

Labor Availability for Food and Tree Crops Production in Southwestern Nigeria

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Abstract

Labour availability at peak periods has become a major challenge to farmers who rely mostly on human labour for their activities. However, studies on availability of labour are scanty. Hence, this study was carried out to investigate labour availability of farmers listed in Agricultural Development Program (ADPs). Through simple random sampling, two (Oyo and Ondo) states, 50% of zones, 10% of blocks and 2 cells; one each for food and tree crops were selected to give 4 and 2 cells respectively. Ten percent of food (240) and tree (214) were randomly selected. Of the respondents, 35.8%, 30.8% were within the age of 50-59 years, 56.7%, 59.9% had modal family size of 1-5 persons, 39.2%, 47.2% had no formal education and farm size of >5ha was owned by 49.2%, 57% food and tree crop farmers respectively. Labour availability was significantly related to marital status ($\chi^2=20.0$) and education ($\chi^2=17.4$) of Food Crop Farmers FCF as well as sex ($\chi^2=48.2$), farmers association ($\chi^2=15.8$) and residency ($\chi^2=12.5$) of Tree Crop Farmers TCF. Mann-Whitney U test showed significant difference in labour availability food crop ($z=-4.38$, $p \leq 0.05$) and tree crop ($z=-4.75$, $P \leq 0.05$) farmers. Multivariate analysis shows that significant linear relationship existed between the dependent and the independent variables ($F=4.235$ (food), $F=3.902$ (tree)). Labour availability was significantly reduced by farmers association ($\beta=-0.555$) and residency ($\beta=-0.121$) among food crop farmers and residency among tree crop farmers ($\beta=-0.334$) and for FCF.

Hence, development policy should focus on technology that saves labour and are appropriate for farming.

Introduction

The principal constraint to increased agricultural production is shortage of labour at critical production periods. Chianu (2000) revealed that it has been observed as a limiting factor of production in farming system of sub-Saharan Africa. Pearce and Artkinson (1994) had rated labour shortage as second most obvious constraint to agricultural productivity that was independent of biophysical and technological limits. Sender and Smith (1990) also confirmed unsatisfied demand by employer of manual agricultural wage labour in rural Africa and suggested that it requires further investigation.

Olayide and Atobatele (1980), Okoriji (1990) and Adejare (2014) affirmed labour scarcity during peak production season among farmers.. Out migration of some farm household members reduce labour availability for agricultural activities from the household pool (Federal ministry of agriculture and natural resources, 2009). Majority of seasoned farmers are aged as they become weaker, they grow fewer crops; others have poor health and absence of active members of household affect output causing a disproportionate reduction in production. Inadequate labour reflects that labour, which was assumed to be in abundance in developing nations like Nigeria, is now scarce in many part of the country.

Hence, labour availability has become a major challenge to Nigerian farmers. At work peaks, hired labour is low as wages rise. And supply of labour for agricultural activities has become scarce, seasonal and expensive. Labour is a more complex resource than is apparent at first. Agricultural surplus labour is lacking and unpaid labour is no more readily available for agricultural production. Yet, annual cropping by traditional method requires more labour and agricultural production in most rural areas labour intensive.

Statement of the problem

In spite of large population of Nigeria, farm labour supply especially for planting, weeding and harvesting still constitutes serious bottleneck. The land cannot till itself and where machine is used, human labour is needed to drive the engine. Availability of family labour has declined due to increase in rural-urban migration of farm families. Besides, perceived better economic opportunities in urban centers have contributed to the problem of scarcity of labour for farm

work. Depletion of agricultural labour force with no commensurate substitution of capital in place of displaced labour makes agricultural productivity to fall. In addition, hired labour is expensive and less affordable by farmers who are mostly resource poor. High cost of labour leads to high cost of production. Consequently, most farmers cannot expand their scope of production since cropping by traditional method requires more labour.

Thus, the nation is witnessing an increment in prices of foods stuffs which is not attributed to inflationary tendencies alone, but these increments in prices are due to fall in production. Food prices have risen dramatically that many people especially in the urban areas, can be presumed to be malnourished and the country will face serious food shortage if present production trend continues (Idachaba, 2006). Thus, attaining self sufficiency in food production is a major problem with the present condition of farm labour supply. Simmons (2004) succinctly stated that it is not possible to deal with food insecurity unless there is investment in agriculture and rural productivity increases drastically.

