ENHANCING PRODUCTIVITY, INCOME AND MARKET ACCESS OF RURAL PRODUCERS IN AFRICA: THE CASE OF CONTRACT FARMING IN NIGERIA

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1. INTRODUCTION

The development of agriculture is pivotal to the transformation of most African economies and African peoples' livelihoods. About 70 percent of Africans and nearly 80 percent of the continent's poor live in rural areas and depend mainly on agriculture for their livelihood. The sector accounts for about 20 percent of Africa's GDP (UNECA, 2004), 60 percent of its labour force and 20 percent of the total merchandise exports (AU-NEPAD, 2003). Agriculture is the main source of income for 90 percent of rural population in Africa (UNECA, 2005). Increased agricultural production is necessary to tackle starvation and malnutrition, and rapid growth in agricultural production and productivity is a precondition for economic take-off and sustained poverty reduction in Africa. Agricultural productivity levels in Africa, in terms of both land and labour productivity, still lag far behind other developing regions. Total Factor Productivity grew at an annual rate of 1.3 percent on average during the 1990s, accounting for approximately 40 percent of the 3.1 percent annual growth in agricultural output. Growth in the traditional inputs of land, labour, and livestock accounted for the other 60 percent of agricultural output growth. The average annual growth in cereal yield in 1980-2000 has been low in SSA (0.7 percent) compared to Asia (2.3 percent), Latin America (1.9 percent) and the Middle East and North Africa (1.2 percent) (AU-NEPAD, 2006). On the basis of value added per worker, which is another measure of productivity that is crucial for increased competitiveness of African agriculture in the global market, Africa's performance is also low compared to other regions of the world. Africa's value added per worker has been the world's lowest. By 2004, world agricultural productivity (US$919) averaged three times that of Sub-Saharan Africa (US$344) while in Latin America agriculture is nearly 10 times more productive at US$3,183. Such low levels of productivity constitute an impediment to poverty reduction in Africa. However, within Africa, there are large variations between different countries' average levels of productivity. Countries such as Tanzania, Mozambique, the Congo Republic, Guinea, Mali, Burkina Faso, Central African Republic, and Rwanda have shown sustained growth over the past years. Others, such as Burundi, the Democratic Republic of the Congo, Madagascar, Mauritania, Swaziland, Lesotho, Senegal, Seychelles, and Zimbabwe, have suffered significant decreases in agricultural productivity (see Ajakaiye and Olomola 2009).

In Nigeria, available data indicate that the contribution of agriculture to total GDP in the country averaged 35 percent between 2000 and 2005. The sector is also making significant contribution in providing employment for over 60 percent of the population and in ensuring food security in general. However, as growth in the agricultural sector and economic growth in general is on the increase, the actual population in poverty is also growing. This paradox raises the critical question as to whether or not growth in Nigeria is actually pro-poor. Moreover, agricultural GDP in recent times has been growing at a decreasing rate from 7.40 percent in 2006 to 6.54 percent in 2008. Thus, in achieving the broad goals of economic growth and poverty reduction in the country it is imperative to ensure that growth is pro-poor and sustainable in general and in the agricultural sector in particular. The overarching issue now is how to design effective mechanisms and institutional arrangements to increase productivity and sustain the growth of agriculture.

Besides, in spite of the widespread economic reforms embarked upon by the government for the past ten years and crave for the emergence of a free market economy in Nigeria, the market is still fraught with grave imperfections. Thus, the operations of the market cannot reflect the dictates and assumptions of the neoclassical economic paradigm. According to the New Institutional Economics, when market failures occur, either a surrogate institution emerges to allow the transaction to take place or the transaction simply does not occur at all (de Janvry *et al.*, 1991). By definition, institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction; in consequence they structure incentives in human exchange, whether political, social, or economic (North, 1990). In the agricultural sector of developing countries, institutions evolve to deal with all kinds of market failures in an environment of pervasive risks, incomplete markets and information asymmetries (Key and Runsten, 1999). They often perform the functions of several imperfect markets, parallel to the spot market. These alternative agrarian institutions can take the form of a cooperative, peasant association, marketing boards, insurance and credit groups, internal transactions within the household, as well as all types of contracts with interlinked transactions (Bardhan, 1980; Ellis, 1988; Olomola, 1996).

Contract farming (CF) is a major agrarian institution that has been widely applied in developed and developing countries at different times for improved coordination and performance of the agricultural market and for addressing different types of market failures in general. CF has been found to be capable of removing market imperfections in produce, credit, land, labour, information and insurance markets. It has also helped in facilitating better coordination of local production activities which often involve initial investment in processing, extension and so forth and in reducing transaction costs (Grosh, 1994; Key and Runsten, 1999; IFPRI, 2005). It has also been used in many situations as a policy measure by the state to bring about crop diversification for improving farm incomes and employment (Benziger 1996; Singh, 2000). From the standpoint of the New Institutional Economics, CF can create positive externalities like employment, market development or infrastructure, if agribusiness firms can provide them better than the open market or the state (Key and Runsten, 1999).

The Nigerian economy is becoming increasingly market-oriented and private-sector led. The unfolding scenario is such that small-scale farmers face considerable market constraints including poor market information, restricted access to credit and modern inputs and high transaction costs arising from weak market integration. Consequently, the farmers are finding it increasingly difficult to compete and are becoming more vulnerable to economic exclusion and poverty. It is not surprising therefore, that the agribusiness sector is currently being encouraged to engage in contract farming and producers of food and non-food crops are responding to this institutional approach in many parts of the country.

As an institutional mechanism, contract farming requires a continuous adjustment process, according to the characteristics of the agents and the exogenous conditions they are facing. Thus, a better understanding of the interactions between the contracting parties and the driving forces in the relationship will enable us to understand the causes and effects of contract engagement and the options for improving its performance especially in terms of increased agricultural productivity and profitability. In this connection this study will unravel the following key research questions. What are the motivations for contract farming? In other words why is contract farming a necessary institutional mechanism for transforming Nigerian agriculture? How has it contributed to improvement in productivity, profitability and access to resources and markets among smallholders? What is the impact on farmers' income and implications for pro-poor growth? Has the governance structure been successful? If so what are the reasons for success? What are the constraining factors and how can they be tackled for

improved performance? Specifically, the objectives of the study are to (a) examine the nature of institutional innovations in the contract farming arrangements including the design and enforcement of contracts and governance of the relationships, (b) analyse the impact of the institutional linkages with a view to ascertaining whether or not they are supportive of pro-poor growth especially in terms of increased productivity and farm income, access to production credit and access to market and (c) determine factors influencing the performance of the contractual relationships with a view to proffering suggestions for improvement.

2. METHODOLOGY

The study covers all forms of contract farming arrangements between small-scale farmers and agribusiness firms. Producers of food crops such as rice and soybean and non-food crop (tobacco) are included in the study. The firms and corresponding crops included in the study are shown in Table 1.1.

Table 1.1: Crops and Agribusiness Firms Included in the Study

	CROP	AGRIBUSINESS FIRM	LOCATION	ZONE
1	RICE	OLAM	Makurdi, Benue State	Northcentral
2	SOYBEAN	NESTLE	Lagos, Lagos State	Southwest
3	TOBACCO	BATIAL	Isheyin, Oyo State	Southwest

The choice of the crops is based on preliminary investigation which shows the existence of contract engagements by agribusiness firms to ensure regular supply of raw materials. The crops are also being actively promoted as export crops and this underscores their relevance in terms of increased employment and income potentials. Agrarian institutions such as different models of contract farming are likely to bring considerable improvement in the performance of the value chains of individual commodities and this is likely to enhance pro-poor growth and poverty reduction in the country.

