AN ASSESSMENT OF LABOUR DAILY WAGE RATE FOR AGRICULTURAL PRODUCTION ACTIVITIES IN THE NORTH CENTRAL ZONE, NIGERIA

*Akintobi O.S, Ajah Julius, Idu E. Edwin

Department of Agricultural Extension and Rural Sociology, University of Abuja, Nigeria.

*Corresponding Author's Email: akintobiolanrewaju@gmail.com +2347088246184

ABSTRACT

The study evaluated small-scale farmers' access to human labour in North Central Nigeria. Multi-stage random sampling technique was used for sample selection while questionnaires were used for data collection. A total of 1,750 farmers were randomly interviewed. Data were analyzed using descriptive statistics and two-way mixed factorial analysis of variance and mean separation was done at 5% probability level. Result revealed labour wage per rate significantly ($P < 0.05$) dependent on the labour category, the location (state) and the effect of both human labour type and location (state). Mean separation showed adult male is the highest paid while young female is the least paid, while Kwara State has the highest labour wage rate and plateau State has the lowest wage rate per day. Based on the findings, the research concluded that small scale farmers access to labour based on wage rate is low, cost of agricultural labour is high which has resulted increased cost of production for the small-scale farmers. The study recommends among others that combine hiring should be encouraged among farmers for the adoption of expensive labour saving technologies/ implements.

Keywords: Small Scale farmers, labour, Access, Wage rate.

INTRODUCTION

Labour is a key factor of production which can either be family or hired, labour is the group of productive service provided by human physical effort, skill, and mental power. It is the work input of people- not the people themselves (Panwal, 2017). Labour is the tool with which capital and managerial skills are used to extract profit from the land. Labour input is usually measured in man- days or sometimes man-hours, which represent the input of work of an average man in a working day or hour, Efficiency of labour use as a production factor is expressed by the level of labour productivity which is the technical efficiency of human work utilized in creation of useful goods. Achieving increases in agricultural production requires increasing labour-use efficiency, intensification of use of land and expansion of indigenous technology (Panwal, 2017).

According to Nmadul and Akinola (2015), labour plays important economic and social roles in any economy and that human labour is about the only form of farm labour available to farmers and farmers contribute over 80% of total domestic agricultural output, it therefore means that, human labour accounts for domestic food supplies in Nigeria. Therefore, the hope to continue to supply the food need of the ever-growing population anchors very auspiciously on human labour productivity. Yeboah and Jayne (2016) claimed human labour is about the only main source of labour accessible to small-holder farmers in Nigeria. Hired labour contributes 88.0% of the total labour use on farms thus emphasizing its importance in agricultural activities. Other types of labour that could be employed are family labour and exchange labour. Researchers like Nmadu and Akinola (2015) on farm labour supply have observed that total supply of labour depends on such factors such

as the size of the population, its age composition and certain institutional factors.

The sharp decline in labour supply for agricultural production in the country is attributed to a host of factors such as rural-urban migration, increase enrolment in school, increased employment opportunities accompanying industrialization, urbanization as well as increased off farm employment. Because of the increased participation of labour in off-farm activities which culminated in scarcity of farm labour and rising labour wage rate, there is great fear that agricultural growth and development may be retarded and our whole effort of achieving self-sufficiency in food crop production would be a mirage (Christiaensen, Sheahan and Shimeles, 2017). The study therefore evaluated small scale farmers' access to labour in North Central Nigeria. The specific objectives were to:
1. Determine the labour wage rate per day in each State
2. Determine the wage rate per day for each labour category
3. Determine the wage rate per day in each State

The Hypothesis of the study states that

H_o: Wage rate per day does not depends on the State where the farmer lives (location), the type of labour input desired by the farmer and both location and labour input-type.

MATERIALS AND METHOD

The study was carried out in the North Central Zone of the Nigeria. It is one of the six geo-political zones in the country, the population of the study consists of all small-scale farmers in selected communities in the north central region of Nigeria. Five States were randomly selected out of the 7 States in the zone.

