

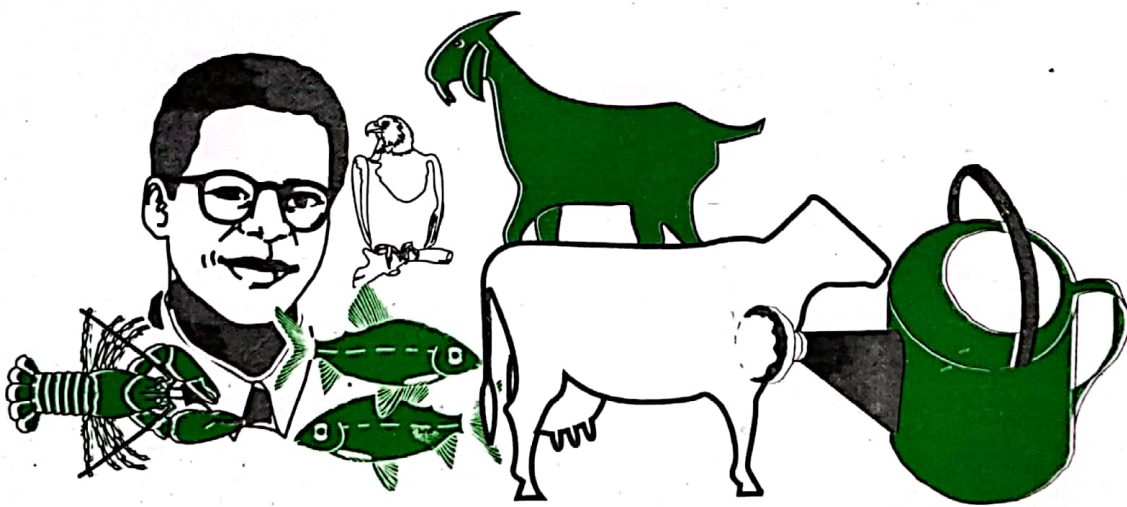
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COST AND RETURNS ANALYSIS OF COTTON PRODUCTION IN KATSINA STATE, NIGERIA

BY

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ABSTRACT.

The study examined the cost and returns of cotton production and identified the constraints associated with its production in Katsina State. A sample of 250 small-scale farmers was purposively selected from Malumfashi, Funtua and Daudawa in Katsina State. Data were obtained from farmers through interview schedules. The data collected were analysed using descriptive statistics and budgeting techniques. The cost and returns analysis indicated that the cost of fertilizer and other inputs like chemicals and seed accounted for 18% of the total variable cost incurred in cotton production. It was found that cotton production was profitable as indicated by the average net income (₦20526.30). The total cost of production was (₦45796) while the total revenue was (₦66216.66) and the average net return showed that small holder cotton enterprise is profitable. Despite the profit margin, farmers were confronted with the problem of high cost of inputs especially fertilizer, improved seed, adulterated chemicals. The paper recommended that farmers should form cooperatives in order to put resources together to purchase inputs particularly herbicides and pesticides.

Key words: Cost, Returns and Cotton Production

INTRODUCTION

Cotton (*Gossypium hirsutum* L.) is one of the most important cash crops in the Nigerian economy. It is grown by about 0.8 million farmers in a total estimated area of 6000 - 7000 hectares (Idem 1999). It ranked second to groundnut as cash crop of the Northern Nigeria (Ogunlela 2004).

Cotton has made substantial contribution to government revenue through taxes and export; it provides employment to many farming households, grinders, and raw materials for textile industries. In addition, cotton seeds provide edible oil for human consumption while cotton seed cake is used as raw material for livestock feed due to its high protein content. However, in recent years there has been a sharp decline in the production of cotton, despite increasing domestic demand. This has led to the importation of cotton which represents a serious drain on Nigeria's foreign exchange. Also, resource allocation to cotton production is low when compared to crops such as maize, sorghum, this may be because cotton is a cash crop and the problems associated with its production. Cotton is labour intensive with most operation carried out manually at the traditional level Adeniji (2002) and (Ibrahim, 2005)

The issue of farm costs and returns analysis is a very important one, especially where it concerns the economics of farming as a business. However, most small-scale farmers who are the bulk of producers in the agricultural sector in the country do not take into account the cost of production and actual returns from sales (Olayide and Head, 1982, and Schippers 2000). This study intends to provide answer to the following (i) Identify the socio-economic characteristics of the farmers in the study area (ii) estimate the input-output relationship of the crop (cotton) the profitability of the cotton production business and determine constraints inhibiting cotton.

