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SOCIO-ECONOMIC ASPECTS OF THE INTENSIVE GROWING OF COWPEAS (VIGNA UNGUICULATA (L.) WALP.) IN KANO, NORTHERN NIGERIA.

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SUMMARY

The costs and benefits of single crop cowpea and cowpea grown in a traditional mixed cropping system are calculated for the Kano area, in northern Nigeria. If all the technical requirements are met, single crop cowpea is more profitable, on a financial return per unit land basis, than the traditional crop mixture. A one year effort to try and familiarize traditional farmers with a new variety and new production methods is clearly not enough and may even demotivate a number of farmers when the yields, and financial returns, are low. To ensure that the improved technologies are adopted, it will be necessary to provide a credit programme enabling farmers to purchase the improved inputs, and a marketing structure that guarantees fixed and stable market prices throughout the year.

KEYWORDS: Vigna unguiculata, cowpea, northern Nigeria, financial analysis, marketing

1.Introduction

In a previous article the technical aspects of the intensive growing of cowpea (Vigna unguiculata (L.) Walp.) have been treated. The present article describes some socio-economic aspects of the so-called cowpea packet (Sampers, et al., 1986).

The first part compares the labour input and profit margins for single crop cowpea production methods with the traditional cropping methods of producing cowpea in mixed cropping. The second part examines the adoption of the cowpea packet by the farmer and the consumer. A third part describes some general aspects of the cowpea marketing system in Nigeria.

All data were collected through a survey conducted by one of the authors from August till November 1983 in co-operation with the KNARDA (KaNo Agricultural and Rural Development Authority; see Sampers, et al., 1986).

2.Profit margins for the intensive growing of cowpea

2.1.Labour input per activity

The concept of labour is difficult to define.

In many rural areas, it is possible to make a distinction between necessary labour and productive labour.

Necessary labour consists of such activities as going to the field, preparing pesticide solutions and repairing tools. Necessary labour is needed to ensure a certain output, but there is no functional relation between output and labour. This relation does exist, however, between productive labour and output, and is governed by the law of diminishing returns. This means, for instance, that if a given land area is combined with constant additions of labour using simple tools to produce a certain commodity, the output will initially increase, but as more and more labour is added, the

average output per man-hour declines as also do marginal additions to total product. This results in "surplus" labour (Todaro, 1982).

In this study we are especially interested in a calculation of profit margins, therefore only the productive labour will be considered. One must bear in mind, though, that the necessary labour takes up a lot of time due to the lack of transport means.

It is also difficult to find a good unit by which to express labour. Many authors use man-days, others use man-hours. To be able to compare the results obtained in different studies, man-days must be clearly defined, as the hours per man-day in tropical farming may vary between 2 and 10. The use of the man-hour concept may therefore proof better as it is a smaller unit. It does not say anything, however, about the efficiency of the farmer considered. In general, the amount of work individuals will undertake is determined by many factors such as health, nutrition, climate, size of family and farm, subsistence needs, incentives, presence and accessibility of markets, attitude and educational level, off-farm employment opportunities, etc.

In this study, the unit of labour used will be the man-day. One man-day is defined as 5 hours productive labour. In the surveyed area, farmers work on the field from 8 a.m. till 1.30 p.m. (when Muslim people have to pray for the second time). This means 5.30 hours of labour, of which 5 hours is considered to be productive. This figure compares closely with those obtained by other researchers in West Africa, e.g., Luning (1964), Norman (1973) and Norman et al. (1979).

The relative efficiency of men, women and children was calculated by Norman (1973) and Knipscheer, et al.(1980). The man-day equivalent factors are:
1 for a male adult
0.75 for a female adult
0.50 for a child up to 15 years.
Women have a secondary role in the production process of the intensively grown cowpea as the project only works with

men. The only activity performed by women in the cowpea packet is threshing. This can be related to the traditional work division in the Hausa communities which is based on the practice of the partial or complete seclusion of Muslim women (Smith, 1955).

Data on the labour input by activity (table 1) were gathered from a survey of 12 farmers who had finished harvesting.

Table 1: Labour input by activity in intensively grown cowpea (man-days/ha)

ACTIVITY		TOTAL LABOUR INPUT Man-days/ha	%
Hand broadcasting of fertilizers		0.3	0.2
Land preparation using animal traction		2	1.4
Sowing by hand		5	3.6
with the sowing machine		1 x	
Thinning		1	0.7
Weeding	(2*33.2)	66.4	47.7
Spraying (3 sprayings)	(3* 0.5)	1.5	1.1
Harvesting		58.3	41.9
Threshing		4.8	3.4
TOTAL		139.3	100.0

x Sowing with the sowing machine was not used for calculating the total, because the purchase of this device is too expensive for the average farmer.

