

Labour Arrangements in Cassava Production in Oyo State, Nigeria

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Keywords: Labour arrangements- Cassava enterprises- Profitability- Productivity- Nigeria

Summary

The study examined the effects of labour arrangements on the profitability of cassava enterprises in Oyo North Area of Oyo State, Nigeria. A multi-stage sampling technique was adopted for data collection, while data were analysed using descriptive statistics and budgetary analysis. The results show that the prevalent labour arrangements for cassava enterprises are: a combination of Family, Hired and Contract labour (38.9%); Family-Hired labour (27.8%); Family-Contract labour (31.1%). The gross margin per hectares across labour arrangements are ₦279481.99 (all-labour), ₦286044.24 (family-hired), ₦216940.10 (family-contract), and ₦235000.00 (family only). The returns on a naira invested on variable costs across different labour arrangements for cassava enterprises are ₦2.04 (all-labour), ₦3.66 (family-hired), ₦2.37 (family-contract), and ₦2.61 (family only). This implies that a unit (₦1) variable cost in the various labour arrangements of all-labour, family/hired, family/contract and family only in cassava production will yield a marginal return of ₦3.04, ₦3.66, ₦2.37 and ₦2.61 respectively. Family-hired labour arrangement yields higher marginal return per unit of manday and one naira spent than all other arrangements. The study recommends among others the application of labour-saving technologies and an optimum combination of various labour arrangements to reduce the cost of labour used in cassava production.

Résumé

Arrangements de travail dans la production de manioc dans l'Etat d'Oyo, Nigeria

L'étude a examiné les effets des accords de travail sur la rentabilité des entreprises de manioc dans le secteur d'Oyo, au nord de l'Etat d'Oyo, au Nigeria. Une technique d'échantillonnage en plusieurs étapes a été adoptée pour la collecte des données, tandis que les données ont été analysées à l'aide de statistiques descriptives et de l'analyse budgétaire. Les résultats montrent que les dispositions qui prévalent pour les arrangements de travail pour les entreprises de manioc sont: une combinaison de la famille, engagés et un contrat de travail (38,9%); famille-travail salarié (27,8%); famille-contrat de travail (31,1%). La marge brute par ha à travers des arrangements de travail sont ₦279481,99 (tout-travail), ₦286044,24 (famille- embauche), ₦216940,10 (famille-contrat), et ₦235000,00 (famille uniquement). Les rendements sur un naira investi sur les coûts variables entre les différentes modalités de travail pour les entreprises de manioc sont ₦2.04 (tout le travail), ₦3,66 (famille-embauche) ₦2,37 (famille-contrat) et ₦2,61 (famille seulement). Ceci implique que l'unité (₦1) du coût variable dans les divers arrangements de travail de tout-travail, la famille-embauche, la famille-contrat et la famille dans la production de manioc produira un rendement marginal de ₦3,04, ₦3,66, ₦2,37 et ₦2,61 respectivement. La main-d'œuvre salariée a donné un rendement supérieur marginal par unité de l'homme-jour et un naira dépensé que tous les autres arrangements. L'étude recommande, entre autres l'application de technologies économisant le travail et une combinaison optimale des divers arrangements de travail pour réduire le coût de la main-d'œuvre utilisée dans la production de manioc.

Introduction

Cassava production is one of the key agricultural enterprises providing household income and is a promising enterprise for poverty alleviation and industrial revolution in Nigeria. Cassava constitutes the bulk of the daily dietary intake of most Africans, particularly those in the countries within root and tuber producing belt, especially in Nigeria. Nigeria continues to be the largest producer of cassava, with the majority of the population below the Niger depending mainly

on the crop for daily dietary requirement. Cassava is an important food security crop with a promising export potential. Cassava is also rated top among potential feedstock for biofuel production in Nigeria (1). The production of cassava is still predominantly manual and labour-intensive, employing mainly traditional tools and manual labour for virtually all production operations. Labour has always been identified as a major limiting factor in peasant farm

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Received on 05.09.11 and accepted for publication on 06.12.11.

production of crops such as cassava (2, 5). There is a high labour requirement for cassava production operations including land clearing, land preparation, planting, weeding and harvesting (4). Other labour consuming operations are transportation, storage and post harvest processing. The high labour demand is reducing the prospects of producing cassava for food or fuel compared to other staple crops which have lower labour demand. The continuous rural-urban drift, depleting the pool of available farm labour in the rural areas is further stretching the labour availability and cost, leading to increase in cassava production cost.