Multi stage random sampling was used to select determine the

sample size. In the first stage, three (3) agricultural zones was selected from each of the States while in the second stage six (6) agricultural extension blocks from each of the agricultural zones was randomly selected giving a total 18 blocks. In the third stage, 5 cells were randomly selected from each of the 18 agricultural extension blocks resulting in a total of 90 cells. Finally, in each of the 90 cells (fourth stage), 4 farmers were randomly selected and interviewed giving a total of 360 respondents from each of the States. In total 1,800 respondents from the five north central States was interviewed for this study.

Data collected was subjected to descriptive statistics while two-way ANOVA was used to test the relationships that exist between the variables in the hypothesis.
It is mathematically expressed as:

$$Y_{ijkt} = \mu + S_i + L_j + SL_{ij} + e_{ijk} \ldots\ldots\ldots\ldots\ldots\ldots\ldots.\ldots 1$$

Where:
Y_{ijk} = Wage rate paid to each of the labour types per day work.
- i denotes the level of factor S
- j denotes the level of factor L
- k denotes the kth observation in cell or treatment (ij)
μ = population mean
S_i = This measures the main effect of location (State) on access to labour input. That is, differences in access to labour input due to location (Plateau, Niger, Abuja, Kwara, Nasarawa States).
L_j= labour input – This measure the main effect of labour categories. That is, differences in access to labour due to its nature (adult male, adult females, young males and young females)
SL_{ij} =interaction between location (State) and labour input type
e_{ijk} = error term

The model is a two-way mixed analysis of variance (ANOVA). Here, there are two factors of interest – location (state) and labour category. Labour category or labour type was measured repeatedly hence it is called *"within factor variable"* and it has four (4) levels namely: adult male, adult females, young males and young females. State (location) is a "*between factor variable*" and has 5 levels (Plateau, Niger, Abuja, Kwara, Nasarawa States). The model States or hypothesizes that labour daily wage rate for agricultural production activities in the study area (Y_{ijk}) depends on the state (location) where the farmer hires the labour (S_i), the type of labour hired by the farmer (L_j) and both location and labour type (SL_{ij}), The μ is the population mean which has no effect on the scores obtained and does not contribute to any variation in the observed differences (Aggarwal, 2002). The error term is given by e_{ijk}. SPSS 21.0 was used to run the analysis and mean separation was done using LSD model (Field, 2005). It was tested at 5 percent probability level.

RESULT AND DISCUSSION
Socioeconomic Characteristics of Respondents
Results in Table 1 show that small scale farmers in North Central Nigeria are between the ages 30 and 50 years, they are young and active adults and if proper inputs are set in place,they can produce more from their present production rate.This study correlate with the research of Akintobi, Evinemi and Achagwa (2018) which stated that most of the farmers in North Central Nigeria are agile and in their productive ageswho are active in arable crop production and have potential drive to sustain agricultural production for many years. The educational status reveals that small scale farmers in North Central Nigeria are educated. These results imply that level of awareness and adoption of agricultural innovations among the farmers would be very high. Literate farmers are expected to be more innovative because of their ability to obtain and comprehend information more quickly and their ability to take more risk. Bawa, Donye and Nuhu (2010).

The years of farming experience accrued by the farmers shows that over 70% of the farmers have more than 10 years of farming experience, this result reveals small scale farmers in the study area have considerable years of farming experience. This is in line with Apata (2010) who stated that farmers who have an experience of over ten years are no more novices in agricultural production. The gender status result which reveals majority of the farmers are male, this reveals from the table that male is actively involved in farming activities in the study area which tends to increase agricultural production because of their strength and energy. This also corroborate with Akintobi *et al* (2018) who implies that gender is a significant factor in agriculture because of its vital role in determining farming activities, and this could influence the adaptive capacity to employ various indigenous agricultural methods.

Table 1 further present the marital status of the respondents showing 85.2% of the respondents are married. It reveals that most of the respondents still kept their marriage as a moral value of the rural communities while some farming households keeps their marriage as a means of combating food insecurity (Aphunu and Nwabeze, 2012). The household size of the farmers and it reveals the number of family members who are currently living in the same physical building with the head farmer and are dependent on the farmer for food and basic needs. The data reveals the farming households are large with more than 60% of the respondent's household size above 6 persons.