Seventy-four percent of the farmers who have been approached by the cowpea packet claim that in future they will prepare their land using animal traction. This explains why only land preparation with oxen has been taken into consideration in table 1. The number of weedings has been established at two. This lies between the three passages advised by the project and the one passage done by most of the farmers. Data on labour input for taking home and

storing the cowpea haulm are not taken into account, because T.V.X.-3,236 produces only a small quantity of poor quality haulm.

In total, 139.3 man-days were used to grow 1 hectare of single crop cowpea with the proposed cowpea packet methods. Of this total, 63 % (88.2 man-days) came from family sources and 37 % (51.1 man-days) from hired labour.

89.6 percent of the labour input is needed for weeding and harvesting. On these peak moments, demand for labour is high. Weeding cowpea coincides with the harvest of early millet. Harvesting cowpea takes place in the same period as the harvest of the newly introduced sorghum variety, which is mature before the traditional varieties. On the other hand, land preparation and sowing are done in a period in which the demand for labour is small: the weeding of grain crops is almost finished at this moment.

Fifty-eight percent of the labour input used in harvesting comes from hired labour, against 40 % of the labour used in weeding. As it is, farmers judge they can postpone weeding, or can spread it over a longer period, and so they will not go and hire labour for this activity.

The marked seasonal peak demands for labour which in traditional cowpea growing coincide with planting and harvesting, have shifted with the cowpea packet approach. Animal traction enables farmers to plough more land in less time hereby reducing the time spent on land preparation. The first peak now lies with the weeding activities, or should lie with them because, as discussed before, weeding is not very popular among farmers.

2.2. Profit margins of the intensive growing of single crop cowpea

For the calculation of the costs, the production scheme from the project was followed. Land preparation with a tractor costs 30 Naira (1) per hectare (15 Naira for

Table 2 : Cost and returns of growing 1 ha of single crop cowpea according to the cowpea packet for the reference year 1983 (1 Naira = 1.30 U.S. $)

GROSS RETURNS			
Yield of cowpea (kg dry beans/ha)	695		
Value of cowpea (Naira/ha)		636.72	(1)
INPUTS (Naira/ha)			
Land preparation		30.00	
Labour (2)			
family labour		264.60	
hired labour		153.30	
total		417.90	
Others			
seed (10 kg)		12.50	
seed-dressing		0.75	
fertilizers (200 kg NPK 15-15-15)		11.28	(3)
insecticides (3 x 0.5 l Cymbush E.D.)		40.50	
depreciation of E.D.-sprayer		15.00	(4)
batteries		2.00	
COSTS (Naira/ha)			
Total (including only hired labour costs)		265.33	
Total (including all labour costs)		529.93	

NET RETURN COSTING ONLY HIRED LABOUR
= 636.72 - 265.33 = 371.39 Naira/ha

NET RETURN COSTING ALL LABOUR
= 636.72 - 529.93 = 106.79 Naira/ha

VALUE OF FAMILY LABOUR

$$= \frac{371.39 \text{ Naira/ha}}{88.2 \text{ man-days/ha}} = 4.20 \text{ Naira/man-day}$$

YIELD (kg/ha), NECESSARY TO COVER COSTS	
including only hired labour	288.40
including all labour	576.00

(1) The average farm gate price at harvest time (October-November) is 2.30 Naira per mudu T.V.X.-3,236. A mudu is

the local trade unit and contains 2.5 kg. This gives a mean price of 0.92 Naira/kg T.V.X.-3,236.

(2) The average wages are 3 Naira/man-day.

(3) 50 kg N.P.K.(15-15-15) cost 2.82 Naira. Fertilizer prices are subsidised for 50% by the Federal Government.

(4) An Electro Dyn-sprayer costs 75 Naira. With a linear depreciation over five years, the yearly cost amounts to 15 Naira.

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harrowing, 15 Naira for making ridges). Hiring a couple of oxen from other farmers costs 10 Naira per plot. The mean plot size in the survey is 0.31 hectare, which gives a cost of approximately 30 Naira/ha. Thus, there is no difference between the costs of land preparation with a tractor or with animal traction.

Net returns are usually defined as gross returns minus costs. Net returns, however, are difficult to calculate in those circumstances where the opportunity cost for land is difficult to establish and where a lot of the productive labour is performed by family members. Net returns have therefore been calculated in two different ways, according to the manner in which labour costs are considered (table 2).

