Journal of Applied Sciences

ISSN 1812-5654

science alert

ANSInet
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http://ansinet.com

Journal of Applied Sciences 8 (2): 295-301, 2008
ISSN 1812-5654

Designing Agricultural Development Projects for the Small Scale Farmers: Some Lessons from the World Bank Assistance Small Holder Oil Palm Development Scheme in Nigeria

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Abstract: The study was carried out to investigate farmers reasons for intercropping their oil palm farms with food and other cash crops rather than the sole oil palm planting arrangement specified for participation in the World Bank Assistance Smallholder Oil Palm development project financed during the 1975-83 period. The study was conducted at the Ekuku-Agbor Tree Crop Unit Zone (to the East) and Mosogar Tree Crop Unit Zone (to the Southwest) of the old Bendel State of Nigeria. A total of 35 oil palm farmers were randomly selected from each zone for the study. The study tried to identify the size of oil palm cultivated, types of food and cash crops planted and the proportion consumed and sold and the sufficiency of labour for various farm activities. The study showed that the average oil palm farm size at Ekuku-Agbor zone was smaller (about 1.57 ha) and more fragmented while for Mosogar zone it was 2.28 ha. However a greater percentage (over 65%) of the farms at both locations were within 0.01-2.00 ha farm size range which could be said to be relatively small. The study revealed that among other factors the farmers desire to ensure adequate family food needs which equates to food security and some cash to meet regular family financial needs necessitated their intercropping of the oil palm farms. Others include the need to maximize the returns from the use of labour which they considered a major limiting factor in farm maintenance and to take advantage of the relative high unit price of cassava and its products that prevailed then by cultivating on any available land space including the palm plantations and thereby increasing their farm income.

Key words: Agricultural development projects, small scale farmers, World Bank, small holder, oil palm development scheme, Nigeria

INTRODUCTION

Regardless of the unfortunate past attempts by the Nigerian Government to rehabilitate the oil palm grove, the then Eastern Region government embarked on another rehabilitation scheme during the 1962-19 68 period aimed at replanting 24,000 hectares (60,000 acres) with new hybrid palms. This Oil Palm Rehabilitation Scheme (OPRS) was in fact the major agricultural scheme of the Eastern Nigeria Ministry of Agriculture during the 1962-1968 Development Plan (Purvis, 1958). Based on the experiences from the previous schemes, (the 1928-38 and the 1954-1961 schemes) the government agreed among other things to include fertilizer among the subsidized items and to double the cash subsidy given to the participating farmers from N24.70 to N49.42 ha^{-1} over a 5 year period (Udom, 1984). The disbursement of this subsidy was as follows: N24.71 cash subsidy for clearing during the first year, N4.94 as field maintenance subsidy per hectare for 3 years effective from the 2nd year of establishment and N9.88 cash subsidy for clearing the remaining grove palms (which were thinned to 49 old grove palms per hectare in the first year) during the fifth year. In addition improved oil palm seedlings and fertilizers were distributed to the farmers as subsidies in kind during the first four years, all amounting to N39.53 per hectare (Udom, 1984). Under the scheme also farmers were permitted to intercrop the oil palms with yam, cassava, etc., until the leaf cover of the grove becomes so dense that intercropping was impossible (Purvis, 1970; Udom, 1984).

The ensure success of the new scheme, farmers were made to enter into agreement with the government, binding themselves to follow and comply with instructions and advice of the staff of the Agriculture Development (Udom, 1984). The agreement also made it clear that farmers would forfeit part, or the whole of their outstanding subsidies or would be compelled to pay back part or the whole of the subsidies already received in cases of fire damage and negligence to maintain the new palms adequately.

With the remarkable progress made by the scheme during the first five years of the plan, which resulted in the replanting of 20,223 hectares (49,951 acres), there was

therefore great hope that the 24,000 hectares (60,000 acres) targeted for the scheme would be surpassed before the end of the scheme in 1968 (Purvis, 1970). The scheme in fact surpassed the achievement of the two previous oil palm rehabilitation schemes of 1928-38 and 1954-61 added together by as much as 161%.