2.1 Types and Sources of Data

Essentially, primary data are used in executing the study. Attention is focused on the contractual relationships between farmers and the relevant agribusiness firms as well as the production systems of the contract farmers and the non-contract farmers. The production-related data are obtained through the use of structured questionnaires. The data collected include quantity and cost of farm inputs such as seeds, fertilizer, herbicides and pesticides, hired labour, amount of credit obtained, utilized and repaid, area of land under cultivation, fixed capital and quantity and prices of output all relating to the 2007/2008 production season. With regard to the contractual relationships, the required data are obtained through focus group discussions (FGD) and in-depth interviews. Relevant officials in each of the agribusiness firms (Olam, BATIAL and Nestle) were interviewed while FGDs were held with producers of each of the selected crops involved in contract farming. Using appropriate interview and discussion guides information about various aspects of the contractual relations including the motivation, operational procedures, governance, benefits, strengths, weaknesses, constraints, sources and methods of dispute resolution and success factors were obtained. The analysis of the effects of the institutional linkages involves comparison of the production systems of contract and non-contract farmers. Thus, a sample of these categories of farmers cultivating each of the target crops was drawn. In each category, 50 producers were randomly selected giving a total of 300 producers included in the study. We employ qualitative and econometric techniques to analyse the data and to achieve the objectives of the study. The econometric analysis seeks to examine the differences in the productivity and

profitability performance of contract and non-contract farmers and the determinants of participation in contract farming as well as the impact of participation on income. A probit model is estimated to determine the key characteristics that influence participation in contract farming. The impact of participation in contract farming on per capita income is examined using a treatment effects model in respect of rice, soybean and tobacco in which the Heckman selection-correction model is used to correct for selection bias. In the analysis, the maximum likelihood estimation technique is adopted in which case all parameters are estimated simultaneously rather than the conventional Heckman two-step procedure.

3. RESULTS

3.1 Models of Contract Farming and Governance Structure
Different models can be adopted in the implementation of CF schemes. Five broad models of CF have been defined in the literature (Eaton and Shepherd, 2001) depending on the product, the resources of the sponsor and the intensity of the relationship between the farmer and the sponsor. They are centralized model, the nucleus estate model, multipartite model, informal model and the intermediary model. The centralized and multipartite models apply to the three crops covered in this study. The basic characteristics are summarized in Table 3.1.

Table3.1: Characteristics of Contract Farming Models in Respect of the Selected Crops

COMMODITY	MODEL	SPONSOR	CHARACTERISTICS
Rice	-Centralized -Multipartite	OLAM	-Centralized rice miller buying rice from farmers -Farmers registered as cooperative group members -Operate through appointed group coordinators -Involvement of Nigerian Agricultural Insurance Corporation (NAIC)
Soybean	-Centralized -Multipartite	NESTLE	-Centralized processor buying soybean from farmers -Link with farmers through government agency (OYSADEP) which is also playing a facilitating role
Tobacco	-Centralized	BATIAL	-Centralized processor buying tobacco from registered farmers -Quota allocation and very tight quality control

Source: Author's compilation

3.1.1 The Rice CF Model
The development of the rice industry through public private partnership (PPP) is being supported by Olam Nigeria Limited through contract farming (CF) programmes in three states in the north-central part of the country; specifically in Benue, Kwara and Niger states. The objectives of the CF programmes are to (i) support the development of farmer groups through the mobilization of farmers and facilitation of group formation, (ii) develop the capacity of farmers for increased production and improved productivity through training in rice production management practices, post-harvest handling, maintenance of high quality standard and improved marketing strategies, (iii) improved the marketability of farmers' produce through quality improvement, increased output and improved storage facilities, (iv) establish viable strategic partnerships that include farmers, government agencies and Olam to ensure good flow of information, knowledge and technological innovations, (v) facilitate farmers' access to modern inputs such as improved seed varieties, fertilizers and agro-chemicals and (vi) increase profitability of rice cultivation by providing assured markets and profitability-enhancing technologies.

Olam refers to the CF model in Benue state as the Total Support Model (TSM). This involves three main components. First, is the supply of all inputs by Olam to the participating

farmers as in-kind credit. The inputs are certified seeds, herbicides, crop protection chemicals, fertilizers and sprayers. Second, is the capacity building component which is a form of extension services involving (i) training of trainers for lead farmers – 5% of total population, (ii) field demonstration days in various model farms during which all contract farmers are invited to take part twice in a year and (iii) exposure of contract farmers to site-specific package of practices. Third, is the buyback of produce involving the provision by Olam of incentives such as (i) provision of uniform bags to farmers for rice packaging, (ii) provision of tractors to lift the produce from the farm gate, (iii) absorption by Olam of incidental costs of loading and off loading, (iv) provision of financial rewards to group leaders on a per-metric-tonne basis and (v) procurement of rice on prevailing market price decided by a 10 member committee.

The paddy rice procured by Olam from the farmers are milled and packaged for sale in the domestic market. There is hope that as time goes on such rice will also be exported. In the TSM, USAID MARKETS also performs key functions such as capacity building programmes through training of trainers (TOT) and organization of field days, facilitation of farmers' group formation and management of the model farms in terms of sending technicians to monitor day-to-day operations on the farms. The role of the Benue state government is the facilitation of the supply of fertilizers.

3.1.2 The Soybean CF Model

Soybean CF in Nigeria involves centralized and multipartite models. Companies that process soybean and market the products (Nestle Nigeria Plc and Slabmark Nigeria Ltd) link up with farmers for the production of the required soybean. The multipartite nature of the contract manifests in the way the firms secure the linkage with farmers and in the roles performed by intermediaries in the implementation of the contract. The linkage between Nestle and the soybean farmers is through the Oyo State Agricultural Development Programme (OYSADEP) and the University of Agriculture, Abeokuta (UNAAB). The OYSADEP also serves as an intermediary in the linkage between Slabmark and the farmers. Whereas the Nestle CF model can be described as a market specification contract, the Slabmark model is a resource-providing contract. The Nestle model started in 2004 whereas the involvement of Slabmark in contract farming in the Southwest is a much more recent phenomenon taking full effect during the 2008 production season.

3.1.3 The Tobacco CF Model

The tobacco contract farming model is basically a centralized type. The British American Tobacco Iseyin Agronomy Ltd (BATIAL) is a subsidiary of the British American Tobacco (BAT) Nigeria Ltd which deals with the processing of tobacco in Nigeria. BATIAL is involved with the implementation of the tobacco CF programme in South-west Nigeria. Basically, under the tobacco CF arrangement, farmers are registered and contracted to produce tobacco and sell only to BATIAL. The company started operations in September 2003 as a subsidiary of BAT Nigeria Ltd which was incorporated in July 11th, 2000 and subsequently merged with the Nigerian Tobacco Company (NTC) plc in November of the same year. BATIAL is a company using tobacco leaf as raw material. There are no independent tobacco producers in Nigeria, so the company caused tobacco to be produced. BATIAL is involved in contract farming to ensure sustainable supply of raw material and contribute towards agricultural development in its area of operation.

3.2 Governance of the Contractual Relationships

3.2.1 Governance of the Rice Contract Farming

Design of Rice Contracts
Basically Olam is a trading company in agricultural commodities all over the world. Its engagement in rice CF is a kind of backward integration to ensure a regular source of raw material for its rice mill and to enhance farmers' productivity and profitability. It is also embarked upon as part of the company's corporate social responsibility. The contracting procedure is by registering interested farmers. Registration of farmers is on an annual basis. Farmers are registered as groups – cooperative societies. As at 2007, Olam operated with 72 cooperative groups with group members ranging from 30 to 120. Usually, Olam appoints a coordinator to manage the groups and there can be between 13 to 20 groups under each coordinator. The coordinator signs contract agreement on behalf of Olam while group leaders sign on behalf of the members. The coordinator reports directly to the project manager. The contract hinges specifically on input supply and buy-back of paddy. In Benue State, Olam operates in 7 LGAs namely, Guma, Makurdi, Gwer West, Gwer, Otukpo, Tarka and Gboko.

