PROFITABILITY OF IMPROVED YAM VARIETIES PRODUCTION AMONG SMALLHOLDER FARMERS IN EBONYI STATE, NIGERIA

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ABSTRACT
This study analyzed the profitability of improved yam varieties production among smallholder farmers in Ebonyi State, Nigeria. A multistage sampling procedure was used to select 216 households involved in yam-based mixed cropping enterprise (comprising 108 under improved yam varieties and 108 under local yam varieties). Structured questionnaire was administered on the respondents. Enterprise budget analysis per hectare and descriptive statistics were used for data analysis. The results showed that the farm enterprise under improved yam varieties is highly profitable recording net farm income of ₦1,573,500 and the benefit cost ratio (BCR) of 1:2.26. The study further revealed that the farm enterprise under local yam varieties recorded lower net farm income of ₦364,200 and BCR of 1:1.38. The results of the sensitivity tests revealed that the improved yam varieties-based enterprise's capacity to withstand sudden changes in input and output prices is substantially profitably stable. The research further showed that lack of finance, high cost of farm inputs, high cost of improved yam seeds and poor or weak extension services among others were ranked as 1st, 2nd, 3rd, and 4thconstraints, respectively to the cultivation of improved yam varieties in the area. The study recommended policy measures aimed at liberalization of agricultural credit to facilitate farmers' access to the required inputs and provision of effective agricultural extension services to farmers among others for increased yields and profitable yam business in Nigeria.
Keywords: improved yam varieties, profitability, enterprise budget, sensitivity test, Nigeria.

I. INTRODUCTION

Africa, unarguably is the fastest growing continent in the world and it is expected that between now and 2050, over 50% of the global population growth would occur in Africa (Oose *et al*., 2019). To avoid exposing this increasing population of African countries to hunger, starvation and poverty or the unsustainable dependence of these countries (Nigeria inclusive) on food imports to feed their citizenry, sustainable transformation of the continent's agricultural economy should be a key imperative. In their eloquent call to African leaders, researchers and development partners to brace themselves up to the challenge of revamping the hitherto enterprising and large scale African agricultural economy which was in past decades reduced to subsistence form by the colonial suzerainty in Africa,Anin (2018) and (Odhimbo 1997) suggested a science-led agriculture with new technologies adapted to optimize resource utilization to cope with production fluctuations and ensure profitable farming. Baba *et al.* (2021), Awoniyi and Awoyinka (2007) asserted that the development of such technologies across various agricultural value chains especially those of the major food and cash crop commodities hold immense potentials in this regard. The authors added that the yam crop occupies a position of pre-eminence in West African sub-region especially Nigeria.

In Nigeria, yam (dioscorea spp) has over the years continued to remain one of the most important staple and cash crop commodities providing food, income and employment opportunities to several millions of both the rural and urban dwellers. (Ume *et al*., 2020; Amusa et al., 2018). Out of the six economically and socially important yam species, three species including Dioscorea rotundata (white yam), Dioscorea alata (water yam) and Dioscorea cayensis (yellow yam)are the most popularly grown species in Nigeria. (Nahanga and Becvarowa, 2015).

The demand for yams by Nigerians is very high as it serves as a major source of energy in the diet providing about 267 calories of Nigeria's energy intake. Yam is consumed in various forms including roasted, fried, boiled and often pounded into fufu and amala (IITA, 2009). High social, cultural and food values are attached to the white yam during title-taking, wedding ceremonies and new yam festivals especially in Southern and North Central regions of Nigeria. Writing on the history and culture of Izzi people who constitute over 30% of the population of Ebonyi, a Southeastern State of Nigeria (the study area), Van-Stenseel (1996) stated, 'To the Izzi people, life is impossible without ji (yam)'.Yam peels serve as livestock feed. In its industrially processed forms including starch and its other derivatives, yam serves as veritable sources of foreign exchange earnings (Ume *et al*., 2020;Nahanga and Becvarowa, 2015). Because of these benefits of yam in Nigeria, incredible increase in area put into its cultivation was recorded and production in the country has been more than tripled over the past 45 years from 6.7 million metric tons in 1961 to 39.3 million metric tons in 2006 (FAO, 2007).