In a first method the net return is calculated assuming that hired and family labour are nearly perfect substitutes. This is especially true in the two periods where the demand for labour is high: weeding and harvesting make up 90 % of all labour performed on the cowpea crop. Thus, in this first method, family labour is valued at 3 Naira/man-day, resulting in a net return of 106.79 Naira/ha.

The second method, in which only hired labour is considered, gives a net return of 371.39 Naira/hectare, resulting in a compensation for family labour valued at 4.2 Naira/man-day.

2.3. Profit margins of a traditional crop mixture based on sorghum, early millet and cowpea

Table 3:Costs and returns in a sorghum-early millet-cowpea crop mixture for the reference year 1982 (1 Naira = 1.30 US $)

GROSS RETURNS (1)		
Grain and beans		
Yield of sorghum (kg/ha)	731	
Value of sorghum (Naira/ha)		292.40
Yield of early millet (kg/ha)	819	
Value of early millet (Naira/ha)		343.98
Yield of cowpea (kg/ha)	149	
Value of cowpea (Naira/ha)		140.06
		776.44
Hay		
sorghum (360 kg at 0.1 Naira/kg)		36
early millet (260 kg at 0.15 Naira/kg)		39
cowpea (200 kg at 0.25 Naira/kg)		50
		125
TOTAL RETURNS		901.44
INPUTS (Naira/ha)		
Land preparation		30.00
Labour (2)		423.60
Seed (3)		
sorghum		1.75
early millet		1.60
cowpea		5.70
TOTAL COSTS		462.65

NET RETURNS COSTING ALL LABOUR (without hay)
= 776.44 - 462.65 = 313.79
NET RETURNS COSTING ALL LABOUR (with hay)
= 901.44 - 462.65 = 438.79

(1) Yields obtained from the FRADYS-survey (Sampers, et al.,1986). Values are average off farm prices for the October-December period for early millet (0.42 Naira/kg)

and cowpea (0.94 Naira/kg) and for the November-December period for sorghum (0.40 Naira/kg).

(2) 141.20 man-days at 3 Naira/man-day.

(3) For sorghum 2.19 mudu seed/ha at 0.80 Naira/mudu (June), for early millet 1.77 mudu at 0.90 Naira/mudu and for cowpea 2 mudu at 2.85 Naira/mudu. The seeds are taken from the farmers' surplus of the previous season, or bought on the local market.

The FRADYS-survey from 1982 shows that sorghum-early millet-cowpea is the most frequent crop mixture (16 % of the plots).

In this paragraph an estimation of the profit margins of 1 hectare under this mixed cropping system will be made.

From the same survey we can see that only 17 % of the farmers apply inorganic fertilizers. No farmer uses insecticides. Therefore, neither fertilizers, nor insecticides are included in the cost calculation for the traditional mixed cropping.

The labour input for growing sorghum and millet in a mixed cropping system with three crops is deduced from Knipscheer, et al. (1980; data were collected in Kano State). The additional data about the labour inputs to grow cowpea in a mixed cropping system with three crops were deduced from a survey conducted by one of the authors. The total labour input for 1 hectare of sorghum-early millet-cowpea is 141.2 man-days, of which 10 days are needed to collect the hay.

It is interesting to mention that the hay trade has become more and more important during recent years. Exact data on the productions per hectare, however, are not available. Estimates of hay yields in a crop mixture are based on figures from Hendy (1977): 260 kg/ha dry millet stalks, 360 kg/ha sorghum stalks and 200 kg/ha cowpea haulm per hectare. Prices for 1 kg hay from millet, sorghum and cowpea shortly after the rainy season are 0.15, 0.10 and 0.25 Naira,

Weeding in a millet field

respectively. One surveyed farmer claimed that the hay from a hectare with a mixture of millet, sorghum and groundnuts could earn him between 40 and 50 Naira for the millet stalks, between 30 and 40 Naira for sorghum and up to 120 Naira for the hay of groundnuts. This shows that the estimates that are made are reliable.

It is remarkable that hollow millet stalks are more expensive than the filled and more nutritive sorghum stalks. Farmers pay more for the hollow millet stalks as they think that cattle prefer millet stalks to sorghum stalks, because people also prefer millet.

2.4.Single crop cowpea versus traditional crop mixtures

It is rather difficult to compare the net returns of tables 2 and 3 because the data on which they are based were obtained in 2 succeeding years which had different weather conditions.