Based on the initial success of the program and the enthusiasm shown by farmer-participants, the Eastern Region Government made plans to rehabilitate an additional 133,603 hectares (330,000 acres) of oil palm groves during the 1966/67-1973/74 period (Purvis, 1970). The Food and Agriculture Organization had also endorsed an enlarged oil palm rehabilitation scheme with the suggestion that 117,409 hectares (290,000 acres) be rehabilitated and an additional 24,000 hectares (60,000 acres) new planting by smallholders in Eastern Region (Purvis, 1970). Due to the huge amount of financial resources required for the implementation, the government applied to the World Bank for a loan in 1965. The request was well received although no final decision was taken because of the political disturbances of 1966 which finally resulted in a full-scale civil war in 1967.

After the civil war, the Federal Government made a follow-up request to the World Bank for funds to rehabilitate the country's oil palm industry and this was granted in the early 1970's. By mid 1970's this World Bank credit assistance scheme for oil palm development commenced. Unlike the previous schemes, this scheme focused more on new plantings while the financing was a joint venture between the Federal and the concerned State governments of Nigeria.

Under the credit scheme farmers were provided inputs such as seedlings, protective wire collars and fertilizer free in addition to a cash loan of N300 ha^{-1} for initial plantation up-keep. The latter was a slight deviation from the previous oil palm rehabilitation programmes in the country in which cash subsidy rather than loan was granted to participating farmers. Farmers on their part were required (though no written agreement) to cultivate the improved hybrid tenera palms given to them in sole stands. However, for reasons perhaps due to tradition and/or economic the sole oil palm cropping system was not adopted rather farmers preferred to intercrop their oil palms with food and cash crops such as cassava, melon, maize and yam. After operating the programme for two years (1976 and 1977) the implementing agencies had to abandon the emphasis of sole cropping (though not publicized) as a criteria for participation in the scheme due to the poor response of farmers to the scheme (Table 1). The resultant effect of this policy change from 1978 was a sharp increase in both the number of participating farmers and the size of oil palm land cultivated (Table 1).

Table 1: Level of participation of farmers in the Bendel State small-holder oil palm development scheme*

	Total No. of farmers and hectarage planted annually		Annual land increase		
	----------		----------		Average size percentage of cultivated/farmer
Years	No.	ha	No.	ha	(ha)
1976	133	262.0	-	-	1.97
1977	95	267.0	-28.6	1.90	2.81
1978	192	532.0	102.1	99.30	2.77
1979	185	633.0	-3.6	19.00	3.42
1980	196	860.0	5.9	35.90	4.39
1981	213	816.0	8.7	5.20	3.83
1982	201	854.0	-5.6	4.70	4.25
1983	147	824.0	-26.9	-3.50	5.61
1984	378	489.0	157.1	-40.70	1.29
1985	39380	-89.7	-22.3	9.74	
Total	1779	5917.0			
Annual average	178	591.7	13.3	9.90	4.01±2.37

*: This was only one of the States involved in the programme. Others include Ondo, Imo, Anambra, Cross-River, Rivers, etc. It is also be noted that with the creation of more states in the country, Bendel State has now been split to Delta and Edo States

The questions that this naturally leads to are:

- Why was the sole cropping system initially imposed even though intercropping is recognized as the predominant farming system in the area and was allowed for previous oil palm rehabilitation/ development schemes in the country?
- Secondly, why have the small-holder oil palm farmers tenaciously held to the practice of intercropping in oil palm farms as against sole oil palm cropping system?

For the first question three possible reasons could be advanced. One reason probably stems from the age long belief that intercropping is primitive and common among back-ward and unprogressive farmers (Willey, 1979; Orewa, 1984). Another and probably more likely reason is the attention being paid to yields rather than the smallholder income by development agencies and governments. As Godoy and Bennett (1991) also noted, they find it easier to monitor monocropping than intercropping hence the preference for the former. A third reason emanates from the major failure of Nigerian research scientists to adapt their crop improvement packages into the existing farming systems of the farmers.