Table 1: Socio-Economic Distribution of Respondents

Variables	Frequency (n= 1750)	Percentage
Age of the farmers (years)		
≤ 30	234	13.4
31 -40	463	26.4
41 -50	669	38.3
50 – 60	255	14.5
>60	129	7.4
Educational status		
No formal education	392	22.4
Primary school	431	24.6
Secondary school	565	32.3
Post- secondary school	362	20.7
Years of farming experience		
≤ 10	409	23.4
11 -20	497	28.4
21 – 30	475	27.1
30 – 40	286	16.4
>40	83	4.7
Gender		
Male	1056	60.3
Female	694	39.7
Marital Status		
Single	139	7.9
Married	1491	85.2
Divorced	57	3.3
Widowed	63	3.6
Household Size		
<5	546	31.2
6 – 10	875	50
10 - 15	278	15.9
>15	51	2.9

Source: Field Data Analysis, 2021

Test of Hypothesis

Table 1 shows the results of the two-way mixed analysis of variance (ANOVA) done to determine the access to human labour as a result of the average wage rate per day The results indicated that the average wage rate per day significantly ($p < .05$) depended on the labour type (Adult male, adult female, young male, young female), location of the small scale farmer in term of State (Plateau State, Nasarawa State, Federal Capital Abuja, Niger State and Kwara State) and the interaction effect of human labour type and location (State).

The result showing how the farmers generally rated the labour wage rate for each labour category. Here, emphasis is not on the location (State) of the farmer but on the category of (nature) of

labour with the highest wage rate per day. The question is thus asked: Irrespective of location where the famers reside (state in the North Central Nigeria), do wage rate per day of human labour depends on the category of the labour? It tests the hypothesis which states that wage rate per day of human labour does not significantly depend on the category of labour. That is, $\mu_{adult\ male} = \mu_{adult\ female} = \mu_{young\ male} = \mu_{young\ female}$.

The result, $F(3, 5235) = 734.91$, $p = 0.00$, indicated that the wage rate per day of human labour significantly depended on the category of human labour hence the null hypothesis was rejected. Mean separation as shown in (fig. 3) indicated that the most paid labour category was adult male. This could be as a result of experience which adult male has gathered over the years and the ability to do strenuous work than any other labour category.

The result showing the wage rate per day of the labour categories based on the location (state) - the main effect of location (State) on the wage per day rate. Here, emphasis is placed on the human labour location (State) not on the labour category. The question state thus: Do wage per day rate of labour categories in different location (State) differs significantly? It tests the hypothesis which states that human labour wage rate per day does not depend on location (State) in which it resides ($\mu_{Plateau\ State} =$ $\mu_{Nasarawa\ State} = \mu_{Abuja} = \mu_{Niger\ State} = \mu_{Kwara\ State}$). The result, $F(4, 1745) = 10.70$, $p = 0.00$, shows that there was a significant ($p < .05$) relationship between the wage rate per day of the labour categories and the location (state) in which they reside, hence the null hypothesis was rejected. Mean separation as shown in (Figure. 2) revealed that Average wage per day rate is highest in Kwara State which means that Small Scale farmers in Kwara State paid higher wage rate per day among the five States in North Central Nigeria.

The interaction between labour category and location (State) (labour category*location (state)). Here, the question states thus: is the average wage per day rate for each of the labour categories the same in each of the location- state? It tests the hypothesis which states that there is no significant interaction effect of average wage rate per day for labour categories and the location (State). That is, ($\mu_{adult\ male\ in\ Plateau\ State} = \mu_{adult\ male\ in\ Nasarawa\ State} = \mu_{adult\ male\ in\ Abuja}\ldots\ldots = \mu_{young\ female\ in\ Kwara\ State}$).

The result, $F(12, 5235)\ 31.61$, $p = .00$, showed that there was significant (($p < .05$) interaction effect between average wage per day rate for all the labour categories and the location (State) in which they reside. resulting in the rejection of the null hypothesis.