1983 was a very dry year. No sorghum was harvested in 1983. Yield data on early millet and cowpea grown in mixture for 1983 are not available because the FRADYS-survey was concluded in 1982. The rather dry rainy season together with a non respect of the planting date for cowpea and poor spraying resulted in an average yield of 695 kg/ha of dry cowpea beans on the project's monitored fields. This is only a third of the 1,958 kg/ha obtained in a field trial in 1982. This last figure is an indication of the potential yields that can be obtained in normal ecological conditions using optimal farming procedures.

Results obtained in similar ecological circumstances (Hays and Raheja,1977) seem to indicate that yields of over 1,000 kg dry cowpea beans/ha under single cropping are reasonable. The same authors concluded that under the given circumstances the sole crop cowpea was more profitable than any other competitive crop enterprise.

If we cancel, in table 3, the returns obtained through sorghum (no yield obtained in 1983) and consider all other factors equal, then the net return costing all labour (without hay) drops to 21.39 Naira/ha. It is not unreasonable to assume that cowpea and early millet yields in 1983 were lower than the figures represented in table 3, hereby further reducing the net returns and resulting in a lower remuneration of the family labour component. This reasoning seems to indicate that the single crop cowpea studied here was and, in general, is more profitable than the traditional mixed cropping system. Adding the hay component gives a slightly better result for the traditional mixed cropping, assuming equal millet and cowpea yields, but with lower yields for those two crops the net return would be lower again.

The single crop cowpea and traditional cowpea growing methods have been compared on a purely financial basis. It is, however, necessary to bear in mind that the traditional system is not very market oriented.

Table 4: Destination of harvested dry cowpea beans (number of farmers)

DESTINATION OF HARVEST	VILLAGE				TOTAL
	DAMBATTA	KADANDANI	AJUMAWA	MAKODA	
Partly sowing seed, the rest sold	5	4	2	3	14
Autoconsumption	1	2	2	2	7
Sold on the market	2	0	1	3	6
Partly sowing seed, partly autoconsumption, rest sold	1	1	0	0	2

Millet and sorghum are food crops grown for autoconsumption. The grains are used in local dishes, or to

brew bear. The hay is used as fodder for the cattle. Sorghum and millet stalks are also used to repaire the roof, to make fences or as a fuel. Only surpluses are sold. Cowpea, however, is a cash crop. The dry beans are sold as quickly as possible after harvesting (table 4). By growing nothing but cowpea the farmers loose some of the by-products (haulm) and become more dependent upon ecological conditions and market prices for food products.

3.Adoption of the cowpea packet by the farmers

When asked about their attitudes towards the newly introduced variety, it was clear that, for the year to come, no farmer would grow anything but the new cowpea variety. Eighty-six percent of the farmers will grow T.V.X.-3,236 as well as traditional varieties. Eleven percent of the farmers will only grow traditional varieties. The others had not made any decision yet.
The arguments in favour of T.V.X.-3,236 are (in decreasing order of importance):
- it is a market oriented variety
- it gives a good yield (as experienced on their own fields)
- it can be sold as seed for planting
- it can give a good yield (as seen on demonstration plots)
- a good yield is possible once the cultural methods have been mastered.

The arguments in favour of the traditional varieties are:
- they produce a lot of haulm
- they can be used for autoconsumption
- the traditional varieties can still yield something when the new variety fails.

The farmers who do not want to grow T.V.X.-3,236 anymore argue that:
- T.V.X.-3,236 is not accepted by the consumer
- the project takes up too much of their time with visits, questions and advice.

Amongst the farmers who will continue to grow T.V.X.-3,236,

60 % will increase the plot size used, 24 % will decrease the size, whilst the others (16 %) will maintain this size. No farmer will grow T.V.X.3.236 in a crop mixture. For those who will increase the surface area grown with the new variety, the reasons are:
- the good yield
- the good price
- the necessity for them to earn more money
- that it is a source for personal consumption
- the greater possibilities to sell it instead of groundnuts.

As it is, the project authority has no built-in marketing function. This lack might demotivate some of the farmers in the long run. Some of the farmers think the project authority should buy the dry bean production at a fixed price, thus guaranteeing their income. Should the project fail to do so, then they will not cultivate larger surfaces. Reasons to actually decrease the plot size are:
- the yields are too uncertain
- the beans can not be sold on the market (see further)
- cowpea is not a basic food crop, and the cash earnings are too high.

The last two reasons clearly indicate that the project should assist the farmer in selling his marketable surplus. The last point also illustrates that at least some of the farmers are not very market oriented: they do not want to grow cowpea because it is a cash crop. The money they earn by selling their harvests may even create (social) problems, as they are not used to save money or to invest it. In traditional families surpluses are allocated within the family group according to everybody's needs. Each member can hereby decide what to do with surpluses. Reallocating money derived from the selling of surpluses has proved more difficult. When the head of the family spends it he will be criticized by the other members of the group because the different generations have different ideas about how money should be spent (Counet, et al., 1985; S.E.D.E.S., 1976).