The solution to the problem of inadequate food production especially in the face of mounting population pressure rests on increased productivity through intensive use of land and other resources such as labour. It is necessary to produce more food and to produce more food, it is important to expedite action on labour force generation for rural agricultural production. Therefore, a proper examination of availability of labour in production of different food crops is necessary.

Tackling agricultural production problems is a prerequisite for increasing per capita food production of farmers. Adebowale (2000) opined that agricultural development programmes in recent years must give attention to solving world food problems. Oyemakinde (2000) also recommended that a nation's objective should remain as one of striving for self-sufficiency in agricultural production, promoting generation of agricultural surpluses for export and improving socio-economic welfare of farmers and rural people in general.

It is against this background that this study will attempt to proffer answers to the following questions.

1. What are the socioeconomic characteristics of farmers?
2. Is labour adequately available for food and tree crop production?
3. What are the factors that determine labour availability by farmers?

Objectives of the study

The specific objectives are to:

1. Identify the socioeconomic characteristics of food and tree crop farmers in southwestern Nigeria.
2. Assess labour availability for food and tree crop production.
3. Evaluate factors that determine labour availability for food and tree crop production in southwestern Nigeria.

Hypotheses of the study

The hypotheses of this study are as follows:

1. There is no significant relationship between selected socio-economic characteristics (sex, age, marital status, family size, educational level, primary occupation, number of farm, size of farm, years of experience, membership of farmers' association and residency) of farmers and extent of labour availability.
2. There is no significant difference in labour available for food and tree crop production.

Literature Review

Availability of labour in third world countries

Third world countries represent about 60 percent of planet's land area including most of the countries near and below the equator. More significantly, a larger percentage of the world's seven billion people live in the third world. These countries encompass primarily agrarian societies in which most people are poor and human labour is the most important input in traditional agriculture. However, demographic patterns and intra-rural migration in third world countries strongly influence availability of labour in smallholder agriculture. This in turn affects investment in agriculture in various regions. Areas with unattractive income and employment opportunities suffer a net out flow of population, creating labour shortages and economic stagnation.

Nevertheless, in rural regions of the third world, women have historically worked long hours, typically twelve hours a day. Much of women's work which are cleaning, cooking, gathering firewood, attending to the needs of children and travelling to and from market remain invisible to those who monitor labour force, besides, women involvement in almost all agricultural operations cannot be overemphasized (Gladwin and McMillan, 1989). Fapohunda (2012) also stated that women are the mainstay of rural production.

On the other hand, men dominate industrial and manufacturing jobs in most third world countries. Their impact is evident in third world cities where companies mostly engage them in development projects. Although unskilled labour is an important resource used for agricultural production, companies draw upon this resource for both construction and operational purposes, while only few are available for agricultural activities. Generally, third world countries produce labour intensive goods. Hardwick, Khan and Langmead (1994) defined labour intensive goods as goods that the ratio of labour to capital is high. With mere simple technology, third world countries are less productive by world standards.

Labour availability in Nigeria

In Nigeria, contemporary economic activities in Nigeria vary but they mainly include agriculture, manufacturing and tertiary occupation. Men continue to dominate labour market activities while female have been showing noticeable drop in their enthusiasm for wage employment until recently (Fajana, 2000).

Another area of the economy that has engaged more labour is the service sector. The service sector includes both formal and informal enterprise. Formal service sector are law offices, banks, travelling agencies, transportation, (air, rail and road), communication (newspaper, television and radio) and trade currency. Informal service sector consist of small-scale enterprises such as hairdressing, entertainers, porters, tailoring, auto-mechanics and traditional healers.

However, not all potential members of the working population in Nigeria present themselves for employment. Urban informal sector still absorb majority of labourers that could not secure employment in urban formal sector. And despite the fact that job insecurity is pervasive in urban formal and informal sector, under employment is high, wages are flexible and low, workers get very few benefits from their employers and receive little recognition under labour laws. Yet,

many prefer urban employment to rural employment where agriculture offers employment to many of the population.

