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RESEARCH ARTICLE

PROSPECTS AND CHALLENGES OF RICE SEED MULTIPLICATION SCHEME IN BENUE STATE, NIGERIA

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ABSTRACT

This study was conducted to assess and analyze the prospects and challenges involved in contractual rice seed multiplication programme for seed companies in Benue state, Nigeria. Specifically, the study examined the profitability and constraints of the seed farmers. Purposive and random sampling were used to select 68 rice outgrowers/ contract farmers. Data was collected on farm management systems, production information including cost and return figures and lastly constraints faced by the respondents. Gross margin analysis and the likert scale model were the tools used in achieving the objectives. The results showed that the farmers had a gross margin of ₦97866.47 per hectare. The net return on investment was 0.52. High cost of labour, unfavourable buy-back prices and delay in buy-back by seed companies were the biggest constraints faced by the rice seed contract farmers. It was recommended that efforts should be made to support smallholder rice farmers to access affordable handy technologies for their rice growing operations, and legislations should be made, aimed at protecting smallholder contract farmers especially from breach of buy-back process (time, price and logistics) from the contracting seed companies.

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INTRODUCTION

Majority of the poor in sub-Saharan Africa depend on agriculture for survival, and thus the agricultural sector is a key fundamental for spurring growth, overcoming poverty, and enhancing food security (Awotide *et al*, 2012). Nigerian farmers produced an array of staple food crops; however, rice (*Oryza sativa*) is the most important staple food. Rice production contributes significantly to employment generation, particularly in the producing area from cultivation down to marketing (Ogundele & Okoruwa 2006). Demand for rice has been increasing at a faster rate in Nigeria than in most part of Africa with about 24.5 kg per capital consumption per year (Daramola, 2005). A combination of various factors seem to have triggered the structural increase in rice consumption. Urbanization appears to be the most important cause of the shift in consumer preferences towards rice in Nigeria (Akande, 2001). The total annual domestic rice demand is estimated to be about 5 million metric tons, whereas the annual domestic output of rice still hovers around 3 million metric tons, leaving a gap of about 2 million metric tons (Tiamiyu 2010). The rice importation bill has recently risen to US$1.3 billion. Nigeria was ranked first in Africa and second in the world with importation of 1.6 million tons in 2006 (AfricaRice Center 2008). It is increasingly becoming burdensome for the economy of Nigeria to continue rice importation from Thailand, Vietnam, China and other net rice exporters in Asia. To remedy this, the government of Nigeria through Federal Ministry of Agriculture and Rural Development (FMARD) launched the Rice Transformation Agenda programin 2011 to achieve sufficiency in local production (FMARD, 2013). Nigerian government had a set target to achieve self-sufficiency in rice by 2015 and export by 2017. Notable among these efforts is the development and dissemination of improved rice seed varieties. The improved rice varieties enable farmers to crop several times within a planting period because of a relatively short growing period (high genetic potential of these seeds ensures bumper harvests), disease and pest resistance, and drought tolerance. The improved varieties can also compete favorably with weeds (Africa Rice Center 2008). Awotide *et al*. (2012) pointed out that the expectation was that if farmers had access to certified improved rice seed at the right time, then yield of rice would increase, which was also expected to increase farmers' income and ultimately reduce poverty among the farming households. Formal seed systems are presently poorly integrated with the local seed/grain channels. Formal systems are closely managed, from the

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development of varieties to multiplication and certification to marketing by commercial outlets to farmers (CIAT *et al.,* 2014). Contrary to what was obtainable when government was the only body involved in production and marketing of foundation and certified seeds, it is now the sole responsibility of private companies to produce foundations and certified seeds for farmers. BNARDA, (1994) and Erenstein *et al* (2003) reported that seeds and fertilizer have long been controlled by the government for political rather than economic reasons, squeezing out the private sector.

