OIL PALM PLANTATION DEVELOPMENT AND MANAGEMENT IN NIGERIA- A CASE STUDY OF ABIA STATE

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ABSTRACT

An assessment of oil palm plantations in Abia State of Nigeria was carried out in this study. It was revealed that majority of the plantations (88%) were in the small scale group with 67.5% acquiring land through inheritance. Most of the plantations (about 76%) were generally old. Cost of establishment and maintenance depends on plantation size. Plantation maintenance is carried out haphazardly. Harvesting and haulage of fruit is not standardized. However majority of the plantations are closer to the mills. Despite the inadequate management practices, oil palm was adjudged to be more profitable than other crops grown in the State. Intervention plans featuring acquisition and planting of improved seeds/seedlings, best plantation management practices (in terms of maintenance, harvesting and haulage of fruit) as well as introduction of organized plantations scheme are proposed.

Keywords: Oil palm, plantations, management, fruit production, productivity.

1. INTRODUCTION

Nigeria used to be a major exporter of vegetable oil in the 1960s but today has a supply deficit of over 300,000 tonnes of vegetable oils annually even though annual domestic production is still estimated at as much as 1.3 million tonnes with palm oil and palm kernel oil contributing 72%, groundnut oil contributing 23% while other crops, such as soybean, cottonseed, coconut, melon and castor share the balance (RMRDC, 2004). Oil palm is the most prominent oil bearing crop in the country, in terms of quantity consumed directly or processed into oil and cake. The three commercial products obtained from processing of the ripe fresh fruit bunch from the oil palm tree are crude red palm oil, palm kernel oil and palm kernel cake or meal. The oil palm flourishes primarily in the rain forest and derived savannah belts of the country. Palm oil is consumed in the home in the preparation of soup. Bleached and refined palm oil is used in the manufacture of margarine and for confectionary, ice – creams, soap, and filled milk or cocoa butter substitutes. Palm kernel oil is used in the manufacture of artificial cream filings, soap, cosmetic and personal care products as well as emulsifiers in the food processing and pharmaceutical industry and the

production of toiletries, tobacco, alkyd resins, paints and varnishes, cellophane, explosives, polyurethane etc. Palm kernel cake is used as livestock feed (RMRDC, 2004, Owolarafe, 2007).

The low yielding indigenous dura variety is estimated to cover over 2.3 million hectares (and provide over 50% of national palm oil and palm kernel output) (Badmus, 1991; RMRDC, 2004). Plantings of the improved tenera variety cover only about 200,000 hectares made up mainly of small size holdings. The large and medium sized plantations cover about 80,000 hectares. Yields from the more dominant indigenous species are less than one quarter the yield from the improved varieties.

Production of palm oil and palm kernel oil has increased in the last 10 years but there is still substantial deficit and local prices of palm oil and palm kernel oil are about twice the international prices. In a bid to encourage local production of palm products to satisfy local demand, importation of bulk crude and refined vegetable oil was prohibited in 2001. In response to this ban and increasing demand, there has been some increase in private sector investment in the development of new oil palm plantations and the expansion of existing ones. Smallholdings and out grower's schemes are also being promoted by the Federal and State Governments. Demand for sprouted nuts and seedlings from Nigerian Institute for Oil Palm research (NIFOR) by farmers has increased. NIFOR is currently the only sure source of sprouted nuts of the improved variety and in 2003; it supplied a total of 3.1 million high yielding resistant tenera hybrid variety sprouted seeds mainly to state governments (which provides assistance to small growers) but also to many farmers. It is estimated that 80% of oils produced come from micro, small and medium scale processors who are scattered all over the producing States. About 90% of all palm oil produced is used for food purposes; the remaining 10% goes into non-food applications. Demand is not met by supply on and off the peak season. Local palm oil production meets less than 50% of industrial users raw material needs and the average market price of locally produced palm oil is double international price (Faborode, 2003). Manufacturers are therefore importing cheaper oil to meet their needs. This provides less opportunities for local producers, predominantly the rural poor, who could benefit from supplying industrial processing equipment It has been reported that many of existing oil palm plantations in Nigeria are over-aged, poor yielding, poorly managed/maintained and/or applying little or no modern agricultural inputs. Consequently, average yields are as low as 5-6 tons per hectare compared to potential yields of 15-20 tons per hectare under proper management conditions.

Agriculture is the major occupation of the people of Abia State. This is induced by the rich soil which stretches from the northern to the southern parts of the state. Subsistence farming is prevalent and about 70 per cent of the population is engaged in it. Few farmers also produce on a large scale. Farming in the state is determined by the seasonal distribution of rainfall. Some farmers now use irrigation methods. The main food crops grown are yam, cassava, rice, cocoyam and maize while the cash crops include oil-palm, rubber, cocoa, banana and various types of fruits.