Rice Pricing Mechanism
There is a price committee consisting of group leaders and coordinators. They move around markets in Benue State and outside and analyse the market prices and unanimously take a decision as to what should be the price of the paddy for that period. Their decision is presented before Olam management for approval. Olam management compares feedback from price networks within the country with the price placed before it and approves accordingly. The management consists of the General Manager, the Product Head in charge of rice (who is in the Lagos Office) and the Project Manager. There can be variations in the prices received by farmers based on the quality of paddy. The degree of admixture (of long grain and short grain e.g FARO 44 and TON 2) is the quality criterion which is often applied to differentiate prices. Variation in moisture content does not affect pricing. Further drying of paddy can be carried out at the factory if need be. Invariably, effective monitoring of groups through the group leaders and buy-back of the produce at the prevailing market price are key instruments being employed to ensure that rice farmers will not sell in other markets but bring the produce to Olam. Other incentives include the following.

Establishment of Model Farms. To produce good quality seeds for distribution to the farmers and to serve as demonstration plots during field days for the training of farmers. This includes the green stage training otherwise known as the in-season training and the brown stage training during which farmers are taught Good Agricultural Practices. At the green stage, cultivation practices such as land preparation, planting, weeding and plant protection measures are taught. At the brown stage attention is focused on pre-and post harvest practices, bird scaring and proper harvesting methods. There is training of trainers workshop (TOT) for the group leaders who are to embark on training of farmers in addition to the Field Days organized for the farmers.

Provision of Buy-Back Incentives. Olam provides bags and tractors for transportation and some money for bagging, stitching and security. The group leaders report to coordinators, collect tractor and go to the villages to convey the produce and bring to Olam's rice mill in Makurdi. Thereafter the paddy goes for milling. They are finally packaged into 5kg, 10kg, 25kg and 50kg bags. Olam provides the following incentives.
- 10 empty bags per MT at no cost
- 650/MT towards loading and delivery expenses
- bear the cost of transportation of the paddy from farmers' villages to the mill –about 4000/MT

- Olam ensures that payment is made in full within 24 hours of receipt of paddy at the mill. If the bags weigh more than 100 kg (which is the standard package for paddy), there is additional proportional payment for the excess quantity.

Provision of Insurance Facilities. Olam ensures that the out-growers farms were insured with NAIC in 2007. The premium paid is 3% of total cost of cultivation for the 6000 ha. Cost of production was estimated at   55,000 per ha. The crop cycle is from May to December but the actual gestation period is from 90 to 120 days for the FARO 44 and 52 varieties. In the case of any damage during the production year, compensation is limited to the proportional cost incurred up to that particular stage in the production process. There were reports of flood damage from 140 rice farmers in 2007. A sum of   4.7 million has been claimed by Olam as compensation from NAIC. This will be paid to the affected farmers after the buy-back exercise is over around May 2008. If farmers default in their loan repayment the claim amount due to the farmers concerned can be used to partly offset the loans.

3.2.2 Governance of the Soybean Contract Farming
Design of Soybean Contracts
During the period of ONADEP, soybean was introduced to Oyo North by IAR&T. Farmers cultivated the crop on small-scale basis in the form of on-farm trials. Following its adoption, some farmers started planting the crops on their farms. However, there was not enough market to absorb the production. Under the Women in Agriculture (WIA) programme of the ADP, efforts were made to popularize the consumption and use of soybean for soya-cheese, soy-ogi, soya-milk and so on. Invariably production was in excess of demand and the need arose to seek out marketing opportunities outside the ONADEP area. The ONADEP seed manager therefore, visited Nestle in 1998/99 to establish marketing contact so that the company can buy excess soybean from the farmers. Nestle gave the varieties they wanted as well as quality specifications of grains desired in terms of size, milk content etc. The first purchase by the company was in 2000. The extension agents who have information about the farmers who grow soybean on a continuous basis and who have demonstrated good performance, were involved in the identification and selection of farmers for participation in the supply of soybean. In 2007, there was no sale to Nestle because many of the farmers sold their product as seeds which commanded higher prices than grains which the company required. There was competition for soybean for livestock feed and human consumption. In 2008, Nestle offered   74,000 per tonne but the farmers were supposed to receive   64,000. But there are other buyers who are ready to pay the farmers more than this price so, the farmers may not be interested in selling to Nestle. Besides, for other buyers, the arrangement is more or less on "cash and carry" basis whereas in the case of Nestle, payment often takes quite some time.

Soybean Pricing Mechanism and negotiation process
The marketing manager of Nestle met with the Director of Technical Services and the Seed Manager of the Oyo State Agricultural Development Programme (OYSADEP) for negotiation and agreement on price. The price was reviewed yearly depending on the demand by Nestle, quantity required from the OYSADEP farmers and ability of the farmers to supply. The OYSADEP offered prices based on cost of production and transportation. For instance in 2006, the asking price was   70,000 per tonne while after negotiation the agreed price was   65,000 per tonne. After the agreement on price Nestle would issue an LPO.

The Role of Intermediaries in Soybean CF

In general, since 2000 the OYSADEP has been serving as intermediary and has not disappointed Nestle. However, as from 2004, UNAAB came into the picture and started to operate as an intermediary between Nestle and the farmers. The entry of UNAAB is supposed to create a better image for the OYSADEP and to ensure that farmers remain in production so that they can supply Nestle on a continuous basis. However, the farmers have confidence in OYSADEP which is greatly trusted in all parts of the state. The functions of OYSADEP in the marketing arrangement are as follows.

- Allocation of land for soybean cultivation to farmers
- Monitoring of farmers production from planting to harvesting
- Provision of shelling services which farmers pay for
- Provision of cleaning, sieving and physical quality improving services (removal of stones and dirts)
- handling of bagging and weighing (usually in 50 kg bags)
- payment of individual farmers by issuing cheques
- Collection of farmers produce from zones to OYSADEP Headquarters preparatory to supply to Nestle
- Supply direct to Nestle in Ota Warehouse from OYSADEP Silo in Shaki

3.2.3 Governance of the Tobacco Contract Farming

Design of Tobacco Contracts

The contracting procedure is by registering interested farmers. Registration of farmers is on an annual basis. The criteria for registration are physical presence in the farming village (no absentee farmer), ownership of land and farming experience. For the identification and selection of farmers, visits are usually made to the villages for registration of farmers; and existing farmers also circulate information within their communities. BATIAL recruits willing farmers of the right attitudes and who have access to land in the areas where the company wants to operate. It enters into agreement in respect of area of land to be cultivated, financial support, loan repayment, marketing of produce and payment of proceeds from sales. Usually, agreement is for one growing season but this is renewable. About 80 percent of the farmers who started the contract scheme continue to renew their participation. Some farmers started originally with the defunct Nigerian Tobacco Company (NTC) about 20 years ago. But resumed with British American Tobacco (BAT) in 2000 when the firm came round.

The land area to cultivate depends on each farmer's ability and this determines the level of support. BATIAL has extension agents who reside in farmers locations and monitor their activities to ensure good result at the end. Operations fall within 8 Local Government Areas (LGAs) in Oyo North in about 23 main villages. Loans given to farmers are in both cash and kind. But no interest is charged whatsoever. The in-kind loans are in form of fertilizer, flue pipes, iron sheets for barn construction and agrochemicals (insecticides such as KARATE and pre-emergence herbicides which serve as growth regulator). The contract agreement contains the company's commitment especially the quantity of output of farmers that must be purchased. If excess is declared by any farmer, the company is ready to absorb it. Such excess has never been refused whenever it occurs. And when farmers cannot meet their target, no penalty has ever been imposed, because it is characteristic of agricultural production and this is usually understood. The contract agreement is prepared by the Legal Department of BAT. In a year, cases of breach are less than one percent and this may be due to death or sickness.

A ledger is opened for each farmer for proper record keeping at the company level. All the loans given out are debited into the farmers' accounts. When they start bringing

tobacco for sale to the company the amount paid is credited into their account. Once the loan is offset, further sales belong to the farmer. Statements of accounts are printed and sent to the farmers on quarterly basis.