There are now over one hundred and fifty registered seed companies in Nigeria mandated by the National Agricultural seeds act to engage the services of smallholder farmers that carry out contractual outgrowing operations, for the purpose of rice seed multiplication (NASC, 1992). Shabu *et al.* (2011) opines that outgrower programme is designed to strengthen the capacity of small holder farmers to produce a sustainable supply of high quality rice, as it develops farmers' capacities to economically use appropriate production and post-harvest technologies to ensure improved productivity and a sustained volume of high quality rice at economically viable cost. Despite all the policies and programmes put in place to attain self-sufficiency in local paddy production by 2015 and exportation by 2017, there has been a huge production deficit as against the 2011 production projection blue print. As at 2014, rice importation was about 2.5 million metric tons. Access to certified improved rice seeds has not being properly facilitated for the benefit of rice farmer. Awotide *et al.* (2012), stated that access to certified, improved rice seed has a lot of implications for rice production and agricultural development in Nigeria. This possibly could be traceable to a couple of factors and chiefly among them is the performance of farmers contracted by seeds companies to multiply high yielding rice seed varieties. Figure 1 below explains the role of the contract farmers.

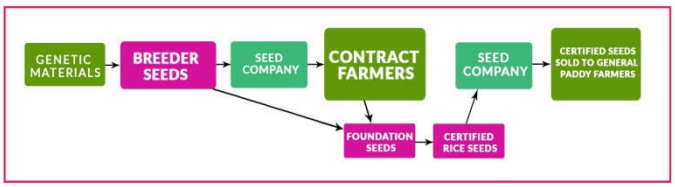

Figure 1. Rice Seed Multiplication by Contract Farmers

The main objective of the study was to examine the prospects and challenges of contractual rice seed multiplication scheme in Benue state of Nigeria.

The specific objectives were to:

i. Determine the profitability of rice production under the seed multiplication program;
ii. Identify the constraints faced by the rice seed multiplication contract farmers.

Methodology

Study Area

The study was conducted in Benue State, Nigeria. Benue State lies between Latitudes 6°30' N and 8°10' N and Longitudes 6°35 E and 10° E. The climate of the State is tropical, with two clear but differentiated wet and dry seasons. The annual rainfall ranges from 508 mm to 1006 mm, while the annual temperature ranges from 21°C to 35°C. Geographically, the State lies within the southern Guinea savannah agro-ecological zone of Nigeria and has an estimated population of 4.22 million [National Population Commission (NPC), 2006]. About 75 percent of the population engage in rain-fed subsistence agriculture. Popularly known as the "Food Basket" of the Nation, the State produces such crops as rice, sorghum, millet, yams, cassava, cocoyam, sweet potato, pigeon pea, beniseed, soybeans and groundnuts as well as tree crops like citrus, mango, oil palm, guava, cashew, cocoa and *Avengiaspp* (BNARDA, 2005).

Population and Sampling Procedure

The population of the study was rice farmers in Benue State. Purposive sampling was used to select companies producing rice seeds in Benue State. Lists of 225 rice seed outgrowers were obtained from seeds companies. A random selection of 68 (sixty eight) farmers actively involved in rice seed production in contractual partnership with 7 seed companies across 4 local governments (Makurdi, Ushongo, Oju and Guma) in the three geopolitical zones was made.

Data Collection

Primary data were collected using structured questionnaires, administered to the rice seed outgrowers and non-outgrowers with the aid of enumerators. Information obtained include; socio-economic characteristics of the farmers, farm management systems, inputs costs, quantity of outputs and returns, and constraints faced by the rice farmers. Secondary data sources include journals, National Agricultural Seeds Council annual reports, and government reports.

Data Analysis

The gross margin (GM) analysis was used to determine the profitability of rice seed production. The total variable cost and total revenue were estimated.The gross margin analysis was used with assumption that fixed costs in small-scale farming are negligible (Olukosi and Erhabor, 1988; Omoteshae*t al*, 2010 and Abdullah, 2012). It is expressed as:

GM = TR – TVC

Where:

GM = Gross margin (₦/ha)
TR = Total Revenue (₦/ha)
TVC = Total variable Cost (₦/ha)

To examine the challenges of the program, respondents were asked to indicate levels on a pre-determined 5-points constraints scale.