There are three agricultural zones in Abia State: Aba, Umuahia and Bende. In the Aba and Umuahia agricultural zones, such cash crops as palm produce, cocoa and rubber are produced, while food crops such as yam, cassava, rice, plantain, banana, maize and cocoyam are produced in large quantities. Oil palm is the major oil crop in Abia and its production is quite high in the state. Abia is the 9th largest producer of oil palm with substantial processing activities. Over 75% of the trees grow in the wild although there are few aged plantations established since the 1960. Most of the trees are old and this affects their yield with overall

negative impact on production levels which are therefore low. The state government has been making efforts at resuscitating the oil palm sector through the purchase of improved seedlings and distribution to the farmers. About 150,000 farm families are involved in production, processing and marketing of palm produce including palm oil. Total land area under oil palm cultivation is estimated at 166,000 ha and production is dominated by women. The farmers are well organized into associations for example there are over 10,000 members of the oil palm growers' association in Abia. The oil palm growers' association members produce ffb, palm oil, palm kernel and palm kernel oil. Inputs used by producers include seedlings, agrochemicals, fertilizers and potty mixtures. The seedlings are sourced from NIFOR, the wild and from the Ministry of Agriculture while they buy fertilizers from the open market. Inputs are easily sourced although they are sometimes scarce ((RMRDC, 2004; Beveridge et al., 2009).

Realizing the problems of low output of the plantations, the attendant problems and the potentials, the World Bank through the National Investment and Promotion Council provided a support for the development of palm oil value chain in Abia State as one of the key players in the Nigerian palm oil industry. This study was conducted to generate data on the current status of oil palm plantations in Abia State with a view to providing an insight to the development of the value chain that will improve on the production of palm oil and the livelihood of the farmers and processors.

2. Methodology

The study was conducted using well-structured questionnaires. Data on background information of the plantations in terms of age, size and ownership were collected. Methods of plantation maintenance, harvesting, haulage and marketing of palm fruits as well as profitability of oil palm cultivation in the State were also part of the data collected. Field observations were also made during the course of the survey. Data were collected from about fifty plantations in the three agricultural zones of the State. The data were statistically analyzed using the statistical package (SPSS, 2002).

3. Results and Discussion

The results obtained from the assessment are under the headings outlined below.

3.1 Distribution of Plantation Size

Tables 1 shows the distribution of sizes of the plantations of the farmers within the sample. It could be observed that 88% of the total number of the respondents belong the group of farmers with farm in the range of 1-5ha, while 6% and 6% represent those in the categories of 6-10 ha and more than 10 ha, respectively. The implication of this result is that the majority of the farmers operate on a small scale. The size of the farms is guided by the land tenure system within the communities. The majority of those in the range of 1-10 ha or acres had their plantations on inherited land while those with a large hectarage purchased the land. This is typical of what exists in India palm oil Industry and agriculture in general (Owolarafe and Arumughan, 2007).

3.2 Mode of Land Acquisition for Plantations

About 67% of the total farmers interviewed had their land by inheritance (Table 2). Majority of this group also falls into those with plantation sizes in the range of 1-5 ha. This is a true picture of land tenure system in any Nigerian States and West African Countries. Most lands used for farming by indigenes are inherited. The group of farmers that purchased land consist mainly of those with large hectarage and non-indigenes. In addition some indigenes purchased land to augment the one they have so as to meet the hectarage demand for the plantation (about 10% of them). Others got additional land through lease to make up and this group constitute about 2%. Purchase and lease group amount to about

9%. The last group consists of non-indigenes.

3.3 Types of Palm Grown

Table 3 shows the distribution of the types of palm grown by the farmers. Majority of the farmers planted tenera specie on their plantations while about 4% cultivated dura and 13.5% cultivated both. This scenario is an indication that there is a lot of awareness on high-yielding oil palm variety. Those who had dura fall into the group of farmers who inherited wild palms. In most of the communities , the wild palms are owned by the entire community as one and not individual. Interested Individual needs to seek for permission to harvest the fruits.

3.4 Distribution of Age of Plantations

About 76% of the total respondents had their plantation more than 10 years old, In actual fact most of the plantations were established in the 1960s and 70s. Record had it that there was a revolution on the cultivation of oil palm in the Eastern Region of the country by then (Beveridge et al. 2009). This was prompted by the international trade during the colonial era. Those plantations between 1-5 and 6-10 years constitute 12% respectively.

3.5. Cost of Establishment of Plantations

Tables 5 shows the cost of establishment of plantations. All the farmers with plantation size of between 1-5 ha spent between N21-30,000 in the establishment of their plantations; those within 6-10ha and greater than 10 ha spent more than N30,000.00 on plantation establishment. The cost of plantation establishment covers procurement of seedlings, land clearing, planting and protection against pests in the early years. In some cases it includes cost of land acquisition especially for those with hectarage greater than 6. As would be expected the larger the size of plantation the higher the cost of establishment of plantation.

