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Creating Entreprenurial Opportunity Through Production of Jatropha (*Jatropha curcas*) Seedlings in Osun State, Nigeria

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ABSTRACT

Jatropha (*Jatropha carcus*) cultivation is one of the newly developing crop enterprises in Nigeria due to its potential for the production of renewable energy. Just like any innovation, it has in its trail bundles of yet to be explored entrepreneurial opportunities. The study therefore explored the entrepreneurial potential of producing Jatropha seedlings on the Osun State University Teaching and Research Farm. One thousand (1000) stands of seedlings were raised from Jatropha seeds obtained from NACGRAB farm Iseyin, in the nursery prepared at University Teaching and Research Farm between January and March 2014. Materials such as loamy soil sourced from the surrounding farms; compost manure, farm implements such as cutlass, hoes, hand trowel, soil sieve, shovel, head pan, watering can and wheel barrow were used to raise the seedlings. Hired labour was employed to maintain the nursery. Results showed that, [1]₦47,300.00 (US$294.94), ₦10,811.64 (US$67.41), ₦58,111.64 (US$362.36) were incurred as total variable cost, total fixed cost and total cost, respectively. A stand of the seedling was produced at the rate of ₦58.11, while a net returns of ₦41,883.36 (US$261.17) was obtained. The study indicated that raising of Jatropha seedlings is profitable and this enterprise is recommended as a possible option for entrepreneurial exploit for intending investors and other employment creation institutions.

[1] 1US$ = N160.37average exchange rate available at www.exchangerates.org.uk/USD-NGN-31_12_2013-exchange-rate-history.html accessed 3/05/2015

Keywords: Unemployment, Jatropha, budgetary analysis and seedling production.

INTRODUCTION

According to the National Bureau of Statistics (NBS) Nigeria's population was estimated to be about 167 million people in 2012. The National Population Commission (NPoC, 2013) indicated that about half of this population is made up of youth, defined as individuals between 15 and 34 years of age. Unfortunately, as the youth population grows, so does youth unemployment (Akande, 2014).

Analysis of youth unemployment by geographical/settlement location (rural and urban areas) indicates that youth unemployment is more in the rural areas and rapidly growing. For instance, between 2010 and 2011, the share of unemployed youth in rural areas increased from 47.59 percent to 59.95 percent. The population of unemployed youth in rural areas rose from 2.9 million in 2008 to about 5.9 million in 2012. It is noteworthy that graduates of tertiary institutions also seem to be significantly affected by unemployment too constituting up to about 20 percent of youth unemployment and often remaining unemployed for upward of five years after graduation (NISER, 2013).

Different programmes have been introduced by various administrations in Nigeria over time to address youth unemployment. The interventionary approach by government was to draft unemployed youth to public programmes such as Operation Feed the Nation (OFN) and the Directorate of Food, Road and Rural Infrastructure (DIFRRI), which provided immediate and direct jobs to participants interested in agriculture. However, in the recent past, specifically since the commencement of stable civilian rule in 1999, successive administrations; including the current government have tried to redesign unemployment programmes,

learning from experiences of past unsuccessful programmes to create new ones. Three of the current and most prominent programmes include the Subsidy Reinvestment and Empowerment Programme (SURE-P), the Youth Enterprise With Innovation in Nigeria (YOU-WIN) and the Osun State Youth Employment Scheme (O'YES), among others.

The informal sector of the economy, especially agriculture, still remains an important vehicle of job creation in Nigeria. In quarter four of 2014, a total of 369,485 jobs were created across all sectors of the Nigerian economy. Of these 138,026 or 37.4% were recorded in the formal sector, 4,387 or 1.2% in the public sector while 61.5%; 227,072 jobs were created in the informal sector. While the number of jobs created decreased in the two other sectors in the previous quarter, the jobs created in the informal sector increased by 28,928 jobs representing a 14.6% increase during the same period. (NBS, 2014).