In this study attempt has been made to answer the second question on why the small holder farmers resisted the sole oil palm cropping system, by assessing the reasons given by farmers from a farm level survey carried out during the 1981/82 cropping season at some of the initial locations of the project in the then Bendel State. It is to be noted that intercropping of oil palms with cash/food crops still remains the prevalent system used by farmers in establishing their oil palms, hence the relevance of the findings of this study.

The main objective of the study is to identify and evaluate some of the reasons farmers under the project gave for insisting on intercropping food and cash crops in their oil palm plantations, instead of the sole cropping arrangement specified for participation in the project. Specifically the study tried to:

- Identify the intercropping patterns and the number of crops involved.
- Determine the size of farm land cultivated for oil palm by the farmers.
- Identify and evaluate their reasons for intercropping rather than planting the oil palms in sole stands.
- Assess the proportion of the intercrops consumed or sold for cash income.
- Make recommendations on how future projects aimed at bringing about the nations development and the farmers improved welfare in particular, should be designed and implemented.

MATERIALS AND METHODS

The study was conducted at Ekuku-Agbor Tree Crop Unit Zone (to the East) and Mosogar Tree Crop Unit Zone (to the Southwest) of the old Bendel State, Nigeria, between November 1981 and December 1982. The two locations were identified (with the assistance of staffs of the Federal Department of Agriculture and the State Tree Crop Unit) as the initial locations from where the World Bank assisted small holder oil palm development scheme commenced in the State.

The major occupation of the people include farming and trading. The soil in Ekuku-Agbor is well drained sandy-loan and fairly fertile while at Mosogar zone it ranges from well drained sandy-loam and fairly fertile soils to sandy and less fertile soils. The crops grown in Ekuku-Agbor include cassava, yam, melon, okro and coco-yam while in Mosogar the crops grown are cassava, yam and plantain.

As regard the sampling procedure, a random sample of 35 oil palm farmers were selected from each of the two zones from the list of farmers made available by the State Tree Crop Unit of the State Ministry of Agriculture and Natural Resources. Out of this number only the information gathered from 64 farmers (29 from Ekuku-Agbor zone and 35 from Mosogar zone) were found suitable for the analysis. Two locally trained enumerators were employed for each of the two locations (using designed questionnaires) to obtain information from the farmers on their farming activities, including land area cultivated with oil palm and other crops and their reasons for intercropping.

Descriptive statistics such as frequency distribution, means and percentages were used to analyze the socio-economic data collected from the farmers.

RESULTS AND DISCUSSION

One of the hypothesis advanced in this study is that availability of land might be one of the constraints to sole cropping of oil palms at the two locations. This hypothesis is based on an earlier report by Udom (1984) that identify land as one of the factors that hindered the progress of the 1928-1938 oil palm planting and palm grove replanting campaign in Nigeria. The resultant effect was that only a small land area was developed under the scheme but most important was also the fact that oil palm holding per farmer was small (0.76 hectare for newly established plots and 0.38 hectare for replanted oil palm groves) (Anonymous, 1938). So in the first part of this presentation the cropping patterns adopted by farmers in their oil palm plantations are examined as well as the plantation sizes. In the second part farmers reasons for intercropping are listed and analysed.

Cropping patterns in oil palm plantations: The identified planting sequence in the various crop mixtures at the two locations are shown in Table 2. It can be observed from the Table 2 that except for cassava all the other intercrops were cultivated once prior to the first oil palm crop harvest by the fourth year. A probable reason for this is that unlike cassava, yam and maize require higher levels of soil fertility to produce economically harvestable yields. On the other hand the application of fertilizers/ manures to intercrops is not a common practice among farmers in the forest belt of Nigeria rather 3 to 4 years bush fallow system is adopted in maintaining the soil

Table 2: Planting sequence in oil palm plantations at Ekuku-Agbor and Mosogar

		Crop years				
Location	Crops	Initial (Year 0)	1st year	2nd year	3rd year	4th year
Ekuku-Agbor	Oil palm	p	-	-	-	h
	Cassava	p	h	p	h	-
	Oil palm	p	-	-	-	h
	Cassava	p	h	p	h	-
	Yam	p and h	-	-	-	-
	Maize	p and h	-	-	-	-
Mosogar	Oil palm	p	-	-	-	h
	Cassava	p	h	p	h	-
	Yam	p and h	-	-	-	-
	Oil palm	p	-	-	-	h
	Cassava	p	h	p	h	-