3.6 Plantation Maintenance

About 10%, 48% and 42% apply fertilizer quarterly, annually and twice in a year (Table 6). Those who apply fertilizer quarterly were observed to be in the group of plantation with age between 1-5 years. The rest have their plantations more than 10 years. As a matter of fact the great majority of organized tenera plantations were over 20 years of age. Chemical fertilizer procurement is a serious issue within the area. The farm input is very scarce and when available usually in trickles is very costly, the price being beyond the reach of the average farmers. This adversely affect productivity of the palms. Palms in many of the plantation visited were not in good conditions showing deficiency of certain nutrients. Fig. 1. shows typical plantation in Abia State. A few of the farmers have adopted the use of organic manure. A particular farmer in Aba area has compost for the production of organic manure for all his farms using integrated farming system.

Weeding of plantations is done at different intervals by the farmers. Substantial percentages, 44% and 40% respectively, weed their farm annually and twice in a year. The majority of these two groups were observed to have their plantations fully established and more than 10 years old. This is expected since the trees would have formed canopies on the plantations thereby preventing rapid growth of weeds being experienced in the young palm plantations. Those who weed their farms monthly, bimonthly, quarterly and thrice in the year constitute 4%, 2%, 6% and 4% respectively. These fall into the group of farms with young palms below 10 years of age. However it was generally observed that farmers do not maintain their plantation very well. In most of the plantations the palms are left to compete with weeds. Fig. 2 shows a palm competing with weeds in a plantation. However, there was a farm which is well maintained in terms of weeding. The farm had the palm trees intercropped with some annual crop (Fig. 3)

Plantation management is very important in oil

palm cultivation as it determines the profitability of the business. The useful life of a plantation has two main phases. The first phase is the early period during which the growing tress are not yet productive and this last for lasts for 2-4 years depending on soil and climatic conditions (Tropical Agriculturalist, 1998). The second phase is the productive period which lasts for 20-30 years. Duke (1983), Tropical Agriculturalist (1998) and Hartley (1988) enumerated the activities needed for this phase as weeding, pest control, fertilizer application, disease prevention and treatment and pruning. For immature plantation, ring weeding either by chemical of manual method, is done nine times during the first year of the plantation. In large plantation where manual labour is scarce, the most commonly used method of combating invasion of weeds such as pueraria is to apply contact or systemic herbicides in a ring round the outer edge of the weeded area; during the second and third years. Owolarafe and Arumughan (2007) reported that monitoring of the young trees to detect pest and disease problems is important. This can be achieved by routine survey of the whole plantation. Fertilizers application depends on the age of the trees. When plants are young it is best to apply fertilizer in two, three or four separate dressings. The elements usually applied are nitrogen, phosphorus, potassium and magnesium. The quantity applied varies from soil to soil.

Pruning is the operation of removal of unwanted palm trees leaves. Such leaves are those that are left at the base of the crown after harvesting. These leaves in the long run impede harvesting and they can even make it impossible in tall trees by masking the ripe bunches. The degree of pruning depends on the age of trees.

Most of the farmers do not apply plantation management techniques enumerated above. Well managed palms are expected to yield about 16 tonnes per hectare at maturity. The yield of most of the plantations is estimated at 4-6 tonnes per hectare owing to bad management practices. This is an important aspect of Abia Oil plantation development that needs to be properly addressed.

3.7 Cost of Plantation Maintenance

Fig. 7 shows the distribution of cost of maintenance on famers' plantation. For farmers with farm sizes between 1-5 ha about 6.3% of the total number of farmers spent between 1-5,000.00 on plantation maintenance. In the same group of farmers 3.1% each spent N6 – 10,000.00 and 11-15,000.00 and 12.5% spent between 16-20,000.00. About 75% of this group of farmers spent more than N 20,000.00 on plantation maintenance. Those with farm sizes between 6-10ha and greater than 10 ha all spent more than N20,000.00 for plantation maintenance. The maintenance activities cover fertilizer application, weeding and pruning. Pruning was observed to take a lion share of the cost followed by weeding especially for young palms. Very few of the farmers apply fertilizer.