High cost and scarcity of farm labour, which is a critical input in cassava enterprises, led to the adoption of various labour arrangements. Labour arrangements based on crop sharing and giving of land in lieu of wages or payments have a long history and are widespread, not only in Africa but throughout the tropical world (7). The existence of work peaks makes labour input critical. Work peaks occur because critical tasks such as planting, weeding and harvesting are highly seasonal, time bound and must be completed within a specified period of time. This critical nature of labour in most cases leads to the hiring of labour on a seasonal and contractual basis to reduce the pressure of peak periods. According to Swindell (7), in parts of West Africa, seasonal labour migration between different agro-ecological zones provides a partial solution to labour shortage. Ezedinma (3) observed that labour for cassava and yam production is mostly hired from within the village, neighbouring villages, or villages in neighbouring countries. This study examined and compared the preference and choice of various labour arrangements for various cassava production operations and ascertained their profitability in cassava enterprises in southwest Nigeria. The study brings to the fore issues relating to the productivity of different arrangements, reasons for preference and the viability of the arrangements in cutting down prohibitive labour costs.

Methodology

The study was carried out in three local government areas (LGAs) of Iseyin, Saki West and Saki East of Oyo North Area (Oke Ogun) of Oyo State, Nigeria. The LGAs are purely agrarian and fall within the major root and tuber producing zone of Nigeria. Ninety cassava farmers were purposively and randomly selected for the study. In collecting the primary data, a structured questionnaire was used in the survey. The questionnaire was constructed to elicit information on crop enterprises, availability and use of farm labour for different operations, farmers' preferences for labour types, trend of labour migration, preference and choice of labour, labour peak periods, payment methods, and socio-economic characteristics. Other

questions included are quantity and quality of other inputs used and their cost, farm yield and market value of output, level of mechanisation, adoption of technology, etc. Secondary data was sourced from the Agricultural Development Project at the State Government level to supplement survey data.

The data collected were analysed using descriptive statistics and budgetary analysis (Gross Margin Analysis).

Gross Margin Analysis (GMA) is expressed as:

$$GM = GI - TVC$$

Where, GM= Gross Margin, GI= Gross Income (monetary value of output),

TVC= Total Variable Cost.

This is fully expressed as:

$$GM = \frac{\sum [R - (NLC_j + LC_{ij})]}{\sum ha}$$

Where:

R= Total Revenue

NLC= Non-labour costs

LC= Labour costs

i= For family, hired and contract labour costs components

j= List of farmers

Results and discussion

Socio-economic characteristics of cassava farmers

Two distinct categories of cassava enterprises were identified in the study area. These are Sole Cassava (SC), Cassava Based (CB) – which is cassava production grown either with cowpea, maize or melon on the same plot. More farmers (53%) practiced mixed cropping. The prevalent crop mixtures in CB enterprises are: cassava-cowpea (16.7%), cassava-maize (31.1%), and cassava-melon (5.6%). The average age of cassava farmers is 52 years, while only a few farmers – 23.8% for SC and 25% for CB are below the age of 40 years. Most (97%) of the farmers in the two categories have over 10 years farming experience. Most of the farmers, 93% for SC and 90% for CB enterprises, are male. This indicated and confirmed that cassava like other labour demanding root and tuber crops is a man's crop (6).

The average farm sizes are 1.4 ha for SC and 1.7 ha for CB enterprises. Majority of the farmers in the two categories cultivate less than 2 hectares. This implies that majority of the cassava farmers in the study area cultivate small farm units. This is indicative of the small farm holding that characterised crop production enterprises in sub-Saharan Africa. The small sizes of farm holdings is a key obstacle to implementing an efficient mechanisation of cassava production operations such as land clearing and preparation which would have greatly reduced labour cost and drudgery. Further results revealed 78.6% for SC

and 83.3% for CB do not belong to any farmers group or cooperative through which they can access credit facility, organize the pooling of resources for purchasing inputs at reduced prices as well as facilitating produce marketing for obtaining optimum profit. This lack of cooperation can hamper the delivery of cassava enterprises development interventions delivered through farmers' groups. This can also affect the ability to harness opportunities and niches that come through collective actions of farmers with respect to inputs, crop marketing and participation in participatory crop improvement programs. The low membership of groups is indicative of the extinction of cooperative labour arrangements.

Labour arrangements in cassava production

Four major labour arrangements were identified for cassava production. 38.9 percent of the farmers used all-labour types arrangement available in the area for their production. This labour arrangement uses a combination of family, hired and contract labour. Other labour arrangements are the family-hired labour arrangement (27.8%), family-contract labour arrangement (31.1%), and enterprises using mainly family labour (2.2%). The use of all-labour types arrangement ranked first and family labour alone, ranked last. The use of all-labour type arrangement occurs in situations where partial labour contracting is prevalent. In this situation, farmers employ contract labour for farming operations when at the beginning of the production season there is no capital for employing hired labour, and only revert to hired labour when enough proceeds (from early maturing crops) have been made. Farmers using all-labour types arrangement devote partial contract workers mainly to land moulding and weeding, hired for bush clearing while family labour is engaged mostly for planting and supervision. Family labour featured in all the labour arrangements as farmers and their spouses are involved in the supervision of most operations.