Table 3: ANOVA result on farm labour wage rate per day work

Sources of variation	Df	SS	MS	F-cal	*P*-value
Labour type	3	481616522.86	160538840.95	734.91	.00
Labour type*State	12	82851523.57	6904293.63	31.61	.00
Error (within factor)	5235	1143565703.57	218446.17		
State	4	8155736.25	2038934.06	10.70	.00
Error (between subjects)	1745	332604434.82	190604.26		

Source: Field Data Analysis, 2021

Significance level = 5%

Wage Rate per Day for each Labour Category (Irrespective of State)

Figure 1 showed the average wage rate per day for each labour category (ireespective of State), the result reveals adult male rakes home ₦1,530 on an average daily, adult female receives an average ₦1,184 daily for farm activities, young male who are not as experienced as the adult male receives on average ₦1,082 daily from while young female were paid ₦797 daily on average. This result has shown that adult male were well remunerated daily and this could be to the fact that they are well experienced in agricultural production would need less supervision and men are regarded as stronger to do the strength intensive activities on the farm and adult female came short of levelling with adult male by over ₦346 equivalent of a dollar, adult female engage mostly in the processing aspect of agricultural production even though they are experienced workers ensuring value addition to production doesn't seem equivalent to the actual farm production of the agricultural goods hence they difference in wage rate for both adult male and adult female respectively.

Young male receives a little less to the adult female with a difference of ₦102, the young males are considered male labourer who falls within those set of labour within the range of 18-30years who are less experienced and do not possess the same physical strength as the adult male. These young males will require supervision and are mostly serves as a supporting role for the adult male on the farm this also reduces the cost of hiring labour for most small-scale farmers. The young females are the least paid labour in agricultural production the difference of payment between young female and adult male is ₦733, while the difference with adult female is ₦387. Young female falls in

the same age range with young male and they as well serve as support for the adult female in agricultural crop processing and or light activities in the farm.

Olakojo (2016) research buttresses this result when he stated that there are gender disparities in farm labour market with male farm employees having higher employment, wages and engaged for a longer period of time than female farm employee.
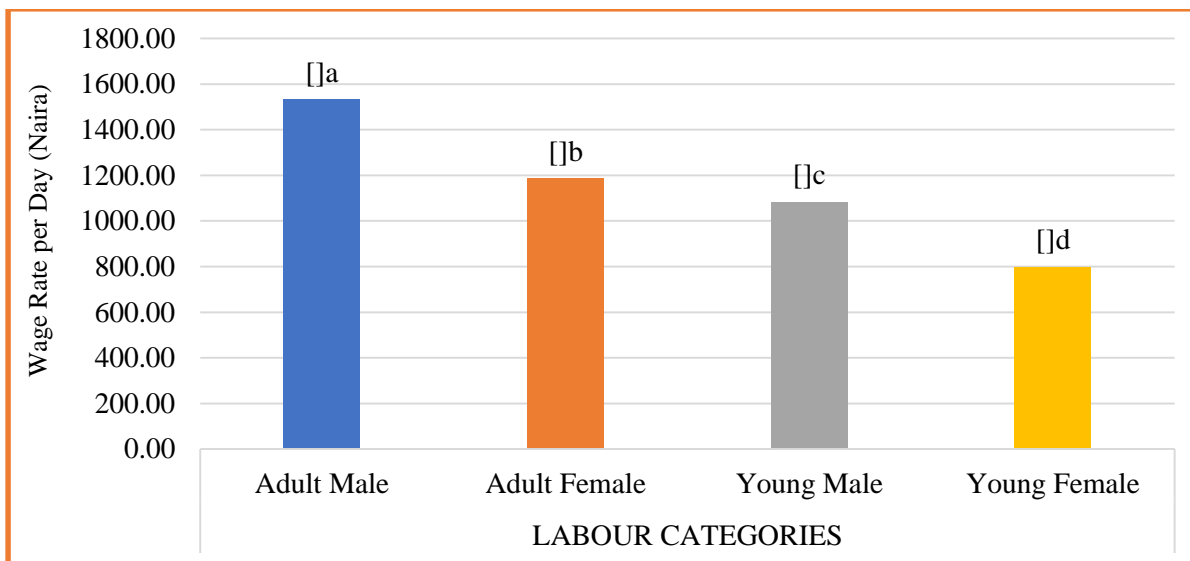
Fig 1: Average wage rate per day for each labour category
Note: Means with the same alphabet do not significantly differ from each other
Source: Field Data Analysis, 2021

Labour Wage Rate per Day in each State (Irrespective of Labour Category)