Jatropha production is an emerging area of opportunity for job and wealth creation in the agricultural and energy sectors of Nigeria. Jatropha carcus is a large shrub or small tree belonging to the Euphorbiaceae genus whose cultivation is fast gaining popularity in Nigeria mainly because of its ability to produce oil containing seeds

(Jongschaap et al., 2007 cited in Warra, 2012). Jatropha grows in tropical and sub-tropical regions with cultivation limits at 300N and 350S. It grows in latitude of 0-500meteres above the sea level (FAO, 2010). It can survive with as little as 250 -300mm of annual rainfall, while atleast 600mm are needed to flower and set fruits. The optimum rainfall for seed production is between 1000 – 1500mm (FACT, 2007). Optimum temperatures are between 200C and 280C while very high temperatures can depress yield (Gour, 2006). It is resistant to drought and pests and produces seeds containing 27 – 40 percent oil. Its other agronomic advantages are that it grows on marginal soils; can be used to control erosion and has a life span of 40 – 50 years (Raufu et al., 2014).

The Jatropha economy can be regarded as just evolving in Nigeria and has associated with it a host of yet to be tapped opportunities. Apart from its reputation as provider of energy and economic security, Jatropha offers potential opportunity to address issues of rural livelihood and poverty (Brittaine and Lutaladio, 2010). These opportunities have employment generating potentials and can help to reduce the alarming rate of unemployment in Nigeria. One of such entrepreneurial activities related to the emergence of Jatropha is the raising of its seedlings. However, there is paucity of information on this. This study therefore intends to investigate the cost and return associated with Jatropha seedling production in other to determine its economic viability. This will help in reducing the risk associated with committing scarce resources into the enterprise by intending investors. To this end, this study identified and estimated costs and returns from raising 1000 stands of jatropha seedling at the teaching and research farm of the College of Agriculture, Osun State University, Ejigbo campus.

MATERIALS AND METHODS

Study Area

The study was carried out at the nursery site of Osun State University College of Agriculture, Ejigbo campus. Ejigbo is a portion of Osun state which is situated in the derived savannah vegetation belt of Nigeria. Ejigbo is situated at 7.9° North latitude, 4.32° East longitude and 426 meters elevation above the sea level.

Materials and germination procedure

Materials required to raise 1000 seedlings of Jatropha are; Jatropha seeds, polythene bags, saw dust and organic fertilizer, soil sieve, nursery shed, river sand, watering cans, hoes, cutlass, shovel, rake, hand trowel, head pans, wheel barrow and hired labour.

Loamy soil was sourced from the surrounding farms with the use of hoes, shovel, head pan and wheel barrow. This was mixed with compost manure from the compost unit of the teaching and research farm at ratio 2:1 (loamy soil: compost). This mixture was filled into 1,111 polythene bags of size 4x5cm. These were arranged in rows under the shade prepared for the germination exercise between the 27th and 31st December, 2013. About 1kg of seed from NACGRAB farm Iseyin provenance were sown by burying 1 seed per polythene bag at a depth of about 3 – 5cm and covered lightly with soil. This was carried out between 2nd and 3rd January, 2014. Irrigation was provided with the aid of watering can to enable the soil to maintain field capacity in order to enhance germination appropriately. Weeds that germinated alongside the seedlings were removed manually by hand. This maintenance was carried out from January to march, 2014. Seeds were observed to commence germination at about 5days after sowing. About 90% germination rate was observed. This may be due to precaution that

was taken to prevent delay in sowing seeds immediately after harvesting from the parent plant. Also, nursery shade was gradually removed for hardening of the plants as the nursery operation was approaching the end. In all the nursery operation took about three months.

Analytical technique

The budgetary analysis was used to estimate the net returns from the seedling production. The constituents of the budgetary equation are as follows;

Variable cost (VC) – The cost of inputs which vary with the level of output produced.

Fixed cost (FC) – this is the cost of inputs which remains constant irrespective of the quantity of output produced.

Annual depreciation (AD) – this is the provision made for the portion of fixed cost items consumed within the production year. The straight line depreciation method was used to estimate annual depreciation charges for the purpose of this study. Annual depreciation was computed as;

$$Annual\ depreciation(AD) = \frac{Purchase\ price\ of\ fixed\ item\ (PP) - Scrap\ value(SV)}{Useful\ life\ (UL)}$$

Where; PP is the purchase price of the fixed cost item, SV is scrap value which is the remaining value of the fixed cost items after its useful life, while UL is the length of life of the capital item used for production.