Though Nigeria remains the world's largest producer of yam followed by Ghana, Cote D'Ivoire, Benin Republic, Togo and Cameroon, (FAO, 2013), Ume *et al.*(2020) reported that out of the 2007 world total yam production of 52 million metric tons, Nigeria's share was a little above 37 million tons. This figure (37

million metric tons) represents a significant shortfall when compared to the country's 2006 yam production output of 39.3 million metric tons. Nigeria's yam production figure for 2016 and 2022 stood at 44.1 million metric tons and 61.14 million metric tons respectively (69.3% of 88.23 MMT global yam output) (NBS,2017, FAO, 2023). However, FAO (2023) reported that out of the total global primary crops production of 9.6 billion metric tons in 2022, root and tuber crops came 6th with an output of 0.9 BMT trailing behind cereals (3.1 BMT); sugarcane (2.2 BMT); vegetables (1.2 BMT); oil crops (1.1 BMT) and fruits (0.91 BMT).

Ume et al (2020) and Amusa et al (2018) attributed these yam production fluctuations resulting in Nigeria's domestic production's inability to cope with the ever-increasing domestic consumption demand occasioned by heightened population growth and surplus for the export market to several factors. These factors include socio-economic, policy negligence in several quarters against yam in favour of other staples including rice and cassava as well as technical challenges especially non-availability of improved yam varieties. (Merem *et al.*, 2024; Simpa and Nmadu, 2014). To solve the problem of non-availability of improved yam varieties, the International Institute of Tropical Agriculture (IITA) Ibadan has since 2011 been developing and releasing improved yam varieties having consumer and farmer preferences to farmers for increased yields. (IITA, 2023). This, the Institute does in collaboration with the National Root Crop Research Institute (NRCRI) Umudike with the support of Japan Ministry of Agriculture, Forestry and Fisheries (MAFF-Japan) and the African Yam and RTR Breeding Project funded by Bill and Melinda Gates Foundation. (Emmanuel and Olugboyega, 2024 and Matsumoto, 2024).Such improved varieties from the *Dioscorea rotundata* species include UMUDr36 with commercial nickname of *SharpSharp*; UMUDr33 (TDr 1401220), nicknamed *Blessing,*; UMUDr34 (TDr 1400158) nicknamed *Sunshine*; UMUDr32 nicknamed *Favourit;* UMUDr30 nicknamed *Nagode* and UMUDr29 nicknamed *Super*. Others from *Dioscorea alata* species include UMUDa35 nicknamed *Delight*; UMUDa31 nicknamed *Wonders*; UMUDa28 nicknamed *VaYam* and UMUDa27 nicknamed *Akuabata*. (IITA, 2023; Emmanuel and Olugboyega 2024, Matsumoto, 2024).

IITA, (2023); Baba *et al*. (2021) and Agbarevo, (2013), asserted that although most of the improved yam varieties have been adopted by farmers, the authors argued thatthe adoption is low and attributed this to lack of clarity on the profitability potentials of the improved varieties adding that new technologies can only be massively adopted by smallholder farmers in so far as farm enterprises under such technologies are profitably rewarding and cost of inputs affordable. Udealor and Asiegbu (2006) reported that improved crop (including yam) production technologies significantly increased crop yields. Yet, Agbarevo (2013) maintained that the resource-poor smallholder farmers are mostly unwilling to risk their small capital adopting recommended technologies until the expected benefits and profitability of such technologies are substantially demonstrated in comparison with the local practices. Although there have been attempts to document the issues of the costs and returns of yam production enterprises (Baba et al., 2021; Ume et al.,2020; Amusa et al, 2018, Nahanga and Becbarowa, 2015; Simpa and Nmadu, 2014; Ekrunwe et al, 2008; Awoniyi and Awonyinka, 2007) in Nigeria and Ghana, there has been great variations in input and output prices (key variables in profitability analysis) over time and location. With this conflict in focus, this research was carried out to empirically analyze and document the profitability of improved yam varieties production among smallholder farmers in Ebonyi State of Nigeria. Specifically, the study determined and compared the costs and returns of farm enterprises per hectare using improved yam varieties and those of the farm enterprise per hectare using local or unimproved yam varieties, determined and compared the relative sensitivity of both categories of farm enterprises in relation to their capacity to withstand sudden changes in input and output prices, described the constraints to the cultivation of improved yam varieties in the area and proffered recommendation based on findings.

II. METHODOLOGY

The Study Area

This research was conducted in Ebonyi State of Nigeria. The choice of the state is based on the fact that it is a major food producing area in Southeastern Nigeria and yam production represents one of the major agricultural enterprises of farmers in the State. Ebonyi State which was created out of the former Abia and Enugu States on 1st October, 1996 lies between latitudes $7^0$30'and $8^0$30'N and longitudes $5^0$40', and $6^0$45'E. It hasa landmass of 5, 935 Km^2most of which are fertile and arable (Egwu, 2002).