Fig 2 reveals the average labour wage rate per day in each state (irrespectibe of labour category) the data showed Kwara State showing the highest average wage rate of ₦1,230 among the State, while Abuja the federal capital showed ₦1,175, as the second highest State with an average wage rate per day Niger State that has a good access to human labour had an average ₦1,161, Nasarawa showed a very low average wage rate per day of ₦1,153 compared to Kwara State and plateau State reveals the lowest wage rate per day at ₦1,023 regardless of labour category. This result shows that Kwara and Abuja State small scale farmers paid the highest for labour on their farm, while Nasarawa and Plateau State paid the lowest for labour wage rate per day on their farms This result correlate with price and supply principle, which state that price of a commodity in this case human labour increase with decreasing supply of that commodity. When there is scarcity or a low supply of that commodity the price for that commodity increases. This can be said of Kwara state and Abuja as the result from the access to labour showed that both states had the lowest access to labour,

However, the average wage rate per day of these States showed the highest. This means that as the access to labour is low, small scale farmers had to pay more to hire the already few labourers on the farm. Niger State showed an averagely good wage rate regardless even when the farmers had good access to labour while Nasarawa and Plateau States result showed that both States paid the lowest lowest wage rate per day for any labour. The result further revealed there was no significant difference ($p < .05$) between Niger State and Nasarawa State but have a higher average labour wage rate per day compared to Plateaus State.
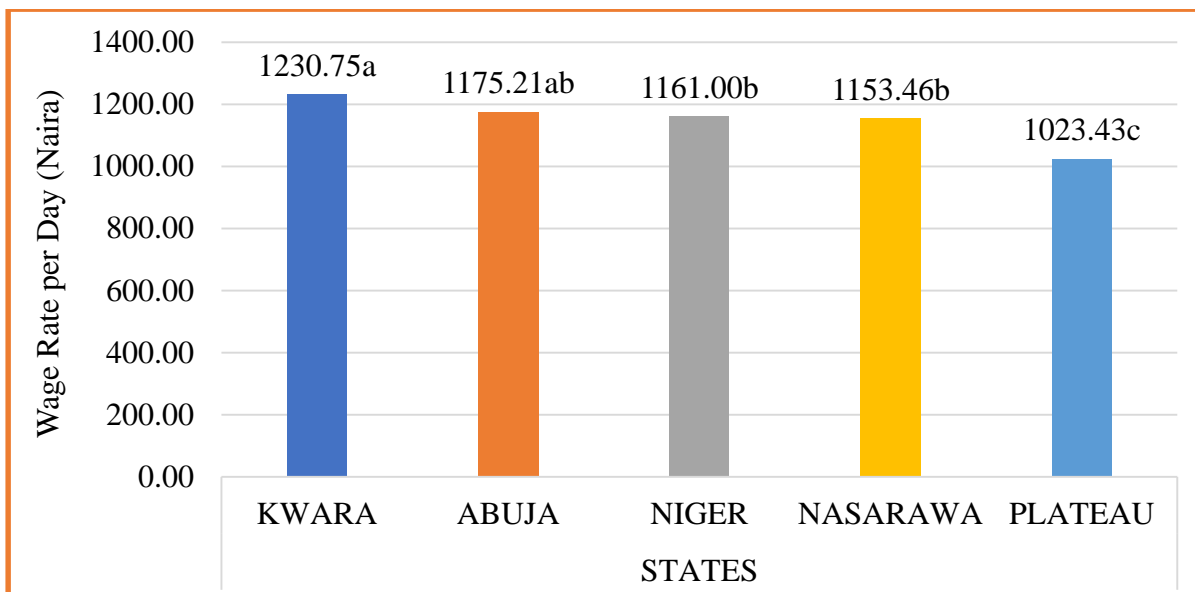
Fig 2: Average labour wage rate per day in each State
Note: Means with the same alphabet do not significantly differ from each other
Source : Field Data Analysis, 2021

Labour Wage Rate per Day in Plateau State.
Fig 3 reveals the labour wage rate in Plateau State, the mean wage in the State showed that Adult male receives the highest, followed by the young male who receives more than adult female, this showed that young male are considered more valuable to agricultural production activities than the adult female. The result further reveals young female being the least remunerated. This result showed male dominated activities which are strength engaging activities are dominant in Plateau State as more men are needed to carry out these activities which make young male to be more enumerated than adult female.