4.Input costs and available money

The survey also tried to obtain information about the input costs, and the availability of cash in the beginning of the rainy season, when farmers have no income from marketing activities, but need money to buy inputs. In 1983, the projected input costs for the farmers co-operating with the project amounted to a mere 27.6 Naira. For the proposed 0.5 ha (1 acre) they had to pay 6 Naira for the seed, 20.25 Naira for insecticides, 1 Naira for the batteries and 0.35 for the seed dressing. From the following year onwards the farmers had to buy their inputs and production factors themselves. Fertilizers and pesticides were available at the KASCO-stores (Kano Agricultural Supply COmpany Ltd.) at market prices. The Electro-Dyn sprayers which were used in 1983, and which are property of the project, were sold at a second hand price of 50 Naira. This was also the case for the planting machines which were sold for 180 Naira. A new planter costs 240 Naira.

The input costs in the beginning of the rainy season are estimated at 52 Naira/acre. These costs include land preparation, seed and seed dressing, fertilizers, insecticides.

Twenty-nine farmers, who had been co-operating with the project, were asked if they would be able to pay this sum in the beginning of the rainy season. All of them said they would. For 3 farmers, even the purchase of a planter would be no problem. Amongst the 29 farmers, 4 were not sure that they would also be able to buy an Electro-Dyn sprayer. This can be further proof that only the richest farmers were selected to co-operate with the project. In traditional African societies, however, it is a common practice that projects address themselves to the people who have a certain prestige.

In a group of 33 persons who are full time farmers and who had not co-operated with the project, only 5 claimed that they would be able to pay the 52 Naira input costs and that they would also buy the E.D.sprayer. Twelve farmers thought they would not be able to grow one acre of cowpea due to

the high input costs. The other 16 farmers could pay 52 Naira at the beginning of the rainy season, without, however, being able to buy an E.D.-sprayer. It is clear that the input costs are too high for the average farmer.

5.The consumer's attitude towards T.V.X.-3,236

The promotion of T.V.X.-3,236 was clearly intended to try and give the farmer a cash crop he can sell on the market. It is, therefore, interesting to see what the consumer's attitude towards cowpea beans is.

The population of northern Nigeria prefers middle-sized cowpea beans of a white colour. The beans of T.V.X.-3,236, however, are very small and brownish, which is a negative element in the acceptance of the new variety by the consumer.

No farmer who grows this new variety has any objection against the size and the colour of the beans. They "have to accept something which is grown on their land with the help from Allah..."

The new variety has a sweet taste, which is accepted by the local people. The cooking properties are very good: it takes less time, and firewood, to cook a given quantity when compared with traditional varieties. This is not unimportant in an area where firewood has become scarce and expensive. It will take some time, however, before people will be aware of the wood saving properties in preparing T.V.X.-3,236, and the question remains whether this positive property will offset the more negative ones.

The small amount of T.V.X.-3,236 beans does not influence the local cowpea price. As it is, the new variety's price is set below the traditional cowpea's price, in an effort from the producers to sell their production. Even then the consumers prefer the traditional varieties, because:
- the new beans are too small
- their colour is new, unknown

- their taste is unknown
- their preparation could cause some problems
- the small amount marketed makes the consumers distrustful.

Traders do not buy the new variety either, because the amounts supplied are too small to enable them to make large trade units (bags of 100 kg). On the other hand, they are also afraid that they will not be able to sell T.V.X.-3,236 in other towns where this variety is completely unknown.

In the end, there are only a small number of people buying T.V.X.3,236. They will use the beans as planting seed, or prepare a kind of cake with it "so that their family can not see the original colour or size of the beans".

There exists a second improved variety, I.T.A.-60, which produces large white beans. It is only grown on a small scale, though, but has no difficulty to be accepted by the consumer.

6.The cowpea marketing system in Nigeria

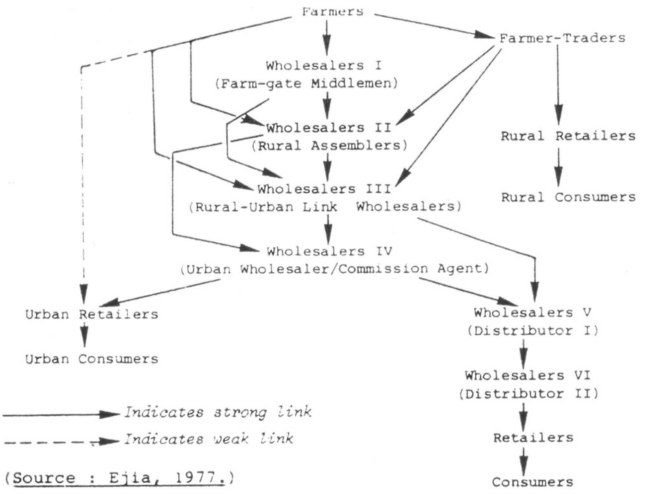
As the cowpea packet tried to make the traditional farmers more market oriented, it is interesting to see how the cowpea market is organized, and how prices fluctuate throughout the year.