METHODOLOGY

Sampling techniques and data collection procedure

The study utilized primary and secondary data. Primary data were collected from 250 small-scale farmers in Katsina State by means of interview schedule. Katsina State is located in the Northern fringes of Nigeria. It is bounded by Kaduna state to the South, Sokoto to the West and Kano state to the East. Katsina is situated between latitude $11^{\circ} 13' N$ and longitude $6^{\circ} 09' E$, with a land area of about 2593sqKm out of which 1.64 hectares are arable (Katsina 2000) The entire state falls within Sudan savannah vegetation zone.80 percent of the people are small-scale rural farmers. The mean annual temperature is between 29 and $-39^{\circ}C$. Total annual rainfall is between 350 and 1000mm in the driest and wettest parts of the state respectively. The farmers were selected from Funtua, Malumfashi, and Daudawa villages in Katsina state . The areas were purposively selected because of high concentration of cotton farmers, proximity to Institute for Agricultural Research (IAR) and access to the extension activities of Katsina State Agricultural Development programme (KTARDA) While, a simple random sampling technique was used for the choice of respondents within each of the selected zone, One hundred farmers(100) were selected from Funtua, and 75 farmers each from Malumfashi and Daudawa The difference in the sample size was due to concentration of cotton farmers in Funtua .In all, a total of 250 farmers made up the sample size for the study.

Data were collected on the socio-economic variables, like age household size, formal education,, sources of information, membership of cooperatives, farming experiences, ownership of land, and others.

Also, data such as resource allocation, which include labour in man days, inputs, cost of items as well as output (yield) were taken. Data were collected with the aid of questionnaire.

Analytical Tools

The data were analysed using descriptive statistics and budgeting techniques. A farm budget is a detailed physical plan for a certain period. The farm budget enables us to consider the resources used, estimate expected receipt, expenditure and net farm income. Fixed and variable costs make up the total expenditure. The budgeting tool was used to determine the Net farm income (NFI) net farm income according to Olukosi and Erahbor (1988) is expressed as

$NFI = TR - TC$; where:

NFI=Net farm Income (N/ha)

TR=Total revenue (N/ha)

$TC = \text{Total cost (N/ha)}$
 The depreciation value of assets was determined using a straight -line depreciation method.

Profitability index (PI) is the total net income (TNI) per unit of gross revenue i.e. $PI = \text{TNI/GR}$ (Alimi and Odogun,2001) the value for gross margin GM was estimated by finding the difference between the total revenue (TR) and the Total Variable cost TVC i.e. $GM = TR - TVC$, rate of return on investment (%) = $\text{NI/TC} \times 100\%$, Rate of return on fixed cost (%) = $\text{(TR-TVC/TFC)} \times 100\%$.

RESULTS AND DISCUSSION

Table 1 shows that the mean age of respondents was 46 years. Most of the respondents (56per cent) were in the productive age, while old farmers constituted 15per cent. The results agree with the findings of Akinola 1986, Williams and Williams (1983). Young farmers tend to be more flexible in their decision and accept new ideas more readily because of the anticipated longer life span within which the investment in new technology will pay off. It could also be adduced to the fact that young farmers can face challenges of cotton production, given the demand for cotton crop.

The result showed that the level of formal education was low among the farmers. More than 50 percent never received formal education. Only 6 percent had secondary education and 7 per cent had tertiary education. The low educational level is a characteristic which these villages share with most peasants' population in Nigeria.

The study also revealed that the household size of respondents was large. Most households have 1-5 persons (48per cent) while another 48per cent had between 6-10 persons, only 4per cent had 11-20 persons. The large household structure is expected because of propensity of African culture, having large family as a status symbol and the extended family syndrome.

The results of farming experience revealed that 55 per cent of the respondents had between 1-10 years experience in farming while about 24 per cent had between 11-20 years experience.

Land is a major production resource, and lack of it is a major factor limiting of production. Results show that farm lands were highly fragmented. The mean farm size for cotton was 4hectare, which means majority of farmers were small-scale farmers.

The study revealed that there is inadequate knowledge of the usefulness of belonging to cooperatives or any farming association. Only 27 per cent of the respondents were members of 1-2 rural organisations. This may not be unconnected with the haphazard nature by which the existing cooperatives are being run.