Tobacco Pricing Mechanism and Negotiation Process
The price at which BATIAL will purchase farmers' output is usually a subject of discussion and negotiation based on trend in the tobacco industry. The previous year's price, the prices of materials (inputs) to be supplied by BATIAL are also considered. The global tobacco price situation and its implications for local operations are also examined. The agreed prices are printed and distributed to farmers after the discussions and before the commencement of farming operations. Note that the materials supplied by the company to the farmers are at cost (BATIAL makes no profit from such supply). The farmers produce tobacco, cure it and present to BATIAL for sale. Purchase is made based on agreed grades and prices. There is no price variation after agreement is signed. The farmer is guaranteed a reasonable level of return on his investment.

The farmers were allowed to actively participate in the negotiations leading to an agreement of a particular price for their product at the end of the production season. For this purpose, the farmers organized themselves into the Nigerian Independent Tobacco Growers Association (NITGA). Key officers of this association opened discussions with BATIAL. Later representatives of growers in each village go to BATIAL in Isheyin to discuss. According to a top official of BATIAL in Isheyin, "Sometimes, negotiations can stall operations. But now farmers are becoming more understanding. There is competition from imports. Unending price increase is therefore, not the answer to increased profitability; rather the answer lies in increased productivity". To engender high credit recovery rate and sustained farmers' interest in the programme BATIAL introduced the following measures to serve as incentives.

Commission on total sales, baling bonus and incentive for early operations
The average price paid to farmers consists of 10 percent commission on total sales, baling bonus and incentive bonus for early commencement of operation. The incentive ranges from 1.5 per kg to 3.0/kg. For the first month of operation and bringing products forward for sale, the bonus is 3.0 kg this declines to 1.5/kg as the buying season progresses. These four components of the average price were being computed for individual farmers in the past. In 2007, however, it was decided that the components should be collapsed and the average price paid to each farmer without any distinction on the basis of each of the components. This is because the process was found to be too laborious, time consuming and expensive. This collapse does not change the average price agreed with the farmer; but this is what is being erroneously interpreted as the cessation of the incentive policy. Indeed, not all the farmers are entitled to the incentive bonus. Only those who enter the market early enough will benefit. Encouraging them to enter the market early enough also implies they have to be very timely at every stage of the production cycle; and timeliness also implies increased productivity. The productivity gain is even far more rewarding to each farmer than the incentive bonus.

Zero interest rate on loans.
BATIAL does not charge interest rate for the credit extended to the contract farmers (both cash and in-kind credit). Loan repayment comes from the tobacco proceeds and whatever is left is paid to the farmers through their bank accounts.

Productivity Award
Annually between 2004 and 2006, BATIAL organized farmers' productivity award ceremony during which three best farmers were rewarded in each of the five tobacco growing areas

while the star price was awarded to the overall best farmer. The criteria for the selection of award winners are total production, yield and average price (which is an indicator of quality) and number of trees planted by the farmer.

Support for sustainable tobacco production
In the 1990s BATIAL established wood lots to ensure sustainable tobacco production and renewability of the natural environment in which tobacco production takes place. Specifically, in 1990 a tree plantation of 710 ha was established along Isheyin Okeho road, while in 1992 another plantation of about 450 ha was established along Shaki-Ogboro road. The plantations consist of gmelina and eucalyptus species. Moreover, each farmer is expected to plant a minimum of 100 trees for a period of between 8 and 10 years in order for him to be self-sufficient in firewood required for curing tobacco and in order to protect the natural environment.

The analysis of the governance structures in respect of the three crops reflects some variations and peculiarities which require some elucidation. The uneven involvement of the state derives from the policy thrust of the government to encourage the private sector to be the leader as far as business and economic activities in the country are concerned while the state is to provide the enabling environment and play the role of a facilitator. The involvement of the government in the rice contract seems to be greater than that of tobacco on account of the food security stance of the government and the need to ensure increased production of rice while the import bill is considerably reduced. Nonetheless, government's involvement is limited to the facilitation of the provision of financial support and supply of fertilizer to enhance the productivity of the rice enterprises and overall success of the scheme. The involvement of the stage agency - Oyo State Agricultural Development Programme (OYSADEP) in the soybean contract derives from the need to enhance adoption of soybean technology in the study area, sustain farmers' interest and enhance the level of productivity and profitability. The agency provided agronomic advice to the smallholders and evaluated advice given to growers by the agribusiness firm over a number of years. OYSADEP acted as an intermediary between smallholders and agribusiness firms in negotiating contracts and facilitating arrangements in contract soybean production. Its role also included contract evaluation, discussion with smallholders, liaison with the agribusiness firm, technical assistance and helping with purchases of farm inputs. It also provided links to credit sources and was actively involved in making and receiving payments.

Unlike the remaining crops all tobacco growers in the country operate under a contract farming arrangement. The value chain in the case of tobacco is far more developed in the country compared to the other crops in the sense that production of the tobacco leaf, processing and manufacture into various brands of cigarette for export take place within the country. In other words whereas other commodities are still being imported as raw materials for industries in other countries, the final export product from the tobacco industry is cigarette. The agribusiness firm involved in the tobacco contract farming designed their contractual relationships directly with farmers to have a win-win situation in which the tobacco growers are exposed to an assured market and alternative means of livelihood. The involvement of tobacco growers association is a way of ensuring transparency and compliance with the terms of the contract. Besides, the emergence of growers association as in the case of tobacco seems to be filling a void or responding to market imperfections. The market is monopsonistic. The agribusiness firm, British American Tobacco Isheyin Agronomy Limited (BATIAL) is the only buyer of tobacco leaf. The growers association therefore, is to strengthen the position of the producers in negotiating the payment of a fair price by the company. The lack of involvement of the government in the tobacco contract

farming scheme is also understandable. The world-wide campaign against smoking and operations of cigarette manufacturers is taken very seriously in Nigeria. As the campaign is being vigorously pursued in the country, government seems not to be willing to be involved in the promotion of tobacco production. The activity is therefore, left in the hands of private entrepreneurs whose operations can go on in line with the provisions of the law.

3.3 Performance of Contract Farming

The contract farming arrangements have been of tremendous benefit to the agribusiness firms and the contract farmers. The former is guaranteed regular supply of raw materials while the latter have access to a ready market for their products. They also derive income which enables them to acquire tangible assets and to finance their children's education. Analytically, the performance of CF is assessed by comparing the level of productivity and profitability in the crop production systems of contract and non-contract farmers using relevant indicators such as yield and labour productivity as well as gross margin and net profit. In what follows we present the results for rice, soybean and tobacco.

3.3.1 Productivity and Profitability Differences in Rice Production

The difference in rice yield between the contract and non-contract farmers is statistically significant. Rice yield for the contract farmers (2,651 kg) is significantly higher than that of the non-contract farmers (1,898 kg). Productivity of hired labour is significantly higher for non-contract farmers than for contract farmers; but there is no statistically significant difference in the use of family labour between the two groups of farmers (Table 3.1).

Profitability of the rice enterprise is measured in terms of gross margin (operating profit) and net profit. Judging by these indicators, both the contract and non-contract rice farmers operate profitably. The profit levels realized by the contract farmers are much higher than that of their non-contract counterpart (Table 3.2). The difference in profitability between the two groups of farmers however, seems not to be significant in statistical sense.