At the begin of the marketing channel, there are the cowpea producers, who are especially located in northern Nigeria. On the other end, there are the consumers in deficit areas, especially in southern Nigeria.

Figure 1 gives the different marketing channels of cowpea in Nigeria.

There are two types of cowpea farmers. The first group consists of small farmers who sell their surpluses to local purchasers, to farmer-traders, or directly to the consumer on smaller markets. They almost never sell to urban retailers

Figure 1 : The organization of the cowpea marketing system in Nigeria



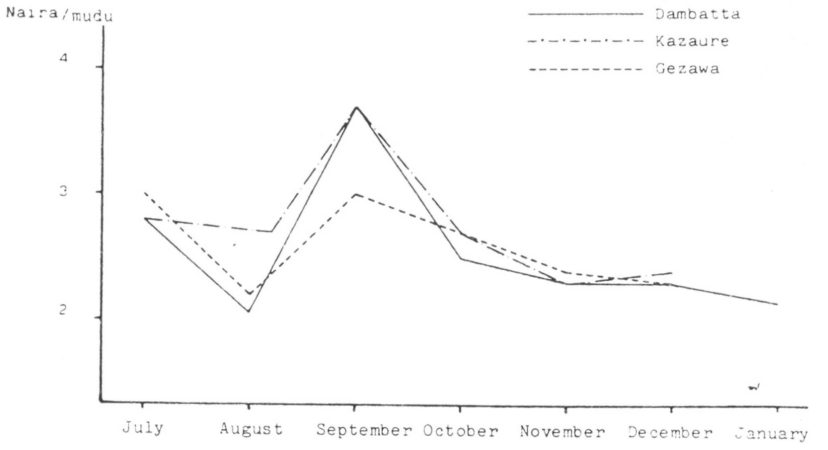
(Source : Ejia, 1977.)

(weak link in figure 1). The second group consists of richer farmers who buy cowpea when it is harvested. These farmer-traders speculate on short term price fluctuations, or on the price differences between different nearby markets.

The local purchasers go and buy the cowpea surpluses at the farmers' (Ejiga, 1977). In some instances the farmers go to these small purchasers and sell them their surplus on a local market. In this case, the difference between the local purchaser and the farm-gate middleman (wholesaler I) is difficult to make.

The different types of wholesalers establish a link between the rural and the urban markets. Commission agents have a good knowledge of the price fluctuations and the market situation. The distributors link the urban markets together.

Figure 2 : Price evolution of cowpea beans from July 1983 until January 1984



It will depend upon local circumstances whether all the levels in the cowpea marketing scheme will be present. In some instances,different functions will be concentrated in one person. It might be possible, for instance, that a successful farmer becomes a farmer-trader and, after some time, also a rural assembler. Later on, he could go to a nearby town

with his product , in this way becoming a rural-urban link wholesaler. A further evolution along the line (thus becoming an urban wholesaler or a commission agent) would be more difficult, as this would imply that he should go and live in town, which would result in a complete change of life style and habits.

At different levels in the chain cowpea beans are stored before they are sold. This, together with the large number of intermediaries causes the price of cowpea beans to be much higher in the south than in the north of Nigeria. These differences are more pronounced at the end of the dry season and during the beginning of the rainy season. This can be explained by a lack of storage facilities on the one hand, and the great losses due to the difficulty to protect the cowpea against the cowpea seed beetle (Callosobruchus maculatus Fab.) on the other hand. Cowpea prices will thus rise till the new crop is harvested.

From July 1983 till January 1984, a market survey was conducted on 7 markets in the Local Government Areas of Dambatta, Gezara and Kazaure. The purpose was to try and obtain an idea about the evolution of the cowpea price before and after harvesting (figure 2). Only markets which lie near a permanent road have been visited, because time and transport means are factors limiting trade.

The price of cowpea beans is higher in July than in August, because of the greater demand for seed in July.

Cowpea prices are highest in September due to the very small supply of beans on the markets. From late September onwards, cowpea prices decrease. Traders claim that cowpea prices are lowest in February to increase again towards September.