-: A times some stands of cassava are left unharvested till the second year after planting (or 4th year of the palm) because they were not fully developed for harvesting or to allow for increased crop yield, p = planting, h = harvesting

fertility. This fact is also supported by Udom's report (1984) on Cross-River State Government Oil Palm Subsidy Scheme of 1971-1974 where he noted that the intercropping of food crops which was encouraged under the scheme later resulted in the practice of bush fallowing system of farming. Thus, with this system of farming it is not possible to have a second crop of yam and maize in oil palm plantations by the fourth year as the massive canopy spread of the oil palm fronds by then would not allow the usual practice of clearing and burning of bushes before the planting of the two crops.

Oil palm farm size distribution: All the 64 farmers interviewed had one and more blocks of oil palm plantation intercropped with food and/or cash crops like cassava, yam and maize (Table 3). At Ekuku-Agbor a farmer on the average had about 3.5 blocks of oil palm plantation with an average farm size of 1.57 hectares. At Mosogar on the other hand a farmer on the average had about 3 blocks of oil palm plantation but with a slightly bigger average farm size (2.28 hectares) as compared to farmers at Ekuku-Agbor.

However, looking at the farm size distribution it can be seen that the bulk of the plantations (over 65%) were between the farm size range of 0.01-2 hectares.

At Ekuku-Agbor about 96% of the farms were within 0.01-2 hectares while at Mosogar about 66% of the farms were also in that range. The Table 3 also shows that at Ekuku-Agbor no plantation exceeded the 3 hectare size whereas at Mosogar about 27% of the farms were over 3 hectares in size. These results tend to suggest that land may be a greater constraint at Ekuku-Agbor than Mosogar as the farm sizes were smaller in the former and more fragmented. In general farm size of about 2 hectares cannot be said to be a large plantation for a perennial tree crop like oil palm because of the large tree spacing arrangement required. For the oil palm, using the regular 27 m (or 29 feet) triangular spacing arrangement only 150 palms can be planted on one hectare of land and for two hectares of land that sums to 300 palms. These small oil palm farm sizes cultivated could possibly suggest some land constraint and hence the need to intercrop the oil palm with other crops. The recognition of this fact is probably why farmers were allowed to intercrop in all the previous oil palm rehabilitation/planting schemes of 1928-1938, 1954-1961, 1962-1968 and even that of 1971-1974. However, the reasons given by the farmers interviewed during this survey are examined.

Reasons given by farmers for intercropping in oil palm plantations: With regard to annual crops, the two commonest reasons that have been cited in the literature for the prevalence of intercropping by small farmers are profit maximization and food security objectives (Norman, 1974; Jodha, 1980; Innis, 1997). For the perennial crops, the reasons range from protective functions to the provision of income and food as well as maximization of returns per unit of resource input (Webster, 1969; Blencowe, 1968; Innis, 1997). Contrary to an apriori expectation only a few farmers (17 and 40% at Ekuku-Agbor and Mosogar, respectively) identified shortage of land as a limiting factor and hence the need for intercropping (Table 4). However, for farmers in Mosogar area, living close to the coastal soils which are mainly sandy soils, it could become a limiting factor in a structural sense and therefore inadequate for oil palm cultivation. A few cases of palms showing symptoms of soil nutrient deficiency was observed in some of the farms at Mosogar tree crop zone probably due to the porous nature of the soils there.