Methodology

The study was conducted in southwestern states of Nigeria which lies between latitude 5°N and 9°N and longitude 20°E. It is bounded by the Atlantic Ocean in the south, Kwara and Kogi states in the north, eastern Nigeria in the east and Republic of Benin in the west. It has a land area of about 114,271km², representing 12 percent of the country's total land area. The zone has a population of 29.9 million and a population density of 195 persons/km (NPC, 2003).

Multi-stage sampling procedure was used to select respondents for the study. Oyo and Ondo states were selected from the states in southwestern Nigeria through simple random sampling technique. Also, random sampling technique was used to select 50% of the zones, 10% of the blocks, 25% of the cells and 10% of duly registered food crop farmers and tree crop farmers constituting 454 farmers. Data on socioeconomic characteristics and labor availability were collected through a structured questionnaire. Data were analyzed with descriptive and inferential statistics such as chi square, PPMC and Mann Whitney U test.

Results and Discussion

Table 1 presents the socioeconomic characteristics of the farmers. The result showed that male food crop farmers were 64.2 percent while female food crop farmers were 35.8 percent. Besides, 53.7 percent of the respondents were male tree crop farmers while 46.3 percent were female tree crop farmers. Most of the respondents were within the age range of 40-60 years and above and their mean age was 51.2 ± 13.1 . Majority (88.7%) of the farmers were married. The modal household size was three to five persons constituting 56.7 percent of the food crop farmers and 59.9 percent of the tree crop farmers. In addition, 39.2 percent of the food crop farmers and 47.2 percent of the tree crop farmers had no formal education. Agriculture was the major occupation of farmers though many still engage in other income generating activities.

Furthermore, most of the farmers (81.9%) had over 20 years of farming experience. They were mainly resident farmers who belonged to one farmers' association or the other. Generally, farmers were small and medium scale producers cultivate wide range of crops mostly in mixtures. Aside this, 49.2% food and 57.0% tree crop farmers had farm size of above 5ha. In

addition, 27.9 percent food crop farmers had two farmlands while 29.9 percent tree crop farmers had two farmlands.

Table 1: Socioeconomic characteristics of farmers

Variables	Food crop		Tree crop	
	Freq	%	Freq	%
Age				
<30 years	15	6.3	6	2.8
30-39	21	8.8	17	7.9
40-49	51	21.3	63	29.4
50-59	86	35.8	66	30.8
>60	67	27.9	62	29.0
Sex				
Male	154	64.2	115	53.7
Female	86	35.8	99	46.3
Marital status				
Single	15	6.3	5	2.3
Married	206	85.8	197	92.1
Divorced	11	4.6	7	3.3
Widowed	8	3.3	5	2.3
Household size				
3-5	136	56.7	126	59.8
6-10	80	33.3	69	32.2
>10	9	3.8	10	4.7
Dependants				
1-5	178	74.2	175	81.8
6-10	12	5.0	4	2.8
>10	-	-	-	-
Education				
No formal	94	39.2	101	47.2
Primary	82	34.2	79	36.9
Secondary	41	17.1	23	10.7
Tertiary	23	9.6	11	5.1
Number of farmlands				
1	139	57.9	126	58.8
2	67	27.9	64	29.9
3	34	14.2	24	11.2

Farm size				
<2ha	30	12.5	3	1.4
2-5ha	92	38.3	89	41.6
>5ha	118	49.2	122	57.0
Years of experience				
<10 years	9	3.8	29	13.6
11-20 years	21	8.8	23	10.7
21-30 years	116	48.3	103	48.1
31-40 years	94	39.2	43	20.1
41-50 years	-	-	10	4.7
>50 years	-	-	6	2.8
Membership of farmers' association				
Farmers' cooperative	133	55.4	95	44.4
Credit and thrift	48	20.0	70	32.7
Both	-	-	14	6.5
None	59	24.6	35	16.4
Residency				
Absentee farmer	24	10.0	23	10.7
Migrant farmer	13	5.4	19	8.9
Resident farmer	144	83.2	172	80.4

Source: Computed from field survey, 2011.