RESULTS AND DISCUSSION

Profitability of Rice Production under Seed Multiplication Scheme

Tables 1 and 2 show the gross margin analysis of rice seed production by outgrowers and non-outgrowers respectively. The study revealed that labour alone accounted for 59.93% of the total variable cost for rice seed outgrowers, while about

64.75% for non-outgrowers. This shows that rice seed production in the study area was highly labour intensive. The high labour cost in the study area is, therefore, attributable to low level of mechanization and scarcity of labourers. This result agrees with the findings of Nwike and Ugwumba (2015), in their study on Profitability of Rice Production in Aguata Agricultural Zone of Anambra State Nigeria. They discovered labour accounted for about 75.80% of the total cost of rice production in the study area. In addition, Omotesho *et al*. (2010) who in their study of rice production in Kwara State reported that labour accounted for 73.78% of total cost. It was however far higher than the 19.72% human labour cost reported by Nirmala and Muthuram (2009) in Kaithal District of Haryana India, where machine labour constituted the major variable cost of rice production. Other cost items included seed with average cost per hectare of₦21,500 (11.4%) for outgrowers and ₦11,811.90 (7.54%) for non-outgrowers. This reveals that rice seed contract farmers (outgrowers) spent double the amount non-outgrowers spent on seed. This means that good quality improved seeds cost more than recycled grains sold as seeds at open markets. Fertilizer had average cost per hectare of ₦29500.00 (15.64%) for outgrowers and ₦24496.82 (15.94%) for non-outgrowers. This indicates a close margin on percentage of total variable cost that went to fertilizer by the two categories of farmers.Outgrowers spent ₦21594.12 (11.45%) on herbicides while non-outgrowers spent ₦16268.25 (10.66%). The above results were also found to be similar to 6.81% for seed, 10.66% for fertilizers and 3.13% for agrochemicals reported by Ohaka *et al*. (2013).

Table 1. Gross Margin Analysis for Outgrowers

Variables (N Value)	Amount (₦)/ Hectare	% of Total Variable Cost
Seed	21500.00	11.40
Pesticides	2970.00	1.57
Herbicides	21594.12	11.45
Fertilizers	29500.00	15.64
Labour	113012.38	59.93
Total Variable cost (TVC)	188576.50	100
Total Revenue (TR)	286442.94	
Gross Margin [GM = TR-TVC]	97866.47	
Gross margin per naira invested [NROI = GM/TVC]	0.52	

Source: Field survey 2015

Table 2. Gross Margin Analysis for Non-outgrowers

Items	Amount (₦)/ Hectare	% of Total Variable Cost
Seed	11811.90	7.54
Pesticides	1704.83	1.11
Herbicides	16268.25	10.66
Fertilizers	24496.82	15.94
Labour	99371.85	64.75
Total Variable cost (TVC)	153653.65	100
Total Revenue (TR)	207370.97	
Gross Margin [GM = TR-TVC]	53717.32	
Gross margin per naira invested [NROI = GM/TVC]	0.35	

Source: Field survey 2015

The gross margin per hectare for outgrowers was ₦97866.47, while that for general paddy farmers was ₦53717.32. This indicates that profit made by seed outgrowers almost doubled that of the non-outgrowers. This could be directly attributed to the larger quality of seeds, volume of herbicides and quantity of fertilizer used by the rice seed outgrowers and possibly some other efficiency factors that boosted productivity. The gross margin per naira invested [Net Return on Investment (NROI)] in rice seed production was 0.52, while that of paddy was 0.35. This is similar to the findings of Nwike and Ugwumba (2015) who found a NROI for paddy farmers in their study area to be 0.37.