Like every other group of small scale farmers the response to the issue of capital was apriori expected to be the same-that is, lack of capital is greatly responsible for

Table 3: Oil palm farm size distribution (year 1981-1982)

	Location			
	Ekuku-Agbor		Mosogar	
Farm size (hectares)	No. of farms	Relative frequency (%)	No. of farms	Relative frequency (%)
0.01-1.00	48.0	47.06	40.0	36.03
1.00-2.00	50.0	49.02	33.0	29.73
2.00-3.00	4.0	3.92	8.0	7.21
3.01-4.00	-	0.00	20.0	18.02
<4.00	-	0.00	10.0	9.01
Table	102.0	100.00	111.0	100.00
Average No. of farm per farmer	3.5		3.2	
Mean farm size (and SD)	1.57±0.57		2.28±1.40	

Table 4: Reasons given by farmers for intercropping in oil palm plantations (year 1981-1982)

Reasons for growing other crops in mixtures with oil palms	Farmers (%) Ekuku-Agbor (n = 29)	Mosogar (n = 35)
Difficulty in getting labour to weed	75.9	80.0
High Labor wage rates	93.1	97.0
To be able to maintain the plantation	89.6	80.0
To provide some alternative source of income	96.5	91.4
To be able to pay for the cost of maintaining the plantation	51.7	75.9
Lack of capital	100.0	100.0
Because of the existing high market prices of some of the intercrops grown	82.7	48.6
To reduce labour use	20.7	31.4
To meet some basic food needs of the family	96.5	94.3
To make better use of the land in-between the palms	93.1	85.7
Because of shortage of land	17.2	40.1

their desire to intercrop (Table 4 Question 6). While one might admit that the cash loan advances given to the small-holder oil palm farmers then (N300 ha^{-1}) and free inputs such as fertilizer, oil palm seedlings, protective wire collars might not have been adequate, studies else where in Nigeria have shown that cash loan advances to farmers are often not fully used for farm related inputs or activities rather they are used on non-farm inputs like acquiring more wives, construction of residential buildings, purchase of food and clothing and others including religious and social purpose (Johnson, 1966; Ebhohimen, 2007). Capital in the form of cash may become relevant when reference is made to the hiring of labour and purchase of farm related inputs. It may also be relevant in terms of their future ability to repay the loan approved for their oil palm establishment.

Table 4 also shows that over 93% of the farmers complained of the prevailing high farm labour wage rates as partly responsible for their desire to intercrop in oil palm plantations. This same complaint was made by farmers during the 1962-68 oil palm grove rehabilitation scheme (Eicher and Miller, 1963; Purvis, 1958). This situation led many farmers then to abandon the maintenance of their planting rides and the ring weeding of the palms. This state of affair prompted the Ministry of Agriculture to suggest an upward review of the cash subsidy granted to the farmers from N49.42 to N66.72 ha^{-1} (Udom, 1984). The FAO (1966) even recommended a higher cash subsidy of N74.13 ha^{-1}. The need to effect this upward review was also why the Eastern Nigeria Government then applied to the World Bank for a loan in 1965.

Usually high farm labour wage rates could be the result of one or more factors-relative labour scarcity, unionized labour wage rate fixing, increased demand for labour in non-farm sector and government fixing of some minimum wage rates for labour. With respect to the latter it was not too relevant when this study was carried out (1981-1982) as this is only a recent development in Nigeria. At the farm level, union labour activities was non-existent though farm labour wage rate fluctuated between N5 and N6 per worker per day in the area then (1981-1982 period). Therefore it is probably safe to say that the most likely reason for the high wage rates experienced in the farm sector then was as a result of a relative labour scarcity brought about partly by the changing structure of the Nigerian economy and partly the result of increased demand for labour relative to the available supply during annual cropping season. This reasoning can be justified by the fact that over 75% of the farmers interviewed indicated the difficulty of getting labor for weeding the plantations as being partly responsible for their intercropping. The responses to questions (1) (3) and (5) in Table 4 also suggest some difficulty of getting sufficient labour for field maintenance and the financing of jobs done. Faulkner (1926) from his earlier experiences with smallholder oil palm development in Nigeria noted that there is greater chance of the people clearing and weeding the oil palm land effectively if they are allowed to grow food crops along with the palms. Anonymous (1920) also noted that apart from the revenue earned from intercrops during the oil palm gestation period, the soils are improved by the cultivation whilst weeds are also kept down. Both views highlight the advantages of intercropping oil palms as against the sole cropping advocated by the scheme.

Intercropping as opposed to sole cropping is recognized by the farmers as more labour intensive. This is evident from the response to question (8) in Table 4. The few who said it reduces labour use are probably those who view it in its totality as opposed to the application of labour to individual crops on separate plots (in sole cropping). The other group are probably those farmers who abandon their farms soon after planting or after the first weeding but only to return to the farms at harvest time.