3.8 Harvesting Schedule of Palm Fruit

A substantial percentage (59%) harvest their fruits monthly (Table 8). This is followed by those who harvest fortnightly (25%). Only 2%, 6%, 6% and 2% harvest their palm fruit weekly, every three weeks, bimonthly and quarterly, respectively. The farmers who harvest monthly based the schedule on ripening of fruit. Those who harvest weekly and fortnightly fall into the group of farmers with large heactarage of plantation but couldn't get adequate number of climbers to harvest the fruit at once. Harvesting for a particular period continues and overlaps into the next period. Farmers harvesting bimonthly and quarterly belong to the group of farms with old palm plantation and wild palms. The main objective in managing a plantation is to obtain maximum quantity of high quality oil at lowest possible cost .(Owolarafe and Arumughan, 2007). In order to achieve this, all bunches, together with loose fruits must be harvested at optimum maturity, collected and taken to the processing plant as quickly as possible. The number of bunches harvested

from each tree ranges from 4 - 20 per year. Efficient harvesting requires an accurate forecast of yields. The optimum point at which to harvest is a trade off which must be struck in such a way that the bunch has maximum number of loose fruits and acceptable level of acidity.

Factors influencing maturation and level of fruits include climate, age of tree and genotype and the interval between harvesting and processing among others. To ensure a high quality harvest, two or four harvesting operations should be allowed in a month especially when production is at a level of 800kg/ha or more.

3.9 Plantation Distances to Mill

Table 9 shows the distribution of distances of farmers' plantations to mills. About 72.5% of them have their plantation within the proximity of the mill (1-3 km). Except for the fact that the farmers have to keep the bunches or split bunches for fermentation, prompt evacuation of the FFB is possible and most of the FFB will get to the mill the same day of harvesting. Even those in the group of 4-6 km (about 20%) will also find it easy to haul the FFB to the mill immediately after harvesting. For these two groups their case is better than some modern/industrial mills who have plantations scattered in the ranges of 20 km or more to the mill. Good examples are the outgrowers schemes practiced by Okomu Oil Palm and Presco (Faborode, 2003). A small percentage of the respondents (2.0, 3.9% and 2%, respectively) have their farms at distances in the range of 7-9 km, 10-12 km and 13-15 km. The farmers affected are in area with little or no infrastructure. In some cases the farmers abandon the mill in their area to patronize a better mill as found in the cases of IOPEC and Umuyota Mills, to mention but a few.

3.10. Age Distribution of Farmers

The age distribution of the farmers is shown in Table 10. It could be observed that a considerable percentage of farmers are in the old age (76%). This calls for making the enterprise attractive so that many youths could participate and hence support sustainability of any interventions to be introduced later.

3.11. Profitability of Oil Palm

Table 11 shows the distribution of other crops grown by the farmers. It could be observed that cassava, yam and maize in that other constitute the leading crops grown by the farmers apart from oil palm. However, about 99% of the famers claimed that they make more profit from oil palm cultivation than other crops

4. Proposed Intervention Plan for Oil palm Production in Abia State

The proposed interventions cut across all the facets of the palm oil extraction industry in Abia State. These include palm fruit production through application of better plantation establishment and management techniques and well organized FFB harvesting and haulage system for prompt processing.

4.1 Improving Oil Palm Production

Improvement of oil palm fruit production will start with usage of improved seeds, fertilizer, better field management and better harvesting techniques.

4.1.1 Improved Seed

Access to improved tenera seeds will increase oil yields per unit area of palms by at least 50% compared to the current practice of collecting seedlings in existing groves. Part of the gain arises from every palm being potentially productive, instead of a proportion being female sterile, and part from the increase in oil yield from the tenera fruit form. Breeders have increased the oil content, with 25% oil on bunch easily achieved from the most recent varieties. Potential bunch yield has been increased as well, which if realised through improved husbandry will raise the oil yield by more than the 50% stated above. The best modern varieties show a reduced rate of vertical growth, which prolongs the life of plantations.

4.1.2 Fertilizer

Large responses to applied potassium chloride have been observed on acid sand soils in Benin, Côte d'Ivoire and Nigeria, with similar soils occurring in Abia (Hartley, 1988). A single application of 9 kg of potassium sulphate to 23 year old palms doubled the yield from about 2.5t ha in two years and trebled it in six years. The yield increase was maintained for at least 13 years. However, later work (Ochis et al., 1991) suggested that it is better to build up the level of soil potassium over a lengthy period.

Preliminary calculations suggest that it will be cost-effective to spend up to $600/ha on fertilizer (7kg/palm) at current prices for palm products, with a cost:benefit ratio of 3:1 with an assumed yield response of 2.5t/ha. The experience is that African farmers require higher cost-benefit ratios from fertilizer use compared to their Asian counterparts, perhaps even more than 3:1 (Yanggen et al., 1998). When this high hurdle is combined with the relatively high price of fertilizer in W Africa, uptake is by no means assured.