Table 3.1
Comparison of Productivity Among Rice Farmers in Nigeria

	Non-Contract Rice Farmers	Rice Contract Farmers	All Farmers	t-test of difference	
				t-statistic	Prob>|t|
Hired labour productivity ( )	102,776	34,742	68,759	5.21	0.00***
Family labour productivity ( )	11,241	10,348	10,794	0.46	0.64
Rice yield (Kg/Ha)	1,898	2,651	2,274	-1.64	0.10*
Family labour productivity - rice farm ( )	32,453	12,710	22,582	1.29	0.19
Hired labour productivity - rice farm ( )	220,777	43,913	132,345	2.07	0.04**
Rice production cost (/Kg)	7.86	18.06	12.86	-5.95	0.00***
Rice production cost (/Ha)	15,090	36,716	25,903	-5.81	0.00***

Source: Author's computation
Note: ***significant @ one percent level
　　　**significant @ five percent level
　　　*significant @ ten percent level

Table 3.2
Comparison of Profitability Among Rice Farmers in Nigeria

	Non-Contract Rice Farmers	Rice Contract Farmers	All Farmers	t-test of difference	
				t-statistic	Prob>|t|
Rice price N/kg					
Value of output ( )	154,664	136,925	145,794	0.85	0.39
Variable cost ( )	28,198	39,598	33,898	-4.02	0.00***
Gross margin ( )	126,466	97,327	111,896	1.43	0.15
Fixed cost ( )	4,785	13,972	9,378	-3.22	0.00***
Net profit ( )	121,680	83,354	102,517	1.91	0.05**
Income per capita( )	24,714	21,069	22,892	0.70	0.48
Value of rice ( )	92,570	123,107	107,838	-1.55	0.12
Variable cost for rice ( )	14,511	30,724	22,618	-5.60	0.00***
Rice gross margin per farm ( )	58,039	78,779	68,409	-1.08	0.28
Fixed cost for rice production ( )	3,050	11,349	7,200	-3.57	0.00***
Rice net profit per farm ( )	54,988	67,429	61,208	-0.66	0.50
Rice income per capita ( )	11,180	16,558	13,869	-1.19	0.23
Rice gross margin (/kg)	27.44	22.07	24.76	2.30	0.02**
Rice gross margin (/ha)	50,204	69,589	59,897	-1.03	0.30
Rice net profit (/kg)	26.09	17.93	22.01	3.49	0.00***
Rice net profit (/ha)	47,262	59982	53,622	-0.69	0.48

Source: Author's computation

Note: ***significant @ one percent level

     **significant @ five percent level

     *significant @ ten percent level

3.3.2 Productivity and Profitability Differences in Soybean Production

Soybean yield is generally low among the sample farmers. There is no statistically significant difference in the yield (1,050 kg) of the soybean contract farmers and that (1,074 kg) of their non-contract counterparts. Productivity of labour (both family and hired) is significantly higher for non-contract soybean farmers than for contract farmers (Table 3.3).

Profitability of the rice enterprise is measured in terms of gross margin (operating profit) and net profit. Judging by these indicators, both the contract and non-contract soybean farmers operate profitably. The profit levels realized by the contract farmers are much higher than that of their non-contract counterparts (Table 3.4). However, there is no statistically significant difference in profitability between the two groups of farmers.

Table 3.3
Comparison of Productivity Among Soybean Farmers in Nigeria

	Non-Contract Soybean Farmers	Soybean Contract Farmers	All Farmers	t-test of difference	
				t-statistic	Prob>|t|
Hired labour productivity ( )	17,965	5,189	11,577	6.47	0.00***
Family labour productivity ( )	66,616	8,258	37,437	3.04	0.00***
Soybean yield (Kg/Ha)	1,074	1,050	1,062	0.23	0.81
Family labour productivity - soybean farm ( )	70,923	5,373	38,148	2.80	0.00***
Hired labour productivity - soybean farm ( )	17,046	3,115	10,080	5.40	0.00***
Soybean production cost /Kg	18.44	39.41	28.93	-3.70	0.00***
Soybean production cost /Ha	17,501	39,574	28,538	-4.10	0.00***

Source: Author's computation
Note: ***significant @ one percent level

Table 3.4
Comparison of Profitability Among Soybean Farmers in Nigeria

	Non-Contract Soybean Farmers	Soybean Contract Farmers	All Farmers	t-test of difference	
				t-statistic	Prob>|t|
Soybean price /Kg	90	61	76	7.04	0.00***
Value of output ( )	379,478	258,122	318,800	2.48	0.01***
Variable cost ( )	44,839	46,660	45,749	-0.25	0.79
Gross margin ( )	334,638	211,462	273,050	2.74	0.00***
Fixed cost ( )	6,433	18,313	12,373	-3.58	0.00***
Net profit ( )	328,205	193,148	260,676	2.96	0.00***
Income per capita ( )	71,319	49,288	60,303	2.03	0.00***
Value of soya ( )	180,416	165,188	172,802	0.44	0.66
Variable cost for soybean ( )	26,690	46,660	36,675	-4.56	0.00***
Soybean gross margin per farm ( )	180,414	211,461	195,938	-0.93	0.35
Fixed cost of soybean ( )	3,647	18,313	10,980	-4.47	0.00***
Soybean net profit per farm ( )	176,767	193,148	184,957	-0.47	0.63
Soybean income per capita ( )	38,633	49,288	43,960	-1.40	0.16
Soybean gross margin /Kg	102.11	90.12	96.12	102.11	0.19
Soybean gross margin /Ha	101,138	94,912	98,025	0.51	0.61
Soybean net profit /Kg	99.57	76.02	87.80	2.55	0.01***
Soybean net profit /Ha	99,052	80,976	90,014	1.47	0.14

Source: Author's computation

Note: ***significant @ one percent level

3.3.3 Productivity and Profitability Aspects of Tobacco Contract Farming

It is important to reiterate the fact that tobacco contract farming (TCF) in comparison to other commodities included in this study (rice and soybean) is unique in the sense that there is no other group of farmers cultivating tobacco outside a contractual arrangement with an agribusiness (tobacco processing) firm in Nigeria. It is also a non-food commodity. Invariably, farmers' participation in TCF is supposed to be income-enhancing and a way of providing alternative employment opportunities for people in the rural community whose agro-ecology is conducive for tobacco cultivation. The earnings realized from participation in TCF over and above the returns from food crop enterprises, should place the participants in TCF in a vantage position to confront poverty at least from the income front.

Farmers consider the production of tobacco a very strenuous activity especially in view of the various stages involved. Tobacco production begins from the nursery where attention has to be given to all the management practices to ensure proper development of the plants right from the tender age. From the nursery the plant is transplanted to the main field. The field operations also have to be carried out with a high degree of dexterity and timeliness to ensure that products of the desired quality are harvested. After harvesting the next stage is curing after which the cured tobacco are packaged in appropriate bales for transfer to the sales points where the grading and purchase by the contracting firm (BATIAL) will take place. The simple mechanical tools such as hoes and cutlasses are procured by the farmers themselves whereas fertilizer, pesticide and herbicide are supplied by BATIAL. The use of fertilizer and other chemical inputs by the farmers is more or less mandatory under the tobacco contract farming arrangement; not only to ensure that the specified quality is obtained but also to enable the farmers attain the expected level of yield that will guarantee profitability and fulfillment of their loan repayment obligations. In terms of productivity, there is still room for improvement among the farmers. The yield ranges between 560kg/ha and 3,067kg/ha with an average of 1,618kg/ha.

The farmers operate profitably as shown in Table 3.5. When compared to the other crops, gross margin and net profit on per kg basis seem to be higher than that of rice but lower than that of soybean. A similar pattern is also observed when these indicators are expressed on per hectare basis. The per capita income derived by the tobacco farmer is the highest when compared to the other crops (Table 3.6). Given the fact that tobacco farmers also cultivate food crops, their involvement in contract farming is a major source of alternative employment opportunity and economic empowerment which will no doubt have a positive implication for pro-poor growth in the rural sector where the farmers operate.