Over 80% of the State's 2022 population projection of 2006 National Population Census of about 3.4 million people (NPC, 2022) engage in agriculture growing different food and cash crop types especially yam, cassava, rice, maize, citrus, cocoyam, pepper wherein most of these crops except rice are produced through mixed cropping system (The two major mixed cropping systems in the State are; yam-based mixed cropping system and cassava-based mixed cropping system). The farmers also tend small ruminants and keep cattle and pigs (Echiegu, 2002). With the mean annual temperature of 80^0F and mean annual rainfall varying between 2250mm to 2000mm with marked dry season from November to March and rainy season between April and October (Eze and Idoke 1997), the State lies in the tropical rain forest zone best suited for the cultivation of improved yam varieties (IITA, 2023).Ebonyi is made up of thirteen Local

Government Areas divided into three agricultural zones by the Ebonyi State Agricultural Development Programme (EBADEP). The zones are Ebonyi North Zone, Ebonyi Central Zone and Ebonyi South Agricultural Zone.

Sampling and Data Collection

Multistage sampling procedure was employed to select a total of 216 households involved in yam-based mixed cropping enterprise (comprising 108 involved in improved yam varieties-based mixed cropping enterprise and 108 involved in local yam varieties-based mixed cropping enterprise). In the first stage, three local government areas were purposively selected from each of the three agricultural zones in the State to come up to a total of nine LGAs. These LGAs were Abakaliki, Izzi and Ohaukwu LGAs from Ebonyi North Agricultural Zone; Ezza South, Ikwo and Ishielu from Ebonyi Central Agricultural Zone and Afikpo North; Ivo and Onicha LGAs from Ebonyi South Agricultural Zone. The selection of these LGAs was based on the fact that yam is massively produced in the areas and the farmers are adequately exposed and accessible. In the second stage, three autonomous communities were randomly selected from each of the nine LGAs making it a total of twenty seven autonomous communities. In the third and final stage, farmers listing from the three Zonal Offices of Ebonyi State Agricultural Development Programme (EBADEP) was used as sampling frame to randomly select as sample size, four respondents each for farm enterprise under improved yam varieties and farm enterprise under local or traditional yam varieties from each of the 27 communities giving a total of 216 respondents to whom structured questionnaire was administered during the 2022/2023 farming season.

Method of Data Analysis

Net Farm Income (NFI) analysis otherwise referred to as enterprise budget was used to determine and compare the costs and returns of farm enterprise per hectare under improved yam varieties-based farm enterprise and those of farm enterprise per hectare under local or traditional yam varieties in the area. Sensitivity analysis was performed on the gross margins of the two categories of farm enterprises per hectare to estimate and compare the extent to which yam production in the area can withstand unexpected changes in input and output prices under the improved and local yam varieties production systems. Descriptive statistics such as means, frequency, percentages etc. were used to describe the constraints to the cultivation of improved yam varieties in the area.

Model Specification

The Net Farm Income (NFI) or enterprises budget that was employed to determine and compare the profitability of farm enterprise per hectare under improved yam varieties and farm enterprise per hectare under local yam varieties was stated as follows;

NFI= (TR - TVC) – TFC …….. (i)

Where:

NFI = Net Farm Income or Net Profit in Naira

TR = Total Revenue in Naira

TVC = Total Variable Cost in Naira

TFC = Total Fixed Cost in Naira

(TR – TVC) = (Gross Margin GM),

(TVC + TFC = Total Cost (TC).

Benefit Cost Ratio (BCR) = $\frac{TR}{TC}$…….. (ii)

Production Profitability Index (PPI) calculated thus:

PPI = $\frac{NFI}{TC}$ X 100

This form of analysis per hectare was applied to both categories of farm enterprises.Based on some hypothetical assumptions of certain percentage decreases in gross revenues and percentage increases in total variable costs, sensitivity analysis was carried out on the gross margins of the two categories of the farm enterprises per hectare.

III. RESULTS AND DISCUSSION

Costs and Returns Analysis of Improved and Local Yam Varieties-based Production Enterprises

The costs and returns of yam production in the area were analyzed by preparing the enterprise budget per hectare for the improved yam varieties-based mixed cropping enterprise and for the local yam varieties-based mixed cropping enterprise and the results are presented in tables 1 and 2.

Table1:Costs and Returns Per ha of Improved Yam Enterprises:see pg. 20.