Agwu et.al (2013) supported this claim according to their research, they claimed male gender is actively involved in strength engaging activities while the female are involved in mostly processing aspect of agricultural production.
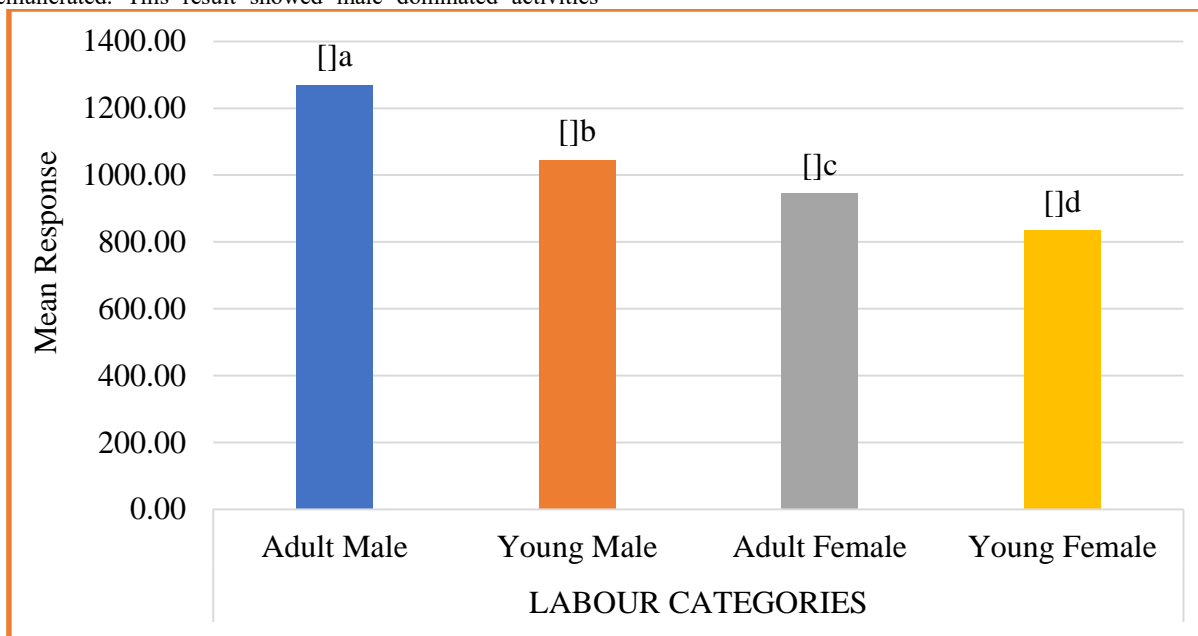

Fig 3: Average labour wage rate per day in Plateau State
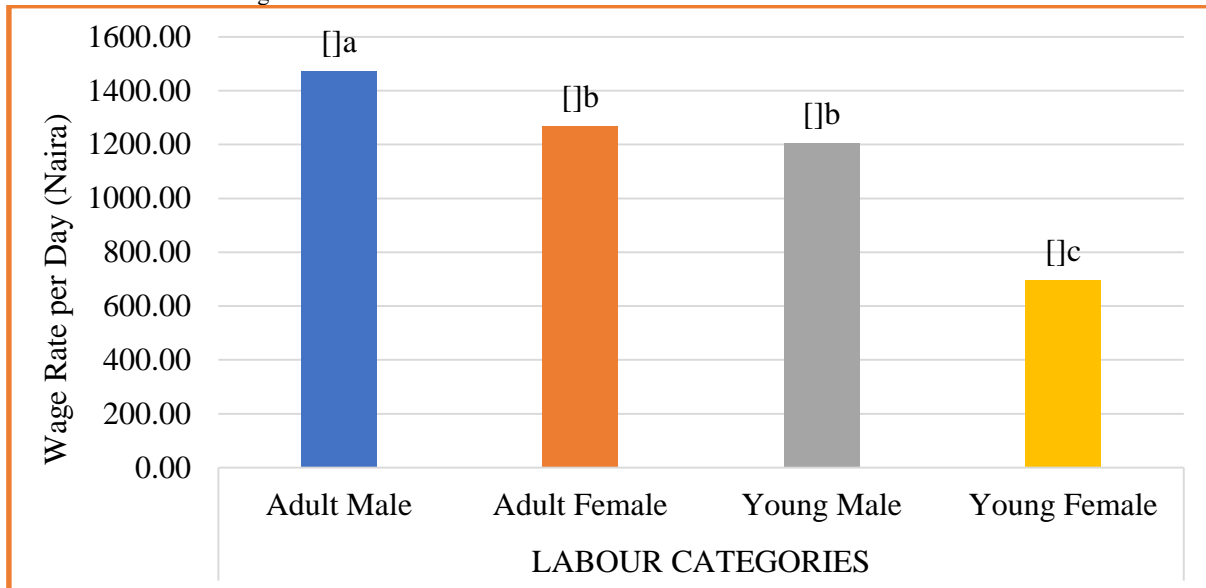**Note:** Means with the same alphabet do not significantly differ from each other
Source: Field Data Analysis, 2021