7.Conclusions

In a previous article, the difficulties in getting the technical aspects of the cowpea packet accepted by farmers were

explained. The information in this study adds another dimension to the mere technical level. It shows that the economic factor is important as it is one of the elements which motivates or demotivates the farmer, producer of agricultural products. The farmer will be stimulated to go on producing for the market when he is sure that his product will be bought. In this respect the project should provide, apart from the technical assistance, also an economic support. This means providing credit facilities for those farmers who have not enough cash to buy all necessary inputs, and setting up a marketing structure which will ensure the farmer that his product will be bought at a fixed and remunerative price.

There still is a lot of work to be done on the financial and economic aspects of the project. In the first year of the intervention a number of inputs were borrowed for free from the project by the participants. They only had to pay for seed, seed dressing and insecticides. From the second year onwards, however, they were not only supposed to be able to use the new techniques on their own, but also to buy the inputs themselves (planter, E.D.-sprayer, pesticides, fertilizers). Without a proper credit system a lot of farmers will not be able to get access to these factors. Only the richer farmers will be able to do so. Even for those it is questionable whether they will invest in single crop cowpea. They will only do so when it has been proved that the single crop cowpea is more profitable than the traditional mixed cropping. As it is, the 1 year experiment of introducing the new variety and methods' packet was not very conclusive. The net returns of single crop cowpea in 1983 were smaller than the net returns of the traditional crop mixture fields in 1982. There are good agronomical (and ecological) reasons for this difference, but what the farmer gets out of it is that this new packet is not always as profitable as it claims to be.

The extension service has to persuade the farmers of the profitability and the reduced risks of a proposed change. In this respect a 1 year intervention is clearly not enough.

Moreover, one must also bear in mind that farmers in the

area still have other objectives besides the maximization of net returns per unit area. They may, for example, be wishing to maximize the profit on the most limiting resource (land, hired labour, family labour or labour used during a specific critical period) (Norman, 1975; Abalu and Etuk, 1986).

Farmers may also wish to maximize on food production stability and security (Walker and Jodha, 1986). There is a high risk attached to single crop cowpea growing (pests and diseases), and the means to minimize the risks (pesticides and fertilizers) are still too new and unknown, and too costly for the farmers. This partly explains the unwillingness of farmers to go through with the cowpea packet on a larger scale.

On the basis of the results of the surveys it is not possible to conclude whether the single crop cowpea is definitely better than the studied traditional mixed cropping system, on a return per unit of land basis. Correcting the data in table 3 for the 1983 dry year situation is in favour of the single crop cowpea. It will be necessary to compare both methods for some years before it will be possible to conclude which system is the best. As it is, one might say that both systems compare quite favourably, especially if one considers not only the financial, but also the social, economic and agronomic aspects of them.

A same phenomenon has been seen with traditional versus improved groundnut production in northern Nigeria: Abalu and Etuk (1986) concluded that both systems compared quite well with each other. Norman, et al.,(1977) found for the same region that improved sorghum and cotton technology under both hand and oxen cultivation was a good deal more profitable than the traditional methods.

The single crop cowpea would certainly have been better (in terms of monetary return per ha) if all the technical requirements of the packet had been met. As it is, the number of weedings and pesticide applications was smaller than the number prescribed by the project.

From the survey, it is also clear that the package which had a

clearly technical objective (increasing and improving inputs, introducing a new variety) had several economic (increasing net returns in terms of money, higher risk) and social (changes from old methods, additional labour burden, new variety with unknown properties) side effects which can work against the project.

The social aspect of the project which includes the difficulty of getting new techniques accepted, should obtain more consideration in the global extension approach. Norman (1973) already stated that the introduction of new technology in the north of Nigeria should conform to the goals and motivations of the farmers. The project should, therefore, in a first phase better concentrate on ameliorating traditional cropping systems and cultural practices known by the farmers than to try and introduce new techniques.

This integrated approach should also have a market price element in it, as it is a clear that the seasonal changes in cowpea prices are still rather pronounced. These could become smaller with appropriate storage facilities near the producer centres. They would enable the storage of larger quantities, ensuring a provisioning of the market, throughout the year, with equal amounts at almost stable prices.

The consumer side of a new introduction should also be considered. As it is, T.V.X.-3,236 is a promising new variety as far as yield possibilities are concerned, but this does not imply that the properties of the end products (dry beans and haulm) will suit the consumer. Good information about the qualities and advantages of the new variety should stimulate the consumers to try the new product. In a society as this where the lack of fuelwood is increasing the shorter cooking time could be a very good incentive. In this respect one can wonder why the project has not tried to promote I.T.A.-60. It is an improved variety which yields beans that are accepted by the consumer.