Data in Table 1 show that the improved yam varieties-based enterprise has a total revenue (TR) of ₦2, 822,000 per hectare and gross margin of ₦1,703, 500 per hectare. The net farm income (NFI) of the sum of ₦ 1,573,500 represents 126.03% of the total cost of production (₦1,248,500) . Again, the benefit cost ratio (BCR) of 1:2.26 indicates that every one naira invested in the cultivation of one hectare of improved yam varieties-based cropping enterprise in the area resulted in ₦ 2.26 as return on investment (ROI). The improved yam varieties farm enterprise in the area is therefore highly profitable. The findings are in agreement with earlier ones by Amusa et al (2018) who reported that all the production profitability indicesin their study showed that yam production in Abia State of Nigeria is highly profitable. Also Baba et al (2021) found that with the return on investment (ROI) of ₦ 1.67 for every one naira invested, improved yam production technology enterprise in Paikoro Local Government Area of Niger State, Nigeria is highly profitable. The finding is also in agreement with findings by Nwakpu (2024) who reported that farm enterprise by farmers who adopted improved cassava varieties in Ebonyi State Nigeria was highly profitable.

Table 2: Cost and Returns Per Ha of Local Yam Enterprise: see pg. 21.

Data in Table 2 show that the farmenterprise under local yam varietiesrecordedtotal revenue (TR) of is ₦1,325,000, and a gross margin of ₦489,200 per hectare. Itsnet farm income of the sum of ₦364,200 represents 37.91% of the total cost (TC) of production (₦960,800). The benefit cost ratio (BCR) of 1:1.38 indicates that every one naira invested in the production of one hectare of local or traditional yam varieties in the area resulted in ₦1.38 as return on investment (ROI) and the yam enterprise is only mildly profitable.The findings are in agreement with the earlier ones by Simpa *et al.*(2014) and Baba *et al.* (2021) who reported that yam production was profitable in Kogi State and Zang Local Government Area of Taraba State in Nigeria respectively.

Comparative Costs and Returns Analysis

Results of the study in Tables 1 and 2 show that whereas the farm enterprise under the improved yam varieties-based system had a total revenue (TR) of ₦2,822, 000, gross margin (GM) of ₦1,703, 500 with net farm income (NFI) of ₦1,573,500 representing 126.03% of the total cost of production (₦1,242,500) per hectare, the farm enterprise under local yam varieties-based system recorded atotal revenue (TR) of ₦1,325,000. gross margin of ₦489,200 with net farm income (NFI) of ₦364,200 which represents only 37.91% of the total cost of production (₦960,800) per hectare.Whereas the farm enterprise per hectare of improved yam varieties had a benefit cost ratio (BCR) of 1:2.26 implying that every one naira invested resulted in ₦2.26 as return on investment (ROI), that of local yam varieties recorded a benefit cost ratio (BCR) of 1:1.38 implying that every one naira invested per hectare resulted in ₦1.38 as return on investment (ROI). Thus all the profitability indices indicate that the farm enterprise under improved yam varieties-based system in the area was highly much more profitable than that of the local yam varieties-based system which was only slightly profitable. The findings are in agreement with earlier ones by Awoniyi and Awonyinka (2007) who found that farm enterprises by households who cultivated improved yam variety were more profitable than farm enterprises by households who cultivated local yam variety in Kwara State of Nigeria. The findings are also in agreement with Nwakpu (2024, Nwakpu, 2019 Nwakpu *et al.*,2006) and Babaji *et al.* (2019)who reported that farm enterprises under improved agricultural technologies were more profitable than those of the farmers who stuck to the old orlocal unimproved technologies. All these are in tune with Okeke and Eke-Okoro (2006) and Nwosu (2005) who asserted that a positive correlation existed between adoption of improved crop production technologies and increased yields. This comparison between improved yam varieties and local ones also well aligns with Agbarevo (2013) who earlier opined that smallholder farmers can only risk their small capital adopting new technologies when the expected benefits and profitability of such innovations are substantially demonstrated in comparison with the local practices.

Sensitivity or Risk Analysis

Sensitivity tests based on the hypothetical assumptions that the total revenues(TR) and total variable costs(TVC) of both categories of yam production enterprises in the area changed by certain specific percentages and their effects on the respective gross margins of the two enterprises were conducted. The results which helped to determine the extent to which the farm enterprises can withstand unexpected changes in input and output prices (risk and sustainability issues) are presented in Table 3.