Table 2 and figure 1 present labor availability of food and tree crop farmers. Majority (90.0%) of the food crop farmers indicated that they did not have enough labor. Only 8.8 percent have adequate labor for production while 1.3 percent did not have labor at all. Similarly, many (73.4%) tree crop farmers did not have enough labor for production activities. Only 11.7 percent of the tree crop farmers have adequate labor for production while 15 percent did not have labor at all.

This correlated the findings of Echebiri and Mbanasor (2003) that human labor is the only form of labor available to smallholder farmers in Abia state. Yet, in Abia state, rural farm population constituted only 16 percent of total active labor force in Nigeria. They also attributed non availability of labor for farm work in Abia state to increasing absence of people within active farm working age due to farm drudgery, inadequate social infrastructure and general slow life expectancy in rural societies.

Besides, labour input per hectare varies for different cropping system. Yet, labor is not available for all crops making some to be more labor constrained compared to others. And within production season, some activities are more labor constrained than others. However, future labor availability can be ensured only if a reliable and dependable pool of local labor is created (Johnson, 1990).

Table 2: Distribution of farmers' labor availability

Level of labor available in last growing season	Oyo				Ondo				Total			
	Food Freq	%	Tree Freq	%	Food Freq	%	Tree Freq	%	Food Freq	%	Tree Freq	%
Adequate labor	12	6.9	17	14.0	9	13.4	8	8.6	21	8.8	25	11.7
Some, but not enough	159	91.9	89	73.5	57	85.1	68	73.1	216	90.0	157	73.4
I do not have at all	2	1.2	15	12.4	1	1.5	17	18.3	3	1.3	32	15.0
Total	173	100	121	100	67	100	93	100	240	100	214	100

Source: Field survey, 2011.

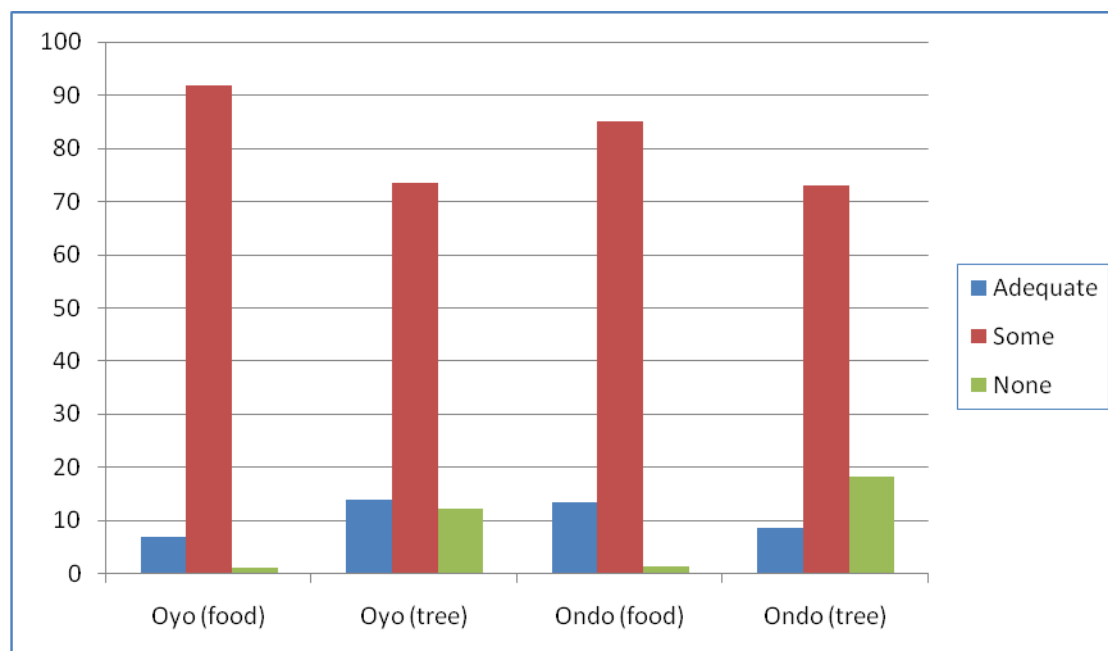


Fig 5.1: Farmers' distribution of labour availability

Hypothesis 1(H₀₁): There is no significant relationship between the socio-economic characteristics (sex, age, marital status, family size, education level, primary occupation, farm size, number of farm, years of experience, farmers association and residency) and extent of labor availability of food and tree crop farmers in southwestern Nigeria.