The use of inputs and the adoption of yield inducing techniques have given rise to an increased need for agricultural credit. However, about 86per cent of the respondents could not obtain credit from the sources listed viz. Cooperatives societies, local lenders, banks, relatives. Various reasons stated by respondents range from lack of collateral to high interest rate.

Over 90 per cent of the respondents reported that they hire labour for their farm activities to support their family members that work on the farm. The mean money expended on labour was #5000. The high labour cost reported by most respondents could be due to the fact that cotton requires a lot of labour from planting to harvesting.

Moreover, the amount charged for labour is always high because of the difficulty in weeding or harvesting cotton farm.

Production in any enterprise involves the use of resources which have costs. Table 2 shows the cost and returns of cotton production in the study. The major component of the variable costs are cost of fertilizer (18 per cent) and labour(73per cent) The higher labour cost percentage implies that more time is devoted to land preparation, remolding and harvesting. Cotton as a crop requires a lot of labour to be able to have desired yield. The high percentage of cost on fertilizer which form a major component of variable cost is not unconnected with the removal of subsidy on fertilizer which makes the commodity expensive in the open market. The study also revealed that fixed cost was very small 9 per cent and it includes depreciation on farm implements like hoes, cutlasses, knapsack sprayers. Other costs accounted for about 18 percent of the total cost.

The cost and returns analysis of cotton production was profitable as indicated by the average net farm income (₦20,526.30) Thus the farmers consider cotton enterprise as profitable.

Table 1. Socio-economic characteristics of the farmers.

Socio-economic variables	Frequency	Percentage
Age		
Less than 29	15	6
30-39	43	17
40-49	98	39
50-59	56	23
60-above	38	15
Total	250	100
Farming experience		
1-5 years	71	28
6-10	68	27
11-20	65	26
21-30	27	11
30 and above	19	8
Total	250	100
Membership of cooperatives		
None	152	61
1-2	68	27
3-4	5	2
5 and above	25	10
Total	250	100
Education		
Primary	28	11
Secondary	16	6
Tertiary	19	8
Koranic	102	41
Adult education	65	26
No education	20	8
Total	250	100

Socio-economic variables	Frequency	Percentage
Farm size	198	79
1-5 ha	26	10
6-10	22	9
11-20	4	2
21 above	250	100
Total		
Household size		
Wives, children, dependants	89	35
1-10	107	43
11-20	27	11
21-30	27	11
31-40	250	100
Total		
Credit received		
Yes	38	15
NO	212	85
Total	250	100

Field survey 2005

Table 2: Cost and returns of Cotton production in Katsina State

Item	Value (N)	Percentage
Fixed Costs		
Depreciation on fixed capital items	2650.00	5.80
Rent	1600	3.50
Total Fixed Cost(TFC)	4164.00	
Variable Costs		
Labour(hired & family)	33,264.00	72.80
Other Costs(FYM,Cotton seed, agro chemicals, Cost transportation)	8,182.00	17.90
Total Variable Cost(TVC)	41,426.36	
Total fixed Cost(TFC)	4,164.00	
Total Cost (TC) (TFC+TVC)	45,796.36	100
Total Returns	66216.66	
Average Net Farm income (TR-TC)	20,526.30	
Gross Margin (TR-TVC)	24790.57	
Capital Turnover=B/A=66216.66/45690.36	1.48	

Field survey 2005

Costs and Returns

Farm budgeting analysis, using the net farm income method was employed in the study. The profitability of any business can be deduced from the relationship between the costs

incurred in running the farm business and the returns. According to Adegeye and Dittoh, (1985) the result of the farm budgeting analysis (table 2) show that the major components of the variables costs are cost of labour (72.80 percent) and other costs (Farm yard manure, cotton seed, cost of transportation and agrochemicals) (17.90%). The high percentage of inputs could be attributed to the fact that majority of the farmers use both family and hired labour and could not afford the use of agrochemicals. Besides, most farm work is done with little or no supervision, this lead to the use of excessive labour utilization. This is similar to the observation made by Jirgi *et. Al.* (2009) and Kudi (2000). The study also revealed that the fixed cost was small (9.3%). This could be attributed to low capital investment by the farmers. This is in agreement with the findings of Jirgi *et al* (2009), Sani *et. Al.* (2003), Alamu *et. Al.* (2000) and Kudi (2000). The results also show that farmers earned an average net farm income of ₦20,526.30 and gross margin of ₦24,790.57 implying that small scale cotton production is profitable