Constraints to Rice Production

Table 3shows the different constraints faced by the rice seed outgrowers (beneficiaries) as indicated by the respondents. High cost of labour was the most disturbing constraints (4.61) for the farmers. Labour costs are associated with money paid for human efforts to carry out production activities such as land preparation, tillage, weeding, planting, fertilizer and pesticides application, water channeling, harvesting, threshing & bagging, transportation and storage. Thenext constraint was unfavourable buy-back prices (4.48). Majority of the farmers complained about the poor uncompetitive prices the seed companies offer for their seeds. Many of them affirmed that the seed companies sometimes buy less than the amount paddy is sold per kg in the open market. Another constraint was delay in buy-back by seed companies (4.29). Sometimes it took seed companies more than 8 months to buy-back the multiplied seeds from the farmers. It is of importance to note that farmers are always in need of money to cater for personal and family needs. They get discouraged when they have their rice harvested and stored, and the pre-agreed buyers (seed companies) are not forth coming.Other constraints include limited access to credit facilities (4.22), poor infrastructural (roads) (4.05), insect and disease attack (3.01), land tenure systems (3.94), high cost of fertilizer and agro-chemicals (3.87), poor storage facilities (3.65),poor marketing system (3.62), and lack of improved seeds (3.56). The least constraint faced by the beneficiaries was lack of Certification Officers' visit (3.51).

Table 3. Constraints to Rice Production Faced By Beneficiaries (Seed-Producers)

Constraints	Calculated Mean	Rank
High cost of labour	4.61	1
Unfavourable buy-back prices	4.48	2
Delay in buy-back by seed company	4.29	3
Limited access to credit	4.22	4
Poor Infrastructure	4.05	5
Insect and Disease attack	3.01	6
Land Tenure system	3.94	7
High cost of fertilizer and agrochemical	3.87	8
Poor Storage Facilities	3.65	9
Poor marketing system	3.62	10
Lack of improved seed	3.56	11
Lack of Certification Officers' visit	3.51	12

Source: Field survey 2015

From Table 3, it can be inferred that the biggest constraints faced by the rice seed farmers was high cost of money spent on labour for production. Reasons for this are not far-fetched. Majority of the rice farmers in the study area were smallholders who cultivate less than 5 hectares, and solely rely on manual as source of labour. Majority could not afford to buy handy technologies such as hand-drawn tractor, semi-mechanized boom sprayer that help reduce man-hours. In addition, most of the rice farmers harvest around the same time of the year, leading to high labour demand than supply. This consequently leads to labour shortages and high cost for those

willing to pay. Labour is an integral part of farm production and accounts for 70% of total production costs (Nweke, 1980). Shaib *et al.* (1997) documented that over 90% of all task in the non-mechanized production system depends on human labour, while for mechanized production system, between 50-60% of the task depends on human labour. Nwike and Ugwumba (2015), Muhammed-lawal (2013), Ugwu (2013), and Usman (2010) in their studies on constraints to rice production found out that farmers' responses ranked labour costs highest. There are, however, few exceptions, such as the study Ohen and Ajah (2015) carried out on cost and return analysis in small scale rice production in Cross River State, Nigeria. They found out that lack of production support credit was rice farmers' biggest constraints.

Conclusion and Recommendations

Rice seed multiplication is a highly profitable venture owing to the fact that gross margin stood at ₦97866.47 per hectare, and net return on investment (NROI) was 0.52. This is more than what most other rice farmers obtain. This could directly be attributable to support incentives given to the farmers by the contracting seed companies such as subsidized high yielding improved seeds, fertilizers and herbicides. The farmers also received constant visit and technical support from trained rice field officers of the seed companies. To cap it up, the effect of certification activities carried out by government certification officers in order to ensure standard agronomic practices are followed, genetic purity is maintained and objectionable rice weeds are rogued off can also be a huge contributing factor to this feat. Conversely, high labour cost posed the greatest challenge to the farmers. This was closely followed by unfavourable buy-back prices and delay in buy back of the seeds by the contracting companies. Concerted efforts should be made to support smallholder rice farmers to access affordable handy technologies for their rice growing operations. As it is believed, technology helps save time, labour costs and equally ensuring stress free production activities. In addition, interventions and legislations should be made, aimed at protecting smallholder contract farmers especially from breach of buy-back process (time, price and logistics) from the contracting seed companies.

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