Chi-square was used for data at nominal and ordinal level while PPMC was used for data at interval level. Chi-square was used to test the relationship between farmers' socio-economic characteristics (sex, marital status, educational qualification, occupation, farmers' association and residency) and labor availability. PPMC was used to test relationship between farmers' socio-economic characteristics (age, family size, number of farm, size of farm, and years of experience) and labor availability.

Table 3 shows that marital status ($\chi^2 = 20.00, p \leq 0.05$) and education ($\chi^2 = 17.41, p \leq 0.05$) of food crop farmers are significantly related to labor availability. This result implies that educated farmers are likely to give their children and wards education and send them to school. Therefore, they will need labor for farm operations that their children and ward normally do. Findings of Echebiri and Mbanasor (2003) also revealed that level of education had a positive influence on adult household equivalent labor supply.

In addition, Table 3 shows that sex ($\chi^2 = 48.30, p \leq 0.05$), farmers association ($\chi^2 = 15.80, p \leq 0.05$) and residence ($\chi^2 = 12.54, \leq 0.05$) of tree crop farmers are significantly related to labor availability. Plausible reason for the relationship between sex and labor availability of tree crop farmers could be the fact that there was gender specialization in tree crop production. Echebiri and Mbanasor (2003) in their findings further established a strong causal relationship between socio-economic characteristics of household and labor supply. Married farmers will easily receive assistance from family members to work on the farm. Various farm operations are completed quickly as compared to an unmarried farmer who may need to hire labor to undertake some task. In addition, Enete and Okon (2011) confirmed that sex of household head significantly but negatively affected production and it favored food crops such as yam and cassava.

Table 3: Chi-square result of the relationship between farmers' socio-economic characteristics and labor availability.

Variable	Chi-square value	Degree of freedom	P value	Decision
Food crop farmers				
Sex	1.302	2	.522	N.S
Marital status	20.001	6	.003	Sig.
Education	17.413	6	.008	Sig.
Occupation	8.247	6	.221	N.S
Farmers' association	3.340	2	.188	N.S
Residency	8.321	4	.080	N.S
Tree crop farmers				
Sex	48.296	2	.000	Sig.
Marital status	4.257	6	.642	N.S
Education	3.728	6	.713	N.S
Occupation	7.992	6	.385	N.S
Farmers' association	15.804	4	.003	Sig.
Residency	12.541	4	.014	Sig.

Source: Computed from field survey, 2011.

The result of Pearson product moment correlation presented in Table 4 shows the relationship between socio-economic characteristics (age, family size, number of dependants, number of farm, farm size and years of experience) and extent of labor availability of food crop farmers. Table 4 also shows the relationship between number of farms ($r=0.230$, $p \leq 0.01$) and size of farm ($r=0.173$, $p \leq 0.01$) of food crop farmers and labor availability. However, Emerole (2012) documented a negative but significant influence of large farm size and experience in farm work on household labor supply. In addition, there was a relationship between number of farm of tree crop farmers ($r=0.310$, $p \leq 0.01$) and labor availability. Moreover, the result further reveals that family size ($r=.139$, $p \leq 0.05$) and years of experience ($r=0.159$, $p \leq 0.05$) of tree crop farmers have significant relationship with labor availability.

Table 4: Pearson product moment correlation (PPMC) of socio-economic characteristics of farmers and labor availability.

Variables	Age	Family size	Number of dependants	Number of farms	Size of farms	Years of experience	Labor availability
Food crop farmers							
PPMC	.111	-.042	.102	.230**	.173**	-.093	
Sig 2-(tailed)	.086	.515	.116	.000	.007	.150	1.00
N=240							
Tree crop farmers							
PPMC	-.069	-.139*	-.037	.310**	.119	-.159*	
Sig 2-(tailed)	.318	.042	.539	.000	.082	.020	1.00
N=214							

Source: Computed from field survey, 2007

** Correlation is significant at 0.01 level (2-tailed)

*Correlation is significant at 0.05 level (2-tailed)

Hypothesis 2

Ho:2 There is no significant difference in labor availability for food and tree crop production in Oyo and Ondo states.