Though the response to question (7) tend to be uneven between the farmers at the two locations, the results suggest that among other factors, price consideration plays a key role in farmers decision to plant a particular crop as well as the proportion and pattern of cropping to adopt. As was observed during the survey more farms were cultivated with more cassava relative to yam because the farmers claimed that cassava is less labour intensive in addition to the fact that the price of garri (one of the products from Cassava) at that time, was comparably higher. This reasoning can be articulated with the need to maximize profit by maximizing the returns from the most limiting factor-in this case labour. It can also be linked with the fact that the farmer as an economic man must seek for some alternative sources of income during the initial years when there are no crop harvest from the perennial crop (i.e., the oil palm).

With over 91% of the farmers indicating the need for some alternative sources of income and food for the family (as reflected in the response to questions (4) and (9) in Table 4, highlights the fact that, apart from the social obligations the farmer has to regularly fulfill, food security is also another factor that induces farmers to intercrop in their immature oil palm plantations. The percentage of produce sold out from their annual harvest (Table 5) also tend to support this view. With a food reserve of 30-50% of the annual crop harvest withdrawn for family consumption suggests also that food security goal is partly responsible for the practice of intercropping in oil palm plantations.

Table 5: Percentage of intercrops sold or consumed by the farmers

Location	Crops	% of farmers who sold their intercrops	% of produce sold out	% of produce consumed
Ekuku-Agbor	Cassava	100	70	30
	Yam	100	50	50
	Maize	100	60	40
Mosogar	Cassava	100	65	35
	Yam	60	60	40

CONCLUSIONS

This study has attempted to identify some of the reasons why the farmers under the World Bank assistance smallholder oil palm development scheme (introduced in 1976 in Nigeria) insisted on intercropping their oil palms with food and cash crops in place of the sole oil palm cropping pattern recommended for participants under the project. The reasons given by the farmers for intercropping can be classified into three categories. The first was the need to maximize the returns from the use of labour which they considered a major limiting factor in crop production. This they believe can be achieved through a multiple crop cultivation approach.

The second is the need to meet their family food needs a strategy that can be equated to food security. This again they try to achieve by ensuring that what ever labour and space were available were utilized in the production of food crops in addition to cash crops, the latter they require to sustain production and meet other family financial needs.

The third factor is consideration of the relative crop prices. With the relative rise in the domestic price of cassava and garri (the processed form) at that time, farmers responded by shifting more land to cassava cultivation thereby increasing the volume of cassava available for sale and therefore increase in their farm income. The response to that price incentive probably led to the intensification of intercropping and in particular cassava cultivation with young oil palms. This desire can be articulated with the need to make profit and therefore increased income and welfare.

This study particularly noted that none of the farmers mentioned or knew much about the agronomic benefits of their intercropping activities. A number of studies have shown that apart from being profitable for smallholders, intercropping improves soil fertility, water retention and soil temperature, controls pests and diseases, enhance agricultural productivity and discourages herbivore build-ups (Innis, 1997).

These research again suggest that efforts to bring about change or development by the researchers, policy makers or extension agents should start where the people are. Change or development agents should start at the level where the people are. That is at their level of knowledge, understanding, interest, need and degree of readiness in order to achieve the desired level of change. This view is also emphasized by Thanee (1992) in his article titled Farmer as Scientist: Bringing the Farmer's knowledge to Research. Based on his findings from on an unusual mixed cropping system's research involving onions, peppers, peanut, mung beans and maize by farmers in North East Thailand, he concluded by saying researchers in this area need to recognize that their role includes learning from farmers, as well as instructing them. Thanee (1992) recognized both the value of farmer knowledge of such practices and the need to learn from them.

The farmer being an economic man must evidently respond to some price incentives and at that time they responded to the rising price of cassava and cassava products by putting any available land into the cultivation of cassava while at the same time taking advantage of the free inputs and cash loan advanced for oil palm cultivation provided by the World Bank Assistance Small-holder Oil Palm Development Project.

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