Total cost (TC) – this is the addition of the total variable and total fixed costs;

$$TC = TVC + TFC$$

Total revenue – this is the product of total quantity of output (Q) produce and the price per unit of output (P_Q);

$$TR = Q\ P_Q$$

Net return – this is the difference between the total revenue and the total cost;

NR = TR – TC

RESULTS AND DISCUSSION

The results in Tables 1, 2 and 3 show the variable cost, fixed cost, total cost and returns from raising 1000 stands of Jatropha. The variable cost profile indicates that the cost of labour occupy the highest proportion of variable cost followed by the cost of seed. Labour is used to maintain the nursery as well as water the seedlings. Intending entrepreneurs may reduce this cost by remunerating labour on monthly rather than daily basis. The total variable cost for the 2 months duration from raising the seedlings is ₦47,300.00. In the case of the fixed cost, the cost of nursery shed and river sand constitute the highest percentage. The total fixed cost for this period is ₦10,811.64 while the total cost for the same period is ₦58,111.64.

The seedlings achieved a 90 percent germination rate and 1000 stands of seedlings were nursed to maturity. The total returns from the seedlings at the rate of ₦100 is ₦100,000.00 while the net returns is ₦41,888.36.

CONCLUSION

The study showed that Jatropha seedling production is a promising enterprise. About 90% germination rate was achieved which is very encouraging. Variable cost was higher than the fixed cost with labour representing the most significant cost element. A stand of the seedling was produced at the rate of ₦58.11, while a gain of ₦41.88 was realized

per seedling. A large scale production of seedling is encouraged to further reduce the cost of labour. Also about 3 production cycles are encouraged to produce opportunity to maximally utilize the fixed cost component. Also, private concerns, government at different levels, non-governmental organization and employment creation agencies can promote development of the different value chain components of Jatropha so as to create ready market for Jatropha seedlings.

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Table 1: Variable cost for raising 1000 stands of Jatropha seedlings

Variable cost Item	Quantity	Price (₦)/unit	Cost (₦)	Percentage of total variable cost (%)
Jatropha seed	1 packs	6,500.00	6,500.00	24.16
Polythene bags	1200 pieces	400.00/pack of 100 pieces	4,800.00	8.92
Saw dust and organic fertilizer		5,000.00	5,000.00	9.30
Soil sieve	1	1,000.00	1,000.00	1.86
workmanship	2 months	500.00/day	30,000.00	55.76
Total			47,300.00	100

Source: Computed from study data, 2014

Note:

US$ = ₦160.37average exchange rate available at www.exchangerates.org.uk/USD-NGN-31_12_2013-exchange-rate-history.html accessed 3/05/2015

Table 2: Fixed cost for raising 1000 stands of Jatropha seedlings

Fixed cost item	Quantity	Price (₦)/unit	Cost	Depreciated cost (₦)	Percentage of total fixed cost (%)
Nursery shed (Locally constructed)	1	10,000.00	10,000.00	2,500.00	23.12
River sand	2 tipper load/10 tons	5,000.00	10,000.00	2,500.00	23.12
Watering can	2	1,200.00	2,400.00	800.00	7.40
Cutlass	1	700.00	700.00	333.33	3.08
Hoe	2	400.00	800.00	266.66	2.47
Shovel	1	850.00	850.00	283.33	2.62
Rake	1	800.00	800.00	266.66	2.47
Hand trowel	2	900.00	1,800.00	600.00	5.55
Head pan	2	1,300.00	1,300.00	886.66	8.20
Wheel barrow	1	9,500.00	9,500.00	2375.00	21.97
Total				**10,811.64**	**100**

Source: Computed from study data, 2014

Note:

i. US$ = N160.37average exchange rate available at www.exchangerates.org.uk/USD-NGN-31_12_2013-exchange-rate-history.html accessed 3/05/2015

ii. Nursery shed, river sand and wheel barrow were estimated to have a useful life of 4 years while other items a useful life of 3 years. All items are assumed to have no scrap value after these periods.

Table 3: Costs and returns from raising 1000 stands of Jatropha seedlings

Cost/Return	₦
Variable cost	47,300.00
Fixed cost	10,811.64
Total cost	58,111.64
Total return for 1000 seedlings @ ₦100.00/seedling	100,000.00
Net returns	41,888.36

Source: Computed from study data, 2014

Note:

i. US$ = N160.37average exchange rate available at www.exchangerates.org.uk/USD-NGN-31_12_2013-exchange-rate-history.html accessed 3/05/2015

ii. A 90 percent germination rate was achieved, hence 1000 stands of the seedlings were eventually raised from the 1,111 stands planted.