4.1.3. Improved Field Management

There is considerable scope for smallholders to improve the performance of their palms without significant cash outlay other than on high quality planting material. There is also scope to improve the efficiency of harvesting and evacuating the fruit from the field, which will entail some investment.

i. Planting

The first step is use of high quality tenera seeds raised in professionally managed nurseries, with thorough culling of sub-standard plants. The difference in nursery management is illustrated Fig. 4. The second step is to ensure that lining is accurate because the yield of oil palms is highly sensitive to deviations from equilateral triangular planting. CIRAD recommend planting their material at 143 palms/ha (9m triangular, 29.53 feet). However, there is no reason to change from the current practice of planting at 29 feet triangular (8.84 m) spacing, which indeed may be preferable because any nutrient stress in smallholder plantings will shorten the fronds, increasing the optimum planting density. The third step is to ensure that the palms are planted at the correct depth, which is the one at which they were growing in the bags in the nursery. The fourth step is to replace any palms that fail to establish properly in the first year.

ii. Upkeep

Palms are sensitive to competition from other plants, both below ground for water and nutrient, where grasses are especially damaging, and above ground for light. It is normal practice with oil palm to maintain a bare circle around the palm, the circle becoming larger as the palm grows, to a maximum of about 5 feet, unless fertilizer is applied, when the circle may be larger. Bare circles make it easier to see loose fruit that have fallen from newly ripe bunches, which are then harvested, and to collect the loose fruit. It is essential to prevent any plants from blocking light from palms, so saplings and creepers must be removed.

In large plantations it is the practice to plant leguminous cover crops such as Puereria phaseoloides, Calopogonium mucunoides and Centrosema pubescens. They both suppress weeds and provide some fixed nitrogen to the young palms. The initial cost incurred in planting them is more than offset by the advantages of reduced weeding costs, improved palm growth and reduced soil erosion. However, use of cover crops is incompatible with the smallholders practice of inter-cropping during the immature period, and we are concerned that any major expansion of oil palm planting should not compromise security of food supplies. In the replanting of community oil palm areas at Mattru, Bonthe District, it has been found that dormant seed of Puereria phaseoloidesI germinated on replanting to provide full cover and so no new sowing of cover crops was needed.

iii. Frond pruning

Frond pruning is another important plantation management practice. Fronds are pruned off for five reasons viz: allow ready access to palms for harvesting, permit visual assessment of fruit ripeness, facilitate harvesting, minimise loss of loose fruit that are retained in the frond bases and reduce epiphyte development and, possibly, disease incidence. West African experience is that fronds should be removed only once they start to senesce, in contrast to Malaysian experience where under more favourable growing conditions it is advantageous to retain only three fronds below the lowest harvestable bunch. The tools used for frond pruning are the same as those used for harvesting – chisels for young palms and sickles for older ones.

iv. Harvesting and transport of fruit

At present all fruit bunches are harvested by men using chisels, necessitating climbing palms once their height exceeds about 1.8m. This is slow, tedious and hazardous, partly because of the risk of falling and partly because of the risk of injury from frond butts. We recommend the introduction of sickle harvesting. Bamboo poles can be used up to 10m and imported aluminium poles up to 15m. Once a significant proportion of palms cannot be harvested with 15m poles it is better to replant them. A transition to sickle harvesting will require investment in both tools and training. The women have the prime responsibility for head loading fruit from the palms to the processing point. We recommend the introduction of wheelbarrows which will greatly improve the efficiency fruit evacuation, especially if the fruit has to be transported further to central collection points.

The benefits of improved agricultural practices on oil yield are independent and cumulative as it can create at least 50% from planting tenera seedlings rather than wild palms, 80-100% by changing from small scale to large scale industrial milling, at least 10% from improved field upkeep and doubling from use of fertilizer. The accumulated gain is about sixfold. Realising the full gain will require investment in improved seedlings, fertilizer, efficient processing and improved field upkeep.

4.2. Possibility of Organised Plantation Production

The possibility of introducing large plantations of oil palms, perhaps as a nucleus estate with mill and associated outgrowers can not be ruled out. Several different actors and interest groups are involved in the establishment of an organised smallholder project and the priorities and perceptions of each of them must be understood and satisfied as far as is possible. The parties involved are (a)the farmers and their families who will be directly involved as participants; (b) the population of the neighbouring area who may benefit, or perhaps lose, as a result of the project; (c) the local authorities – Government, parastatal, private sector, co-operative and political - whose support will be needed for both planning and implementation; (d)the financing institutions - local banks and credit agencies, and any co-financier which might be considered - the security and productive use of whose loans, grants or investments must as far as possible be assured.

The first priority is to understand the current physical and socio-economic situation in the area where a smallholder project has been suggested, and the needs and aspirations of the local population. This requires an appreciation of:

(a) the demographic situation, density and characteristics of the existing population, leadership and skills available, levels and nature of employment or under-employment, range of current income levels, priority needs in terms of food supply, income opportunities and services;
(b) land resources, average and range of holding sizes, land tenure and inheritance

systems, availability of unutilised or under-utilised land;

(c) current land use, productivity levels, constraints on raising productivity and bringing unutilised land into productive use;

(d) additional production and marketing opportunities, farmers' interest in and experience of cash crops suited for the area, constraints encountered in introducing these in the past;

(e) possible competition for land or labour between proposed new activities and existing productive enterprises;

(f) technical, financial, marketing and administrative insti¬tutions servicing smallholder agriculture, their strengths and weaknesses.