Contract labour

Contract labour arrangements are used in the study area by cassava farmers in combination with family labour and /or hired labour. In contract arrangements, the migratory farm workers from neighbouring countries of Togo, Benin and States in Nigeria (Benue, FCT, Kogi, Nasarawa, Kwara) take up residence on the farm with contracts of one or two years to work for the farmer landlord for the payment of a reward agreed on at the start of the contract or arrived at for every operation, and summed up through the contract period. Contract labour takes two forms: partial or full contract.

Partial contract labour

In partial contract labour arrangements, the farm workers do not take up residence with the farmer. This resembles hired labour but the difference lies in

the deferred payment and the differential in the price paid for labour. The difference between hired labour and contract labour charges ranged between the ratios of 1:1.5 or 1:2. In this arrangement, farmers provide for feeding on the farm on the day the workers are engaged. The availability of labour for farm work is very low in this arrangement. Some of the farmers utilising this form of labour complained of labour shortage during the peak production period. Payment in this form of labour is always in cash, compared with full-contract arrangements with payments done with items such as motorcycles and bicycles, clothing, and return fares to workers place of origin.

Full contract labour

In full contract labour arrangement, farm workers take up residence with farmer landlord, who provides free accommodation and feeding all through the contract period except on workers' weekly free day (mostly Sundays). On such days, workers engage in hired labour called job. Payment for this arrangement is done with an item which is the value of the labour for the contract period. This payment is also complemented with cash. Migratory farm workers return to their countries or States after each contract term or at the end of each season for contracts more than one season. Contract workers are available first for the farmer landlord's work and would require the permission of the farmer (*oga loko*) to offer their services to other farmers. Full contract provides a form of insurance against labour shortage for critical operations.

Hired labour

Hired labour arrangement is used mainly by farmers who have savings or access to a source of finance for farming. The reward for this labour type is lowest, as price negotiation is always in favour of the farmer. In this arrangement, farmers are price makers, while farm workers are price takers. Hired labour use is prevalent during critical operations of land clearing and weeding for cassava production. Providers of hired labour in most locations are contract farm workers who use their free rest time to engage in short-term jobs for a day in a week or more days during the off-season and indigenous subsistence farmers who have spare time and can dispose of their free labour in return for cash. Workers engage in this arrangement for supplementary income to meet a cash shortage or meet urgent or essential needs.

Labour arrangements and preference by cassava enterprises

Table 1 shows the labour arrangement based on the crop enterprise in the study area. Family labour only is used mainly for SC (2.2%). Fifty percent of CB farmers use all labour types for their production. Family-Contract labour is prevalent for SC (21.1%). These are

Table 1
Labour arrangements by crop enterprises

Labour Arrangement	Sole Cassava		Cassava based (Mixed)	
	Freq	%	Freq	%
Family-Hired labour	10	11.1	15	16.7
Family-Contract labour	19	21.1	9	10.0
Family labour only	2	2.2	0	0.0
All-labour*	11	12.2	24	26.7

* All labour arrangement combining Family, Hired and Contract labour.

the use of all types of labour (family, hired, contract), and combined family-hired labour arrangements. Other arrangements were the combination of family-contract labour and only family labour arrangement. All-labour arrangement is more prevalent in CB enterprises. This result implies sole cropping farmers are more inclined to using family-contract labour than family-hired. The reason for this choice has to do with the lack of capital for running farm business, as many of the farmers have to wait until harvest to clear their labour bills. Cassava farmers in the two different categories of enterprises indicated a higher preference for hired labour in comparison to other forms of labour arrangements. The preference for a particular labour arrangement is based on the perceived benefit of reducing associated labour cost or optimising the available labour for the crop production.

