,450	1300kg	520	676,000
Total gross income (GI)			₦1,254,400			₦838,450			₦676,000
Gross margin/ha = GI-TVC			₦897,900			₦574,500			₦451,500
Net farm income = GM-TFC			₦641,684			₦422,060			₦301,310
Return per variable cost = GI/TVC			3.52			3.18			3.01

Source Field survey, 2023

Table 3: Distribution of respondents according to costs of production of the out-grower seed enterprise (North-west)

	Rice seed enterprise			Maize seed enterprise			Soybean seed enterprise		
Variables	Quantity/ha	Average unit price	Cost	Quantity/ha	Average unit price	Cost	Quantity/ha	Average unit price	Cost
Cost of labour	45	1800	81,000	50	2000	100,000	52	1350	70,200
Cost of seed	50kg	500	25,000	30kg	390	11,700	100kg	350	35,000
Cost of NPK fertilizer	4bg	29000	116,000	6bg	29000	174,000	4bg	15000	60,000
Cost of Urea	2bg	26500	53,000	-	-	-	-	-	-
Cost of agrochemicals	4ltr	4200	16,800	3.9kg	4000	15,600	3.9kg	4000	15,600
Transportation	1	16900	16,900	1	15600	15,600	1	11900	11,900
Processing (threshing)	1	26000	26,000	1	10000	10,000	1	25000	25,000
Packaging	1	2500	2,500	1	2450	2,450	1	2250	2,250
Cost of hiring tractor	1	38500	38,500	1	38500	38,500	1	38500	38,500
Total variable cost	1	**₦145,900**	**₦375,700**		**₦101,940**	**₦367850**		**₦98,350**	**₦258,450**
Fixed cost									
Cost of land	1ha	10000	10,000	1ha	10000	10,000	1ha	9500	9,500
Storage facility	1unit	24000	24,000	1unit	9580	9,580	1unit	8650	8,650
Cost of hoes	4	2000	8,000	3	2000	6,000	3	2000	6,000
Cost of cutlass	2	2500	5,000	3	2500	7,500	2	2500	5,000
Cost of watering can	2	8000	16,000	1	8000	8,000	2	8000	16,000
Sickle	3	3500	10,500	-	-	-	-	-	-
Wheel barrow	3	35000	105,000	1	35000	35,000	1	35000	35,000
Cost of knapsack sprayer	2	27600	55,200	2	27600	55,200	2	27600	55,200
Cost of sacks	20	400	8,000	19	400	7,600	15	400	6,000
Cost of rake	3	2500	7,500	2	2500	5,000	2	2500	5,000
Depreciation	-	8,260	8,260	-	8,260	8,260	-	8,260	8,260
Total fixed cost		**₦123,760**	**₦257,460**		**₦105,840**	**₦152,140**		**₦104,410**	**₦154,610**
Total cost of production			**₦633,160**			**₦519,990**			**₦413,060**
Gross income from seed/ha	2250kg	580	1,305 ,000	2129kg	410	872,890	1300kg	525	682,500
Total gross income (GI)			₦1,305,000			₦872,890			₦682,500
Gross margin/ha = GI-TVC			₦929,300			₦505,040			₦424,050
Net farm income = GI-TC			₦671,840			₦352,900			₦269,440
Return per variable cost			3.47			2.37			2.64

REFERENCES

Abdulai, Y., & Al-hassan, S. (2016). Effects of contract farming on small-holder soybean farmers' income in the Eastern corridor of the Northern Region, Ghana. *Journal of Economics and Sustainable Development*. 7(2), 103–113.

Abdulrazaq, M., Ahmed, R., & Musa, A. (2022). Climate and demographic dynamics of North Central Nigeria. *Nigerian Journal of Environmental Studies*, 14(3), 145-156.

ActionAid. (2010). *Who is really fighting hunger? Why the world is going backwards on the right to food*. ActionAid International.

Asala, S. W. & Ebukiba E. S. (2016). Profitability of yam production in Southern Guinea Savanna zone of Nigeria. *Journal of Agricultural Science*. 4(1), 9-14

Federal Ministry of Agriculture and Rural Development (FMARD). (2016). *Nigeria's seed industry: An overview*. Federal Ministry of Agriculture and Rural Development.

Inuwa, A., Aliyu, T., & Garba, S. (2011). Challenges of contract farming in Nigeria: A case of out-grower schemes in selected states. *Agricultural Economics Review*, 23(4), 87-95.

Inuwa, I. M. S., Kyiogwom, U. B., Ala, A. L., Maikasuwa, M. A. & Ibrahim, N. D. (2021). Profitability analysis of rice processing and marketing in Kano State, Nigeria. *Nigerian Journal of Basic and Applied Science.* 19(2), 293-298.

Kliem, L. & Sievers-Glotzbach, S. (2021). Seeds of resilience. The contribution of commons-based plant breeding and seed production to the social-ecological resilience of the agricultural sector. *International Journal of Agricultural Sustainability*, 1-20

Mitra, S., & Sharmin, S. (2019). Risk Attitudes and Financial Profitability of Tomato Farmers-A Study in Bangladesh. *Mitra, S. and Sharmin, S*, 207-217.

National Agricultural Seed Council (NASC). (2018). *Annual report on the seed industry*. NASC.

National Population Commission (NPC). (2020). *Population projections for Nigeria: North Central and North West zones*. NPC.

Njogu, K., Kamau, G., & Wambugu, S. (2017). The socioeconomic impacts of out-grower schemes on smallholder farmers in East Africa. *East African Journal of Agriculture*, 11(2), 67-79.

Sadiq, G., Haq, Z. N., Ali, F., Mahmood, K., Shah, M. & Inamullah, C. (2022). Technical efficiency of maize farmers in various ecological zones of AJK, Sarha *Journal of Agriculture*. 25 (4), 607-610.

Tahir, A., Alkali, D & Saleh, A. (2015). Analysis of Costs and Returns of Sesame Production in Hong Local Government Area, Adamawa State, Nigeria Journal of Agricultural Economics, Environment and Social Science 7(2): 186-193: August, 2021

Veettil, P., Akinbile, L., & Olawoye, J. (2021). Nigeria's seed market deficit: Access to Seed Index insights. *Journal of African Agribusiness*, 17(3), 98-106.

Wendimu, M. A., Henningsen, A., & Gibbon, P. (2016). Sugarcane out-grower schemes and rural incomes in Ethiopia. *Development Policy Review*, 34(3), 297-315