LITERATURE

ABALU, G.O.I. and ETUK, E.G. (1986). Traditional versus improved groundnut production. Experimental Agriculture, 22 (1), 33-38.

COUNET, M., DE GROOTE, H., DE SCHRYVER, A. en VAN DAMME, P. (1985). Voorstudie voor een Vredeseiland in Dapaong (Noord-Togo). Leuven, Vredeseilanden, 334 p.

EJIGA, N.O.O. (1977). Economic analysis of storage, distribution and consumption of cowpeas in Northern Nigeria. Ph.D. dissertation. Cornell University.

EJIGA, N.O.O. and ROBINSON, K.L. (1981). The economics of cowpea marketing in Nigeria. New York, Cornell University.

HAYS, H.M. and RAHEJA, A.K. (1977). Economics of sole crop cowpea production in Nigeria at the Farmer's level using improved practices, 13 (2), 149-154.

HENDY, C.R.C. (1977). Animal production in Kano State. Ministry of Overseas Development, Land Resource Division.

KNIPSCHEER, H.C., MENZ, K.M. and KHADR, F.H. (1980). Bench mark surveys of three crops in Nigeria: wheat, millet and sorghum. Ibadan, I.I.T.A.

LUNING, H.A. (1964). The measurement of labour productivity: a case study. Netherlands Journal of Agricultural Science, 12, 281-290.

NORMAN, D.W. (1973). Economic analysis of agricultural production and labour utilization among the Hausa in the North of Nigeria. East Lansing, Michigan, 48 pp.

NORMAN, D.W., PRYOR, D.H. and GIBBS, C.J.N. (1979). Technical change and the small farmer in Hausaland, northern Nigeria. East Lansing, Department of Agricultural Economics, 127 pp.

SAMPERS, W., VAN DAMME, P. and PAUWELS, F. (1986). Cowpea

(Vigna unguiculata (L.) Walp.): traditional and improved growing methods in northern Nigeria. Africa Focus, 2 (1), 55-92.

S.E.D.E.S. (1976). Mise en valeur des terres libérées de l'onchocercose: inventaire des ressources et programmation du développement de la vallée de l'Oti. Lomé, Ministère du plan, 251 p.

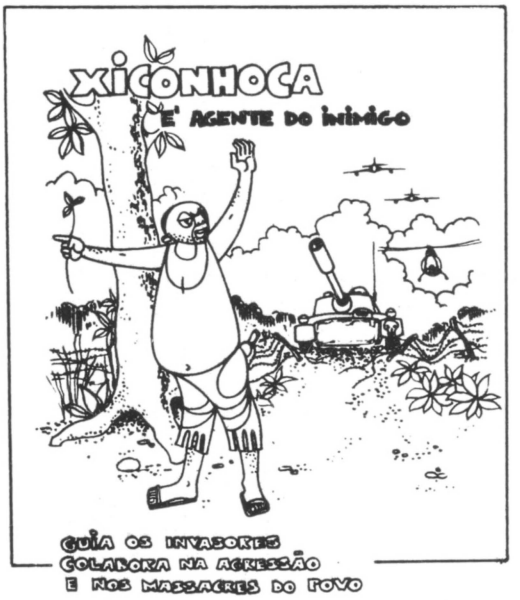
SMITH, M.G. (1955). The economy of Hausa communities of Zaria. Colonial Research Studies, no. 16. London, H.M.S.O. In Norman (1973).

TODARO, M.P. (1982). Economic development in the third world. London, Longman, 588 p.

WALKER, T.S. and JODHA, N.S. (1986). How small farm households adapt to risk. In: HAZELL, P., POMAREDA, C. and VALDES, A. (1986). Crop insurance for agricultural development. Issues and experience. Baltimore, John Hopkins, 322 p.

NOTE

(1) 1 Naira (1 N) = 100 Kobo = 1.30 US $ (1983).



"Xiconhoca, een contra-revolutionair die de vijand de weg wijst en deelneemt aan de agressie en uitmoording van het volk."

"Xiconhoca is een parasiet : Hij weigert te werken en deel te nemen aan de productie."

"Xiconhoca is een bureaucraat : Hij maakt het leven van de arme ingewikkeld".

'Xiconhoca' : een cartoon-figuur die de corrupte, negatief ingestelde Mozambiquaan belichaamt in posters, magazines, kranten, enz., uitgebracht door het Departement voor ideologische vorming (Frelimo).

J.B.