Table 3: Effects of Percentage Changes in the TVC and TR on theGross Margins of the Two Categories of Yam Enterprises: see pg. 22.

Results in Table 3 show that the gross margins of the improved yam varieties-based enterprise per hectare consistently remained positively profitable in all but two occasions of the sensitivity tests when the:

*Total revenue (TR) was decreased by 50% and *Total variable cost (TVC) was increased by 50% and Total Revenue (TR) decreased by 50%

This implies that the improved yam varieties farm enterprise in the area has substantial capacity to withstand unexpected changes in inputs and output prices.

On the other hand, the gross margins of the local yam varieties-based enterprise per hectare remained positively profitable in several incidences of the sensitivity tests but were negative on three occasions when the;

*TR was decreased by 50%, *TVC was increased by 50% and TR decreased by 50% and*TVC was increased by 25% and TR decreased by 25%.

This implies that the local yam varieties farm enterprise profitability index in the area is slightly unstable.

The results show that on comparative basis, the farm enterprise under improved yam varieties has greater capacity to withstand sudden changes in input and output prices in the area than that under local yam varieties. The findings are in agreement with earlier ones by Nwakpu (2024) who found that the profitability index of cassava enterprise using improved cassava varieties was highly profitably stable whereas that of farm enterprise under unimproved or traditional cassava varieties was unstable. Audu et al (2008) reported that farm enterprises using improved crop (rice) technologies in Ankpa Local Government Area of Kogi State, Nigeria was profitably stable.

Constraints to the Cultivation of Improved Yam Varieties

Constraints to the cultivation of improved yam varieties in the area were described in this section. The constraints include; lack of finance, high cost of improvedseed yams (planting materials), poor or weak extension services and high level of illiteracy among others. The results of the analysis are presented in Table 4.

Table 4: Constraints to the Cultivation of Improved Yam Varieties: see pg. 22.

Results in Table 4 show that with 19.44%, 16.67% and 13.89% of the respondents' responses, poor or lack of finance, high cost of farm inputs, and scarcity/high cost of improved yams seeds (planting materials) ranked 1st, 2nd and 3rd, respectively as constraints to the cultivation of improved yam varieties in the area. These were followed by 12.50%, 11.11%, 8.33% and 7.41% of the survey farmers who ranked poor or weak extension services, high level of illiteracy among the farmers, lower dry matter content of the improved yam varieties than the local ones and higher post harvest loses as 4th, 5th, 6th, and 7th constraints respectively. Poor or lack of awareness of improved yam varieties and farmers unwillingness to part with the edible improved yam for planting were respectively ranked as 8th and 9th constraints to the cultivation of improved yam varieties in the area. The findings confirm earlier ones by Awoniyi and Awoyinka (2007) who reported that the reasons for farmers in Kwara State, Nigeria not cultivating improved yam varieties include; scarcity and high cost of improved yam varieties, lack of awareness of farmers and poor technical know-how among others. Lawal *et al*. (2018) also found that scarcity and high cost of improved varieties, lack of finance etc. were constraints to the adoption of improved cassava varieties in Gwazo Local Government Area of Kano State, Nigeria. Similarly Nwakpu (2024) reported that poor finance, scarcity and high cost of farm inputs among others were constraints to the adoption of technologies on improved cassava varieties in Ebonyi State of Nigeria.

IV CONCLUSION AND RECOMMENDATIONS

All the profitability indices revealed that the farm enterprise under improved yam varieties is highly profitable. For instance, every one naira invested in the enterprise per hectare earned ₦ 2.26 as return on investment whereas every one naira invested in the farm enterprise under local yam varieties per hectare earned ₦1.38 as return on investment. The sensitivity tests further revealed that the enterprise under improved yam varieties showed immense capacity to withstand unexpected changes in input and output prices. The study therefore recommended policy, measures aimed at liberalization of agric credit to facilitate farmers' access to the required inputs and provision by relevant institutions of effective agricultural extension services to farmers on improved technologies for increased yields and profitable farming in Nigeria.