Result of Mann-Whitney U test in Table 5 shows significant difference in labor availability of food crop farmers in Oyo and Ondo states ($z=-4.38$, $p \leq 0.05$). Similarly, the result also shows significant difference in labor availability of tree crop farmers in both states ($z=-4.75$, $P \leq 0.05$). But there was no significant difference in labor availability of pooled food and tree crop farmers in Oyo and Ondo state ($z=-1.79$, $p \geq 0.05$). The result shows that farmers generally need and seek labor for production activities. But the amount of labor required, time of the year when labor is needed and length of time for which labor was needed for food and tree crops differs.

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Table 5: Mann-Whitney U test of labor availability for food and tree crop production

States		N	Mean Rank	Sum of ranks	MWu	W-	Z	P	Decision
Food Crops	Oyo	173	111.79	19339.00	4288.00	19339.00	-4.38	0.00	Sig.
	Ondo	67	143.00	9581.00					
	Total	240							
Tree Crops	Oyo	121	93.90	11362.50	3981.50	11362.50	-4.75	0.00	Sig.
	Ondo	93	125.19	11642.50					
	Total	214							
Pooled									Not sig.
Food crop		240	235.25	56461.00	23819.0	468.24	-1.79	0.07	
Tree crops		214	218.80	468.24					

Source: Computed from field survey, 2011

Regression analysis

Table 6 shows that number of farms, membership of farmers' association/organization, residency, labour migration and location were significant predictors of labour availability. Regressors included in the model accounted for 73 percent variance of labour availability of food crop farmers. In addition, the regressors accounted for 52 percent of the variance of labour availability for tree crop production ($p < 0.05$). This shows that significant causal relationship existed between the dependent and independent variables.

Significant predictors of labour availability were farmers' association ($\beta = -0.055$), labour migration ($\beta = -0.086$) and residency ($\beta = -0.121$) of food crop farmers. Simonya and Obiakor (2012) also found that membership of cooperative society was significantly related to household labour use. This result further corroborated Ogundele's (2005) findings that labour productivity in agriculture has been stagnated due to labour out migration from agriculture that has been significant in recent times. On the other hand, the only significant predictor of labour availability of tree crop farmers was residency ($\beta = -0.334$).

Table 6: Regression analysis on determinants of labour availability for food and tree crop production

Crop model	Unstandardized B coefficient	Standard error	Standardized B coefficient	T	Sig.
Food crop (constant)	3.607	.465		7.751	.000
Association/organization	-.906	.114	-.055	-7.947	.000
Residency	-.501	.114	-.121	-4.073	.000
Number of farms	.003	.081	.007	.032	.975
Location of farm	.304	.332	.075	.917	.360
Labour migration	-.044	.123	-.086	-.530	.000
Tree crop (constant)	-.529	.399		-1.325	.196
Association/organization	.044	.083	.086	.528	.603
Residency	-8.865	2.328	-.334	-3.791	.004
Number of farms	.115	.090	.223	1.267	.218
Location of farm	-.452	.377	-.094	-1.199	.232
Labour migration	-.372	.083	-.017	.248	.804
Food R = .732	R ² = .536		Adjusted R = .409		
Tree R = .526	R ² = .277		Adjusted R = .206		
F = 4.235 (Food)	F = 3.902 (Tree)				

Conclusion and recommendation

The cardinal aim of rural development is to encourage rural dwellers to produce surplus food and fibre over above their own need. In order to achieve this, there is need to bridge the gap between urban and rural areas in terms of distribution of social amenities. This is important because labour availability is intricately linked with nexus involving wage rate as well as availability of social infrastructure. Hence, there is need to prepare national policies to foster development in rural areas. Adequate provision of improved services and rural infrastructural facilities notably rural electricity, health services and good road will increase labour availability for rural agricultural production and reduce rural-urban labor migration

Government should enact and formulate agricultural policies that will focus on the efficient producers (small scale farmers) of varying farming system. This will involve formulation and implementation of idealistic, practical and developmental goals towards generation and use of labour. This is necessary as there are yet many untapped potentials in rain fed agriculture prevalent in rural areas of Nigeria where bulk of human and natural resources are located.

Besides, there is need for agricultural production system that will ensure production of maximum quality of utilizable product.

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