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Table 3.5
Profitability Among Tobacco Farmers in Nigeria

	Mean	Standard Deviation	Min	Max
Farm size (Ha)	3.40	2.16	1	11
Tobacco price (/kg)	213.6	142	165	220
Value of output ( )	1,258,436	912,478	213,072	4,415,997
Variable cost ( )	685,996.9	340,166	207,946	1,702,335
Gross margin ( )	572,438	687,514	442,744	3,018,213
Fixed cost ( )	30,319	33,959.47	2,480	166,750
Net profit ( )	542,119	681,588	-449,544	2,968,053
Income per capita ( )	101,901	129,678	-88,548	603,642
Value of Tobacco ( )	1,119,637	842,585	213072	3,657,597
Variable cost for Tobacco ( )	453,094	288,437	42,888	1,309,489
Tobacco gross margin per farm ( )	340,316	427,039	-236130	1,813,507
Fixed cost for Tobacco production ( )	20,981	28,770	1224	166,750
Tobacco net profit per farm ( )	319,334	418,312	-239756	1,774,907
Tobacco income per capita ( )	60,896	79,910	-47226	362,701
Tobacco gross margin (/kg)	48.65	51.04	-118	257
Tobacco gross margin (/ha)	86,678	83,345	-147581	319,101
Tobacco net profit (/kg)	44.46	51.51	-119	255
Tobacco net profit (/ha)	80,102.13	82,297.37	-149848	306411.6

Source: Author's computation

Table 3.6
Comparison of Contract Farming Enterprise Profitability in Nigeria

	Rice Contract Farming Enterprise	Soybean Contract Farming Enterprise	Tobacco Contract Farming Enterprise
Value of Output ( )	123,107.00	165,188	1,119,637.00
Variable cost ( )	30,724.00	46,660	453,094.20
Gross margin per farm ( )	78,779.00	211,461	340,316.00
Fixed cost ( )	11,349.00	18,313	20,981.41
Net profit per farm ( )	67,429.00	193,148	319,334.60
Crop income per capita ( )	16,558.00	49,288	60,896.19
Gross margin (/kg)	22.07	90.12	48.65
Gross margin (/ha)	69,589.00	94,912	86,678.56
Net profit (/kg)	17.93	76.02	44.46
Net profit (/ha)	59,982.00	80,976	80,102.13

Source: Author's computation

3.4 Determinants and Impact of Participation in Contract Farming

3.4.1 Results of Econometric Analysis of Participation in Rice CF and Its Impact on Income

The econometric analysis seeks to examine the differences in the characteristics and the determinants of participation in rice contract farming as well as the impact of participation on income following a three-step analytical procedure. First, a probit model is estimated to determine the key characteristics that influence participation in rice contract farming. The explanatory variables in the model are age of head of household, household size, education of head of household, farm size, crop mix and land available for rice production. The results show that the model is able to correctly predict which farmers will have contracts in 78 percent of the cases in the sample. As shown in Table 3.7, household size, education of head of household, farm size and crop mix are not significantly related to the probability of contracting in rice production. The significant predictors of participation in rice contract farming are age and availability of land.

Table 3.7
Probit Model of Participation in Rice Contract Farming

Dependent Variable: Contract Participation Dummy (Conpart)

Variable	Coefficient	S.E.	P[|Z|>z]
Age of head	0.086***	0.024	0.00
Household size	-0.088	0.086	0.30
Education of head	0.010	0.044	0.81
Crop mix	0.243	0.154	0.11
Farm size	0.375	0.368	0.30
Land available	-0.895***	0.212	0.00
Constant	-2.020*	1.234	0.10
Log likelihood = -46.16			
LR chi2(6) = 46.30			
Prob > chi2 = 0.00			
Number of obs = 100			

% Correct predictions = 78%

Actual	Predicted		Total
	Contract	Non-contract	
Contract	40	10	50
Non-contract	12	38	50
Total	52	48	100

Source: Author's computation
Note: ***significant @ one percent level
          *significant @ ten percent level

The impact of participation in rice contract farming is examined in a regression of per capita income as a function of the various household characteristics and a dummy variable ('conpart') representing contract farmers. Table 3.8 presents the estimation results which show that per capita income of rice farmers is not significantly affected by age of head of household, education of head of household, farm size, crop mix and land available for rice production. The coefficient on the 'conpart' variable is positive but not statistically significant; implying that contracting has no significant impact on per capita income of rice producers. This result is possibly due to the effects of selection bias.

In order to correct for the effects of selection bias another variant of econometric analysis is applied. Thus, instead of estimating the per capita income using OLS model, the Heckman selection-correction model also known as treatment effects model is used. The model involves two equations- the selection equation which estimates the probability of participating in contract production and the outcome equation which estimates per capita income as a function of the household characteristics, the contract dummy variable and the inverse Mills ratio (IMR). The IMR calculated from the selection equation, adjusts the outcome equation for selection bias associated with the fact that rice contract farmers and non-contract farmers may differ in unobservable characteristics (such as entrepreneurial skills and risk attitude). In the analysis, the maximum likelihood estimation technique is adopted; in which case all parameters are estimated simultaneously rather than the conventional Heckman two-step procedure. The results of the treatment effects model are presented in Table 3.9.

The selection equation which predicts participation in the rice contract farming scheme gives results that are different from those of the probit model in Table 3.7. According to the probit model, the significant predictors of participation in rice contract farming are age and availability of land. On the basis of the selection equation in the treatment effects model, however, the predictors are age, crop mix and availability of land. Indeed, as shown in Table 3.9, the parameter 'athro' which is related to rho( ), the correlation between the error terms in the selection equation and the outcome equation is statistically significant implying that there is selection bias in the previous specification of the model. Evidently, the results of the outcome equation which predicts per capita income are diametrically different from those of the OLS model in Table 3.8. In the OLS model, household size is the only significant determinant of per capita income. In the treatment effects model, however, the estimated outcome equation shows that household size, crop mix and the 'conpart' dummy are significant variables. The coefficient of the 'conpart' variable contrary to the OLS model is positive and statistically significant; implying that the impact of contracting of rice production on per capita income is positive and statistically significant. The results confirm that contracting raises per capita income by 13,957 which is equivalent to 61 percent of the average income of rice producers across the sample.

Table 3.8
Regression Analysis (OLS) of Per Capita Income of Rice Farmers

Dependent Variable: Household Income Per Capita

Variable	Coefficient	S.E.	P>|t|
Age of head	348.61	364.26	0.34
Household size	-2,792.72**	1,199.68	0.02
Education of head	142.75	643.00	0.82
Crop mix	3,089.51	2,041.80	0.13
Farm size	4,000.79	5,345.29	0.45
Conpart	3,062.41	4,843.87	0.52
Constant	1,086.828	17,066.68	0.94
F(6, 93) = 2.16 Prob > F = 0.05 Adj R-squared = 0.06 Number of obs = 100			

Source: Author's computation
Note: **significant @ five percent level

Table 3.9
Treatment Effects Model of Per Capita Income of Rice Farmers

Variable	Coefficient	S.E.	P[|Z|>z]
Selection Equation **Dependent Variable: Conpart**			
Age of head	0.085***	0.024	0.00
Household size	-0.098	0.086	0.25
Education of head	0.001	0.045	0.98
Crop mix	0.274*	0.149	0.06
Farm size	0.468	0.375	0.21
Land available	-0.982***	0.203	0.00
Constant	-1.855	1.234	0.13
Outcome Equation **Dependent Variable: Per Capita Income**			
Age of head	16.10	378.34	0.96
Household size	-2,769.12**	1,188.00	0.02
Education of head	-127.84	643.47	0.84
Crop mix	3,259.67*	2,022.73	0.10
Farm size	5,463.71	5,316.92	0.30
Conpart	13,957.30**	6,082.39	0.02
Constant	8,126.24	17,072.12	0.63
ath(rho)	-0.43***	0.16	0.00
LR test of independent equations: (rho=0) Chi2(1) = 5.05 Prob > Chi2 = 0.02 Number of obs = 100			

Source: Author's computation
Note: ***significant @ one percent level

**significant @ five percent level
        *significant @ ten percent level

3.4.2 Results of Econometric Analysis of Participation in Soybean CF and Its Impact on Income
The econometric analysis seeks to examine the differences in the characteristics and the determinants of participation in soybean contract farming as well as the impact of participation on income following a three-step analytical procedure. First, a probit model is estimated to determine the key characteristics that influence participation in soybean contract farming. The explanatory variables in the model are age of head of household, household size, education of head of household, farm size, and land available for soybean production. The results show that the model is able to correctly predict which farmers will have contracts in 72% of the cases in the sample. As shown in Table 3.10, education of household head and farm size are not significantly related to the probability of contracting in soybean production. The significant predictors of participation in soybean contract farming are age of household head, household size and availability of land.