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Table 1: Cost and Returns Per Hectare of Improved Yam Varieties-based Enterprise

Items **Variable Costs**	**Qty.**	**Units**	**Units Cost/Price (₦)**	**Total Value (₦)**
Labour	360	Mandays	1, 000	360, 000
Seed yams	2.2	Tons	300, 000	660, 000
Stakes	30	Bundles	250	7, 500
Cassava Sticks	12	Bundles	400	4, 800
Fertilizers	.8	50 Kg Bag	22, 000	17, 600
Agro Chemicals	1	Litre	3, 000	3, 000
|Miscellaneous Cost Inputs			Various	5, 600
Transportation				60, 000
Total Variable Cost (TVC)				1, 118, 500
Fixed Cost (TC)				
Value of land/rent	1 ha			80, 000
Depreciation on tools/equipment				40, 000
Interest on loans				10, 000
Total Fixed Cost (TFC)				130, 000
Total Cost (TC)				1, 248, 500
Gross Farm Income (GFI)				
Yam Tubers	11.8	Tons	220, 000	2, 596, 000
Cassava Tubers	1.2	Tons	130, 000	156, 000
Minor Crops	120	Kg	500	60,000
Cassava sticks	20	Bundles	500	10,000
Total Revenue (TR)				2,822,000
Profitability Indices				
Total Revenue (TR)				2, 822, 000
Gross Margin (GM)				1, 703, 500
Net Farm Income (NFI)				1, 573, 500
Prod. Profit. Index (PPI)				126.03%
Benefit Cost Ratio (BCR)				1:2.26
ROI per ₦				₦ 2:26

Source: Field Survey 2020/2023 Cropping Season.

Table 2: Cost and Returns Per Ha of Local Yam Enterprise

Items **Variable Costs**	**Qty**	**Units**	**Units Cost/ Price (₦)**	**Total Value (₦)**
Labour	400	Mandays	800	320, 000
Yam Sets	2.0	Tons	230, 000	460, 000
Stakes	28	Bundles	250	7, 000
Cassava Stems	20	Bundles	300	6, 000
Miscellaneous Inputs			Lump	2, 800
Transportation			Lump	40, 000
Total Variable Cost (TVC)				835, 800
Fixed Costs				
Value of Land/rent	1	Hectare		75, 000
Depreciation on tools/equipment			Various-Lump	50, 000

Total Fixed Cost (TFC)				125, 000
Total Costs (TC)				960, 800
Gross Farm Income (GFI)				
Yam Tubers	7.1	Tons	170, 000	1, 207, 000
Cassava Tubers	800	Kg	100	80, 000
Minor Crops	70	Kg	500	35, 000
Cassava Stems	10	Bundles	300	3, 000
Total Revenue (TR)				1, 325, 000
Profitability Indices				
Total Revenue				1, 325, 000
Gross Margin (GM)				489, 200
Net Farm Income (NFI)				364, 200
Production Profit. Index (PPI)				37.91%
Benefit Cost Ratio (BCR)				1:1.38
Return on Invest. (ROI) per ₦				₦1.38

Source Field Survey: 2022/2023 Cropping Season.

Table 3: Effects of Percentage Changes in the TVC and TR on theGross Margins of the Two Categories of Yam Enterprises.

S/N	(Variations) %age Changes	Effect on GM for: Improved Yam Enterprise ₦	Local Yam Enterprise ₦
1.	No Variation in GM	1,703,500	489,200
2.	No Variation in TR	2,822,000	1,325,000
3.	No Variation in TVC	1,118,500	835,800
4.	50% increase in TVC	1,144,250	71,300
5.	25% increase in TVC	1,423,875	280,250
6.	10% increase in TVC	1,591,650	405,620
7.	50% decrease in TR	-292,500	-173,300
8.	25% decrease in TR	413,000	157,950
9.	10% decrease in TR	836,300	356,700
10.	(4) + (7) above	-266,750	-591,200
11.	(5) + (8) above	718,375	-51,000
12.	(6) + (9) above	1,309,450	273,120
		Substantially Stable	Slightly Unstable

Source: Field Survey 2022/2023 Cropping Season.

Table 4: Constraints to the Cultivation of Improved Yam Varieties

S/N	Constraints	Freq.	%ages	Rank
1.	Poor or lack of finance	42	19.44	1st
2.	High cost of farm inputs	36	16.67	2nd
3.	Scarcity/high cost of improved yam varieties seed yams	30	13.87	3rd
4.	Poor or weak extension services	27	12.50	4th
5.	High illiteracy level among farmers	24	11.11	5th
6.	Lower dry matter content than local yam varieties	18	8.33	6th
7.	Higher post harvest loses	16	7.41	7th
8.	Poor awareness of such varieties	14	6.48	8th
9.	Farmers' unwillingness to part with the edible yam for planting	9	4.17	9th
10.	Technology in consistent with farmers' socio-cultural norms	Nil	Nil	Nil

Source: Field Survey 2022/2023 Cropping Season