The appropriate methods for collecting this information are a combination of quantitative and qualitative ("rapid rural appraisal") techniques. The needs and priorities of the local population cannot be seen in isolation from the national and international economic, administrative and political environment. In determining a response which satisfies the farmers' and local objectives, it is necessary to be sure:

(a) that it does not conflict with the Government's national economic and political priorities;

(b) that the proposed enterprise or enterprises are technically and financially sustainable, and that the necessary funding can be found;

(c) that the institutional and administrative capacity for providing the services needed for project implementation is likely to be available.

Assessment of these questions requires consultation with the relevant technical, financial, administrative and political authorities in the country, prior to full agricultural and financial appraisal (Ellman, 1986).

4.2.1. Possible smallhoders systems

Three broad categories of oil palm smallholder schemes can be envisaged viz: (i) Nucleus estate and smallholders; (ii) Smallholder settlement schemes; and (iii) Small farmer servicing schemes

In the nucleus estate and smallholder scheme, the nucleus estate operates the mill and a plantation which provides a base load for the mill. Usually the mill and estate are a commercial investment with the smallholder component covered by concessionary funds or even grants. There is risk of conflict between the company and the smallholders, due to competition for land, the mill's desire to buy fruit cheap and the smallholders' to sell it dear and poorer services provided by the nucleus estate to its smallholders compared to its employees. Nonetheless, the model has proved to be an effective one in both Indonesia and Papua New Guinea, albeit in a very different social context to Nigeria.

Smallholder settlement schemes are usually established when Governments wish to divide private estates among small scale farmers. Experience is that such schemes are costly with high risk and with a great tendency for farmers' own resources to be under-utilised. Smallholders are likely to become dependent on Government or the project authority and to lose the initiative and incentive to help themselves. It is more cost-effective and simpler to bring production and marketing opportunities to farmers on their own land, than to create these opportunities elsewhere and to move farmers to them. Such schemes have been most successful when farmers have selected themselves – often by squatting.

Small farmer servicing schemes that have brought additional production and marketing opportunities to small farmers on their own land or helped them to raise the productivity of existing enterprises, have by and large proved to be the lowest cost, lowest risk, administratively

simplest, and most easily sustained of the three smallholder models.

The functions which servicing authorities have been most successful in performing have included (i) provision of credit and production inputs; (ii)extension advice supplemented where necessary by on-farm trials; (iii) purchase of farmers' crops and (iv) processing and marketing of the product. These services have been most efficiently provided when the project authority - whether in State, parastatal, private, co-operative or voluntary sector - has enjoyed a degree of managerial and financial autonomy. However the projects have become less replicable, and often less cost-effective, when this autonomy has been achieved by opting out of the public sector altogether, or by setting up a new institution which duplicates or competes with those that already exist. The most cost-effective servicing projects, in national as well as project terms, have been those which have -

(a) worked within national public sector and co-operative institutions, strengthening them as necessary through technical assistance and training, rather than replacing them with separate institutions in the private (or public) sector;
(b) integrated their development programmes with the general agricultural development of the area, rather than focusing only on services for their single cash crop;
(c) encouraged participation by farmers in management and eventual ownership of appropriate components of the servicing institution or institutions (for example a flue-cured tobacco scheme in Malawi)

Private sector organisations have played the most constructive role in such servicing projects where they have identified specific functions which lend themselves to discrete commercial operation such as collecting oil palm fruits, leaving to the public sector the other servicing activities which are already adequately provided for, or whose costs and benefits it is more difficult to assess. Introduction of modern milling practices offers the greatest single potential benefit to existing and prospective smallholder oil palm farmers. The minimum mill capacity is 5t fresh fruit bunches per hour , with an investment of $3m or more required, and ongoing competent engineering and financial management. There are three challenges:

i. Persuading the farmers that it is their interest to sell their fresh fruit bunches to the mills
ii. Ensuring that the farmers and not the mill owners take the added value
iii. Getting the fruit to the mill within 24 hours of harvesting when many feeder roads are frequently impassable and even the major roads are not reliably motorable.

The development of a farmer servicing scheme based on a network of approximately 5t/hour capacity mills positioned through Abia State to minimise fruit transport distances and hence costs is being proposed. In this regards, it is envisaged that the following should take place :

i. Creation of an Abia State Oil Palm Trust
ii. Formation of a not-for-profit State-wide oil palm management company that would be employed by the Trust to operate the mills and provide agreed services to farmers
iii. Grant funding of the establishment of the mills
iv. Ownership of the mills by the farmers who supply the fruit, pro-rata to fruit supplied, but capped at say 2% of the total equity for any individual farmer
v. Matching State investment in main and feeder roads.