Table 3.10
Probit Model of Participation in Soybean Contract Farming

Dependent Variable: Contract Participation Dummy (Conpart)

Variable	Coefficient	S.E.	P[|Z|>z]
Age of head	0.038*	0.022	0.08
Household size	-0.309*	0.182	0.08
Education of head	-0.009	0.035	0.79
Farm size	0.237	0.150	0.11
Land available	-0.021*	0.011	0.06
Constant	-0.602	1.709	0.72
Log likelihood = -34.91			
LR chi2(5) = 13.35			
Prob > chi2 = 0.02			
Number of obs = 60			

% Correct predictions = 72%

Actual	Predicted		Total
	Contract	Non-contract	
Contract	24	6	30
Non-contract	11	19	30
Total	35	25	60

Source: Author's computation
Note: *significant @ ten percent level

The impact of participation in soybean contract farming is examined in a regression of per capita income as a function of the various household characteristics and a dummy variable ('conpart') representing contract farmers. Table 3.11presents the results of the model which explains about 56% of the variation in per capita income across the sample. The results show that per capita income of soybean farmers is not significantly affected by age and education of head of household. The coefficient on the 'conpart' variable is not statistically significant; implying that contracting has no significant impact on per capita income of soybean producers. This result is possibly due to the effects of selection bias.

In order to correct for the effects of selection bias the analytical technique is modified. Thus, instead of estimating the per capita income using OLS model, the Heckman selection-correction model also known as treatment effects model is used. The model involves two equations- the selection equation which estimates the probability of participating in contract production and the outcome equation which estimates per capita income as a function of the household characteristics, the contract dummy variable and the inverse Mills ratio (IMR). The IMR calculated from the selection equation, adjusts the outcome equation for selection bias associated with the fact that soybean contract farmers and non-contract farmers may differ in unobservable characteristics (such as entrepreneurial skills and risk attitude). In the analysis, the maximum likelihood estimation technique is adopted; in which case all parameters are estimated simultaneously rather than the conventional Heckman two-step procedure. The results of the treatment effects model are presented in Table 3.12.

The selection equation which predicts participation in the soybean contract farming scheme gives results that are different from those of the probit model in Table 3.10. Based on the probit model, the significant predictors of participation in soybean contract farming are age, household size and availability of land. On the basis of the selection equation in the treatment effects model, however, the predictors are only household size and farm size. Moreover, the results of the outcome equation which predicts per capita income are also different from those of the OLS model in Table 3.11. In the OLS model, household size and farm size are the only significant determinants of per capita income. In the treatment effects model, however, the estimated outcome equation shows that household size, farm size and the 'conpart' dummy are significant variables. The coefficient of the 'conpart' variable contrary to the OLS model is statistically significant; implying that the impact of contracting of soybean production on per capita income is negative and statistically significant. The results confirm that contracting reduces per capita income by   33,968 which is equivalent to 56% of the average income of soybean producers across the sample.

The foregoing analysis reveals that the impact of the contract farming schemes on per capita income is mixed. It is positive in the case of rice and negative in respect of soybean. Soybean farmers have always argued against the seemingly non-competitive pricing mechanism of their 'contractor' company. The observed finding may therefore, not be unconnected with the unremunerative prices paid for their products. It is also a reflection of the power being wielded by the company in the selection and negotiation of the terms of the contract; and this applies to all the contracting firms in general. Usually, there is no self-selection on the part of the participants in the contract farming arrangements. It is important to distinguish between selection by the agribusiness firm and self-selection because with self-selection smallholders with most to gain would be the ones most likely to enter contracts. In general, smaller more constrained enterprises that were not doing well in the spot market system would have strong incentives to negotiate contracts. Alternatively, if selection is by agribusiness firms, larger, less constrained smallholders with lower unit costs and less risk exposure could be the most

attractive partners. In selecting and registering farmers for the contract the agribusiness firms pay particular attention to the previous farming experience of

Table 3.11
Regression Analysis (OLS) of Per Capita Income of Soybean Farmers

Dependent Variable: Household Income Per Capita

Variable	Coefficient	S.E.	P>|t|
Age of head	-7.69	306.47	0.98
Household size	-9,984.47***	2,601.28	0.00
Education of head	797.31	522.17	0.13
Farm size	16,403.35***	2,091.75	0.00
Conpart	-2,422.94	5,481.28	0.66
Constant	49,067.16**	24,925.99	0.05
F(5, 54) = 16.07			
Prob > F = 0.00			
Adj R-squared = 0.56			
Number of obs = 60			

Source: Author's computation
Note: ***significant @ one percent level
        **significant @ five percent level

Table 3.12
Treatment Effects Model of Per Capita Income of Soybean Farmers

Variable	Coefficient	S.E.	P[|Z|>z]
Selection Equation			
Dependent Variable: Conpart			
Age of head	0.031	0.026	0.24
Household size	-0.271*	0.167	0.10*
Education of head	-0.0006	0.032	0.98
Farm size	0.256*	0.149	0.08*
Land available	-0.013	0.012	0.26
Constant	-0.771	1.609	0.63
Outcome Equation			
Dependent Variable: Per Capita Income			
Age of head	286.2875	402.56	0.47
Household size	-13,878.76***	3,785.64	0.00***
Education of head	761.14	629.52	0.22
Farm size	18,288.42***	2,721.94	0.00***
Conpart	-33,968.13*	18,419.46	0.06*
Constant	64,079.58**	31,130.43	0.04**
ath(rho)	1.229	0.862	0.15
Log likelihood = -709.06			
LR chi2(9) = 67.06			
Prob > Chi2 = 0.00			
LR test of independent equations: (rho=0)			
Chi2(1) = 1.69			
Prob > Chi2 = 0.19			
Number of obs = 60			

the smallholder, availability of potential land for the cultivation of the crop to be produced, current farm size and fertility of the farm and other socio-economic considerations such as level of indebtedness and membership of community associations. Such firms thereafter design mechanisms to minimize the risk of default.

It is important to stress that the market constraints faced by farmers in the study areas are common to the smallholders. The severe resource constraints in terms of lack of access to credit facilities, extension services and high yielding crop varieties as well as output market constraints in terms of low output prices, lack of storage and deficiencies in transportation infrastructure are the real motivations for the smallholders for signing up for the resource-providing contracts. Medium- and large-scale farmers who do not face these problems in the same proportion as the smallholders would have been better partners to the agribusiness firms. They can undertake more production hence overheads associated with the contract will be a smaller proportion of total costs. This means costs incurred by the firm for provision of extension information and farm visits, purchase of equipment and other capital outlays associated with establishment of farms will be lower per unit of contracted output. Moreover, large growers are better positioned to bear crop risk, may already possess expertise in crop husbandry and labour management and often have storage and transport facilities (Wilson, 1990). Besides, large growers are better able to manage quality, their produce is less likely to be pooled hence is more easily traced if quality problems occur and they can achieve economies of scale in audit and record keeping (Runsten, 1992). With these size advantages and lower contractual risks, such farms can afford to be paid lower prices than smaller farmers. Smallholders may not be in a position to cope with lower output prices than what actually prevails in spot markets. In Nigeria, smallholders are the main participants in contract farming. These are farmers considered to be in a helpless situation; and so when help comes their way in the form of contract farming, they find themselves lucky if they are selected by the agribusiness firms. It is therefore, not surprising that the contractual arrangements have had positive impact on per capita income of farming households included in this study with the exception of soybean.