Revenue and cost structures for cassava enterprises

Table 2 shows the revenue, total variable costs, total fixed cost (implements), gross margin and the net farm income (NFI) for sole cassava and cassava based (mixed-cassava) enterprises. Contract labour takes a large share of the total variable costs (TVC) for both farming enterprises; 64.2 percent for sole cassava and 58 percent for cassava based. This agrees with Ogunsumi and Saka (5). The total variable cost for sole cassava enterprise (₦93190.85) is higher than that of cassava based enterprises (86345.96). The gross margins per hectare for sole cassava and cassava based are ₦198386.40 and ₦302275 respectively. This shows mixed cassava cropping (cassava based) had a higher gross margin than the sole cropping. The return to a naira of total variable cost invested in sole cassava and cassava based enterprises are ₦2.10 and ₦3.50 respectively. The results imply that a unit (₦1) invested in sole cassava enterprise will yield a marginal return of ₦2.10, while a unit (₦1) invested in cassava based enterprise will yield a marginal return of ₦3.10. The higher gross margin from cassava based (mixed cropping) enterprises is the highest return per hectare cultivated and this relates to the optimal use of the farming space within a farming season.

Gross margin analysis by labour arrangements

Table 3 shows gross margin per hectare across various labour arrangements. The gross margin per hectares across labour arrangements are ₦279481.99

Table 2
Revenue and Cost Structures for Cassava Farms (Per Hectare)

Items	Sole Cassava Value (₦)*	Percentage TVC	Cassava-based Value (₦)	Percentage TVC
Total Revenue	291577.20		388621.00	
Variable Inputs:				
Pesticide	-	-	-	-
Herbicides	151.01	0.2	18.08	0.0
Fertilizer	402.68	0.4	572.57	0.7
Tractor Hire	973.15	1.0	2418.64	2.8
Planting materials 1	14587.72	15.7	13675.87	15.8
Planting materials 2	-	-	1799.06	2.1
Family labour	8669.65	9.3	7201.97	8.3
Hired labour	8605.52	9.2	10564.54	12.2
Contract labour	59801.12	64.2	50095.23	58.0
Total Variable Costs	93190.85	100	86345.96	100
GM	198386.40		302275.00	
Fixed Costs:				
Cutlass	1869.13		1758.68	
Hoe	2155.03		1917.55	
Knives	451.85		557.26	
Baskets	625.67		771.09	
TFC	5101.68		5004.58	
NFI	193284.70		297270.50	

* \$1 c. ₦151 in 2011.

Note: Planting Materials 1= Cassava Stem; Planting Materials 2= planting materials for other crops combined with cassava in cassava based enterprises.

Table 3
Gross margin analysis by labour arrangements for cassava

Labour arrangement for cassava	Revenue (₦)	Total Variable Costs (₦)	Total Labour Cost (₦)	Gross Margin (₦)
Family-Hired labour	364095.90	78051.66	61153.14	286044.24
Family-Contract labour	308393.90	91453.80	74731.01	216940.10
Family labour only	325000.00	90000.00	75000.00	235000.00
All-labour types	371556.70	92074.72	73728.87	279481.99

\$1 c. ₦151 in 2011.

(all-labour), ₦286044.24 (family-hired), ₦216940.10 (family-contract), and ₦235000.00 (family only). The returns on a naira invested on variable costs across different labour arrangements for cassava enterprises are ₦2.04 (all labour), ₦3.66 (family-hired), ₦2.37 (family-contract), and ₦2.61 (family only). This implies that a unit (₦1) variable cost in the various labour arrangements of all-labour, family-hired, family-contract and family only in cassava production will yield a marginal return of ₦3.04, ₦3.66, ₦2.37 and ₦2.61 respectively. Family-hired labour arrangement yields higher marginal return per unit of manday and one naira spent than all other arrangements. This implies it is more profitable to utilise more of family-hired labour for cassava production.

Conclusion

The study investigated the various labour arrangements used in cassava enterprises in Oyo North area of Oyo State, Nigeria. The various labour arrangements used for cassava production were identified and compared in terms of their profitability. Four major labour arrangements have been found to be prevalent in the study area. These are All-Labour types, seen in the scenarios where farmers apply family, hired and contract labours for their farming operations; family-hired labour, family-contract labour and family labour

only. The fact that majority of cassava farmers use a combination of all types of labour category is due to their inability to engage their preferred (hired labour) or the cheapest type of labour. The preference of the cassava farmers for hired labour is due to the perceived cheaper cost when compared with other types of labour arrangements. The small farm sizes which are indicative of subsistence production objective and problems associated with cassava production (lack of finance and scarcity of labour at some critical period in the production season) explain the farmers' use of various combinations of labour arrangements for optimal crop yield. To reduce the high costs associated with contract and hired labour arrangement, the use of a combination of labour saving technologies – tractorisation and application of herbicides are recommended for optimum management of cassava enterprises.

Acknowledgments

The author appreciates the International Institute of Tropical Agriculture - IITA (Nigeria) for funding the fieldwork and granting graduate research fellowship to the author while the research lasted. The author also appreciates the Fortum Foundation, Finland funding his doctoral study, during which period this article was written.

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