It is expected that the mills will have a potential fruit buying price at least 50% higher than in the current market, because of their much greater operating efficiency, even after meeting their

costs and those of the management company. The actual buying price will depend on the cost of the management company, the cost of operating the mills (including depreciation) and the cost of services provided to the farmers.

The services provided by the management company through the mills will include:

i. A mill-membership scheme, giving access to services provided by the mill and allowing sale of fruit. Registration of palms will be part of the procedure. This will provide a database on palm plantings and limit scope for members to sell third party fruit in their own name
ii. Establishment of fruit buying stations where fruit will be graded for freshness, classified as dura and tenera, weighed and priced accordingly. Farmers will be responsible for getting their fruit to the buying point within 12 hours of harvesting
iii. Organisation of fruit transport from fruit buying stations to the mill, preferably in privately owned vehicles, rather than the mills operating their own fleets
iv. A credit scheme, to be based on communities in order to maximise repayment rates. Most likely this will be organised through an existing micro-finance institution, in order to avoid costly duplication of effort. Risk can be reduced but not eliminated by recovery of loans from fruit sales to the mill
v. An input supply scheme related to the credit scheme
vi. Possibly a nursery
vii. Demonstration blocks, probably community based for equality
viii. Development of guidelines for the establishment of community-owned blocks of palms, preferably with a subsidy scheme to cover the establishment and immature period costs
ix. On-farm trials in co-operation with NIFOR, assuming that it isn't cheaper for the mills to go it alone
x. Limited support for the existing extension service, perhaps training of extensionists in oil palm technology and supply of training material
xi. Perhaps, re-inforcement of the extension service by appropriate NGOs. This will become more attractive if the Sustainable Tree Crops Programme successfully adapts the farmer field school concept (which is based on discovery learning) to oil palms.

Conclusion

An assessment of oil palm plantation establishment and management techniques in Abia State was carried out in this study. It was observed that majority of the plantation are small sized and established over twenty years ago with tenera fruit dominating. A substantial part of the plantation also have wild palms. Weeding, fertilizer application and frond pruning are carried out haphazardly resulting in low yield from the plantations. Despite this the famers make more profit on oil palm cultivation more than other crops. A proposed intervention traversing seed procurement to harvesting and haulage of fruit is suggested in order to improve on palm fruit production and utilize the potential of the state in palm oil production, improve on the farmers' income and standard of living and set a path towards returning the Country to the list of palm oil exporters in the World.

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Table 1: Distribution of plantation size (ha)

Size of plantation	Percentage
1-5ha	88.0
6-10ha	6.0
more than 10ha	6.0

Table 2: Mode of Acquisition of land

Type	Percentage
Inheritance	67.3
Purchase	13.5
Lease	3.8
Inheritance and purchase	9.6
Inheritance and lease	2.0
Purchase and lease	3.8

Table 3: Type of Palms Grown

Type	Percentage
Dura	3.8
Tenera	82.7
Dura and Tenera	13.5

Table 4: Distribution of Age of plantation

Age (yrs)	Percentage
1-5	12
6-10	12
>10	76

Table 5: Cost of establishment of plantation (ha)

Farm size	Cost of establishing plantation in '000 Naira				Total
	11 - 20	11 - 20	11 - 20	11 - 20	
1-5	-	-	100	-	100
6-10	-	-	-	100	100
more than 10	-	-	-	100	100

Table 6: Plantation maintenance activities and schedule adopted by farmers (%)

Schedule	Fertilizer application	Weeding	Pruning
Monthly	-	4	23
Bimonthly	-	2	3
Quarterly	10	6	12
Thrice annually	-	4	
Annually	48	44	42
Biannual	42	40	27

Table 7: Cost of maintenance of plantation (ha)

Farm size	Cost of maintaining plantation in '000 Naira					Total
	1- 5	6 - 10	11 - 15	16 - 20	>20	
1-5	6.3	3.1	3.1	12.5	75.0	100
6-10	-	-	-	-	100	100
more than 10	-	-	-	-	100	100

Table 8: Harvesting schedule of palm fruit by the farmers

Schedule	Percentage
Weekly	2
Fortnightly	25
Every three weeks	6
Monthly	59
Bimonthly	6
Quarterly	2

Table 9: Distances of plantations from mill

Distance (km)	Percentage
-3	72.5
4-6	19.6
7-9	2.0
10-12	3.9
13-15	2.0

Table 10: Age distribution of farmers

Age (years)	Percentage
21-40	24
41-60	40
61-80	32
>80	4

Table 11: Distribution of other crops grown by the farmers

Crops	Percentage
Avenger	1.9
Cassava	78.8
Cocoa	11.5
Maize	32.7
Mangoes	1.9
Pears	5.8
Pineapple	11.5
Rice	3.8
Yam	51.9
Cucumber	3.8
Melon	15.4
Orange	1.9
Pepper	1.9
Cocoyam	7.7
Livestock (Goat)	1.9
Okro	3.8
Pawpaw	1.9
Plantain	1.9
Vegetables	9.6
Banana	1.9
Dika nut	1.9
Groundnut	1.9

Fig. 1: Typical palm oil plantation in Abia State showing potassium deficiency symptoms

Fig 2: A young oil palm tree battling with weeds in one of the plantations.