The results are consistent with a number of recent studies on contract farming in other developing countries. For instance, it has been found that gross returns in CF systems are (almost three times) much higher than returns from traditional crops of wheat, paddy and potato in the case of tomato CF (Haque, 2000; Rangi and Sidhu, 2000; Dileep et al; 2002) and cotton CF (Agarwal et al, 2005) due to higher yield and assured price under the CF arrangements. Studies of tomato (Haque, 2000; Dileep et al, 2002), cucumber (Haque, 2000) and cotton (Agarwal et al, 2005) in India also found the net returns from these crops under CF to be much higher than those under non-CF situation though production cost in tomato was higher under CF. More recent studies across crops, companies and locations also confirm higher net returns under CF than the non-contract situation due to higher yields and higher output prices even in circumstances where the cost of cultivation by non-contract farmers was higher (Tripathi et al, 2005; Kumar, 2006).

Other recent studies which employed the case study approach have also revealed successful performance of CF in several parts of the world (Singh, 2005a, 2005b, Saenz-Segura; 2006; Singh 2007). In India for instance, Singh (2007) noted that the agribusiness sector faced problems in getting quality raw materials for processing or fresh marketing,

especially in perishable high value crops. The processing and marketing firms faced issues of high cost, lack of adequate availability, poor quality and timeliness. At the same time, there were gluts in markets for such produce and farmers realized low or un-remunerative prices. After the opening up of the Indian economy and entry of many domestic and multinational players into agribusiness sector, contract farming which was restricted, largely to seed production earlier, spread to perishable produce and has now become the dominant and growing mode of raw material production and procurement coordination among the processors and fresh produce marketers and exporters. According to the author the major conditions for successful interlocking between agribusiness firms and small producers include increased competition for procurement instead of monopsony, guaranteed market for farmer produce, effective repayment mechanism, market information for farmers to effectively bargain with companies, large volumes of transactions through groups of farmers for lowering transaction costs and the absence of alternative source of raw material for firms. The study by Saenz-Segura (2006) in Costa Rica, identified which type of farm households and processing firm can participate in contract farming and under which conditions. His case studies proved that contract farming could become a suitable institution with implications in terms of equity, efficiency and sustainability thus contributing to the understanding of the outcomes of contracting for the involved agents.

The reasons for success in the Nigerian contract farming schemes include (i) lack of barriers to exit, (ii) positive impact on per capita income, (iii) farming experience, (iv) strong demand for the product, (v) prevalence of remunerative prices and (vi) favourable exchange rate policy. Besides, the governance mechanisms do affect the success of the contracts with implications for poverty reduction, equity and growth. The contracts (in respect of rice, soybean and tobacco) are resource-providing and they enhance farmers' access to productive inputs and credit facilities thus leading to increased productivity and profitability. And with the observed positive income effect especially in the case of rice and tobacco, they have bright prospects for higher growth and poverty reduction.

4. Policy Implications

The results of the profitability and impact analyses indicate that the governance structures have implications for the performance of CF in terms of its potential to promote growth and reduce poverty. The varying levels of performance constitute a reflection of differences in governance structures among the three crops. The contractual arrangement should involve the control of abuse of market power through the regulatory role of government. The lack of control of such power is responsible for the worst performance observed in the case of the rice CF despite the fact that the contract scheme has both resource-providing and market-specification components, and the negative income impact in the case of soybean. The governance mechanisms put in place by Olam place much emphasis on the minimization of the risk of default and thus provides incentives to encourage farmers to sell their products and thus ensure full recovery of the loans advanced at the commencement of planting. In spite of the marketing incentives, the company found it difficult to achieve full recovery and to convince farmers to bring all their output to the company's factory for sale. The key issue here is the price being offered by Olam. Despite increases in the price from time to time, farmers discovered that the profit margin allowed remains unattractive. The company has to compete with imported rice which sometimes is being encouraged by government's food security policy. The problem of cheaper rice imports was exacerbated in 2008 by weak US dollar; and this has tended to limit the price increases which Olam could offer to the participating farmers. The government has a role to play in maintaining a stable and favourable policy environment to encourage domestic production and ensure that the small-scale rice producers derive the expected benefits from participating in contract farming

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schemes. Agribusiness firms must weigh the balance between transaction cost reduction and reduction in the price being offered to farmers for their products. If generous incentives are provided with the intention of minimizing contract default and unfair prices are offered to the farmers as their products are being purchased, it will be difficult to achieve full recovery of the credit granted to the farmers in advance of production activities and this may jeopardize the success of the scheme as farmers may tend to disengage or divert their products to spot markets.

5. Conclusions

Formal and informal institutional linkages involving agribusiness firms and smallholder farmers in Nigeria is moving towards a win-win situation as far as contract farming arrangements for rice, soybean and tobacco are concerned. Contract farming in Nigeria develops in response to the critical resource constraints faced by farmers, the need to raise the quality of the concerned commodities and address the technical difficulty associated with the production of crops, the business specialty and reputation of the contractors and the requirements of the export market. The small-scale farmers encounter severe constraints that limit their potential to increase productivity and income. They lack information about production methods and market opportunities, particularly for crops that they do not normally grow. Even with sufficient information about profitable investments, small farmers have low savings and often lack the necessary equity capital. Access to credit is limited by the lack of collateral and high interest rates demanded by formal and informal lenders. As part of the CF arrangements, agribusiness firms provide technical assistance, specialized inputs and credit both in kind and cash. With appropriate governance structures and improved risk management it has been possible to tackle these constraints simultaneously to a reasonable degree in Nigeria.

The need to raise the quality of the concerned crops is also an important motivation for the development of CF in the country. Farm-level investments in human and physical capital, or specialized inputs are needed to raise quality. CF provides farmers the incentives and the means to make these specific investments especially in the case rice, soybean and tobacco. Farmers may not enter into the production of technically difficult crops such as tobacco and rice, because they do not have the technical skills, the inputs and the credit needed. The contract allows the buyer to provide them on credit and to recover the cost of the inputs by deducting it from the payment to farmers after harvest. The companies involved are large-scale processors, exporters, or wholesalers that are preferred suppliers to some markets. With large capital-intensive processing plants they have the motivation to engage in contract with farmers because they need a steady and reliable flow of raw materials to maintain a high capacity-utilization rate. The type of destination market for some of the commodities is another motivating factor for the contract farming models. The export market for rice and tobacco are highly quality-sensitive. This provides the motivation for the companies (and exporters) to increase control over the production process through contract farming.

It is found that contract farming in respect of the various commodities is basically resource-providing and market specification in nature while operationally it is characterized by centralized and multi-partite models. The major benefits of contract farming to farmers are improvement in productivity and profitability, improved access to markets, better product quality and enhanced access to fixed assets. On the part of participating firms, the linkage has resulted in sustainable supply of raw materials of higher quality, better international market access and less complicated marketing chain. Nonetheless, there are a number of constraints on the performance of the contract farming system including high cost of transportation, inadequate supply of modern inputs (e.g. fertilizer) and poor culture of loan repayment among farmers. The observed institutional linkages are supportive of pro-poor growth. In

general, the contract farming schemes are designed primarily for small-scale farmers; thus the problem of exclusion of this category of poor farmers from contracting does not exist in the country. The farmers are operating profitably and rising profitability over and above what is possible among non-contract farmers is a major driver towards improved welfare. To improve the situation there is need to involve ethnic group leaders and traditional rulers in resolving lingering conflicts, introduce training and capacity building incentives into the contract farming schemes to enhance productivity, product quality and loan repayment. Moreover, the government should sensitize and enlighten farmers on the use of weights and measures in agribusiness to ensure standardization and avoid cheating and adulteration of products; and the entire system must be guided by appropriate legislative framework. Such legislation should encourage agribusiness firms to initiate new contracts in various parts of the country, provide support to smallholders to make them operate profitably through payment of fair prices and ensure that the firms do not abuse their market power.

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