Production Constraints by cotton farmers

Table 3 shows constraints identified by farmers. Since the recommended cotton varieties require 140-180 days to reach maturity the recommended sowing date for cotton in the major growing zone is mid June which is always the time rains have established so that the crop can take full advantage of the growing season. However, most farmers in the study area planted their cotton late in July. The main reason given by 70 percent of the respondents was that they prefer to plant their food crop first and then later use the remaining area/labour for planting of cotton. Studies have shown that reduction in seed cotton yield can be attributed to delayed planting (Ogunlela, 2004)

Another constraint identified by over 70 per cent of the respondents was pests and diseases. Cotton as a crop is susceptible to attack by numerous insects and diseases through out the life cycle and the effective control of these is inevitable if reasonable yield is expected. The most important group of insect in terms of economic costs is the bollworm.

Apart from their ability to reduce yield certain cotton pest can also cause reduction of lint quality (*Dysdercus sp*) causes discoloration of the cotton lint, which automatically represent a serious decline in quality and substantial reduction in price. About 60 percent of the respondents said their farms were attacked by aphids, bacteria blight (*xanthmonas malvacearum F. Smith*) downson and alternaria leaf spot (*alternaria macopora Zim*) the spread of these two diseases is capable of destroying an entire cotton fafrm

Most of the farmers (55 percent) complained of not having enough money to purchase chemicals to combat these diseases, although the economic advantage of spraying could lead to increase yield thereby justify the costs, the invested. Top on the list was the problem of frequency of spraying. Cotton requires constant spraying to get the maximum yield.

Investments on purchasing spray equipment and agro chemical could constitute a burden on farmers. Spaying is one of the most difficult tasks for the farmers to perform successfully on their own. It requires skills that are new to most traditional farmers. Small scale farmers spay against pest mainly on a curative basis approximately twice per season whereas cotton requires about six spray to do well.

Also the efficacy of spraying may not be quickly obtained as there are a lot of fake chemicals in the market. This emphasizes the need for more extension activities on integrated pest management that will reduce the number of spray.

Another constraints identified by 52 per cent (Table 3) was availability of labour during harvest. Cotton unlike other crops has to be picked many times, which means payment for labour. If not picked on time the quality can be affected because it can change colour or be contaminated by foreign particles that might lower the grade in the market. Cotton requires constant labour at harvest and during production (planting, weeding, and thinning) and because it can itch, most labourers are scared to work on cotton farms. In addition, it competes with other crops like maize, millet for labour in allocation of small holder's resources. The allocation of farmer's resources to cotton will depend on the comparative advantage enjoyed by cotton compared with the competing crops.

Labour intensiveness and capital investment associated with cotton production renders it a disadvantaged crop amongst the competing crops such as cereals and pulses which are also grown by farmers. This becomes relevant when one compares the very low yield of cotton and relatively high yield obtained from cereals requiring less labour and other investment.

Most of the operations involved in cotton production are still being done manually and of these harvesting and weeding appears to be the most labour intensive.

While the average labour requirement for the production of one hectare of cotton under improved system is about 430 man-hour, about 15 percent of this is required for fertilizer application, while some 63 percent is used in harvesting operation. However, with mechanized systems much labour is saved but this is still not within the reach of average peasant farmers.

Table 3. Distribution of respondents according to constraints faced in cotton production

Constraints	Frequency	Percentage	Rank
Late planting	176	70	1
Frequency of spray	137	55	2
Labour for harvest	130	52	3
Time of spraying	107	43	4
Marketing	100	40	5
Frequency of harvest	106	42	6
Storage after harvest	96	39	7
Land preparation	89	36	8
Delay in payment for cotton bought	79	32	9
Rain during spraying	41	16	10

CONCLUSION AND RECOMMENDATION

The study has shown that cotton production was profitable as indicated by an average net income of ₦24,790 however cotton producers are confronted with production constraints of high cost of fertilizers, fake chemicals, high cost of labour, inadequate storage, access to credits. Farmers could make more profits if these constraints are addressed. Farmers should form cooperatives in order to pull resources together so as to be able to purchase inputs particularly herbicides in order to reduce the use of manual labour. The use of more labour saving innovations, availability of necessary inputs is recommended.

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