Fig. 3: Immature palms inter-cropped with garden eggs (aubergine, *Solanum melongena*).

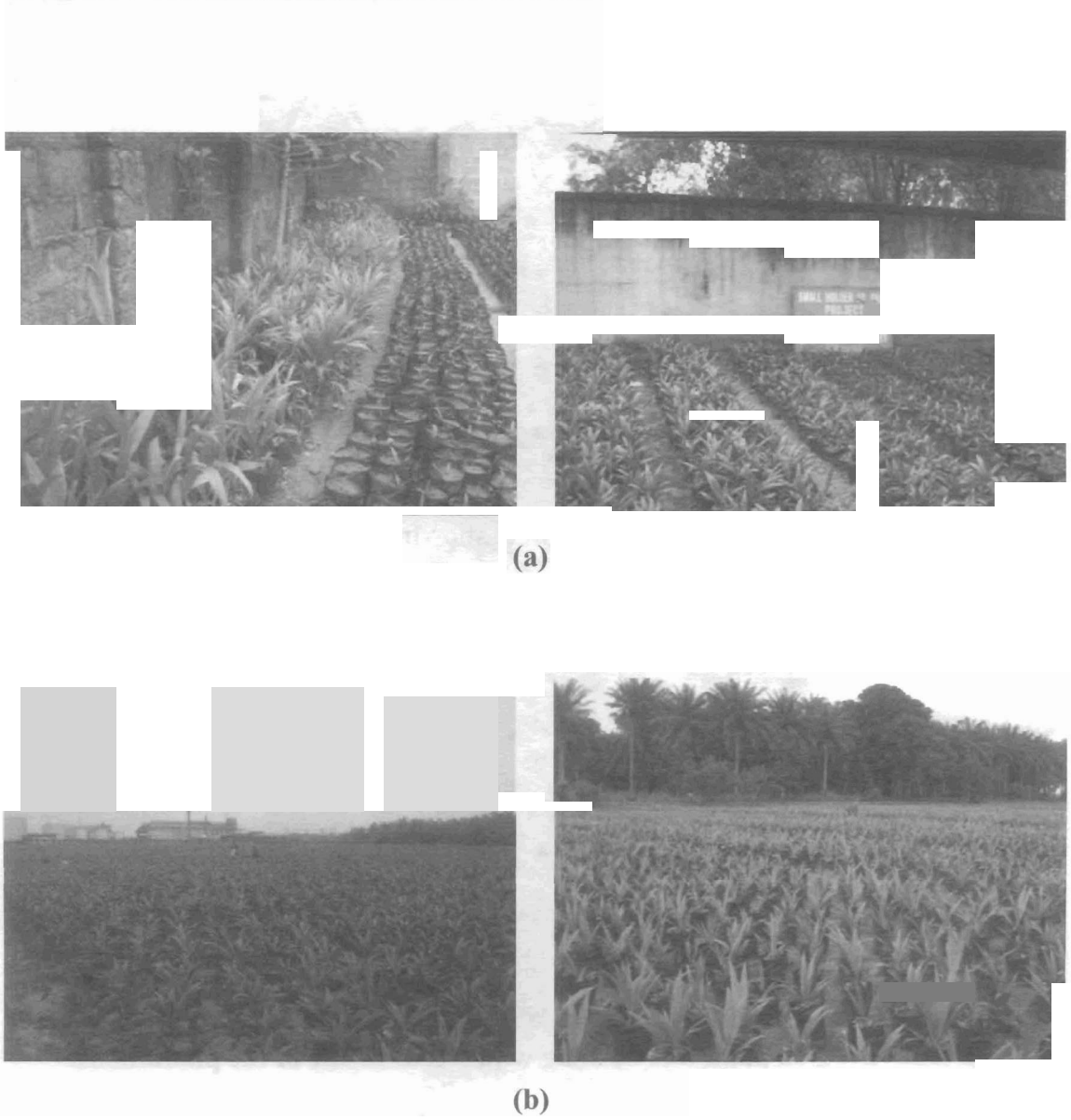

Fig. 4: Current nursery management practice in many parts of Abia State (a); professional /modern nursery practices (b: Presco Nursery (left), NIFOR Nursery (right))