Labour Wage Rate per Day in Niger State.
Fig 4 showed the average labour wage rate per day in Niger State, this result reveals that adult male is the most remunerated in the State, adult female comes second while the young male

comes third, the study reveals there was no significant difference ($p < .05$) in average labour wage rate per day between the young male and adult female in Niger State. The result further reveals that the young females are the least remunerated.
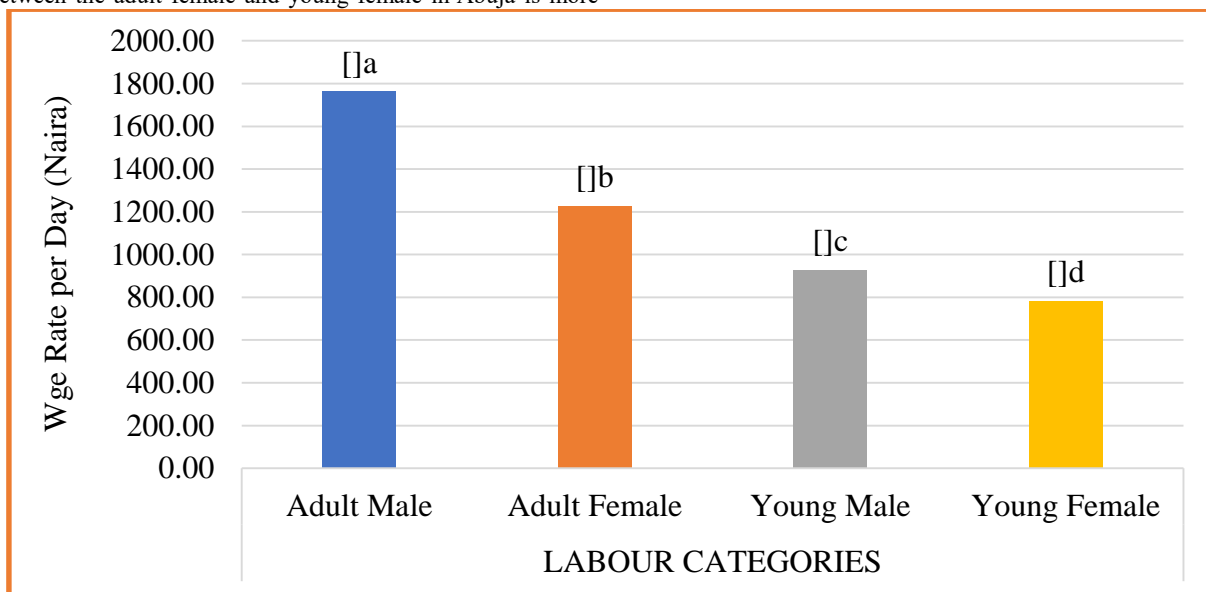

Fig 4: Average labour wage rate per day in Niger State
Note: Means with the same alphabet do not significantly differ from each other
Source: Field Data Analysis, 2021

Labour Wage Rate per Day in Federal Capital Abuja
Fig 5 reveals the average labour wage rate per day in the federal capital Abuja, this result showed that Adult male receiving the highest wage, the young female is paid the lowest, The margin between the adult female and young female in Abuja is more than double. The huge difference in the wage rate per day among the adult category and the young category might be as a result of the young male and female actively involved in education in the study area.
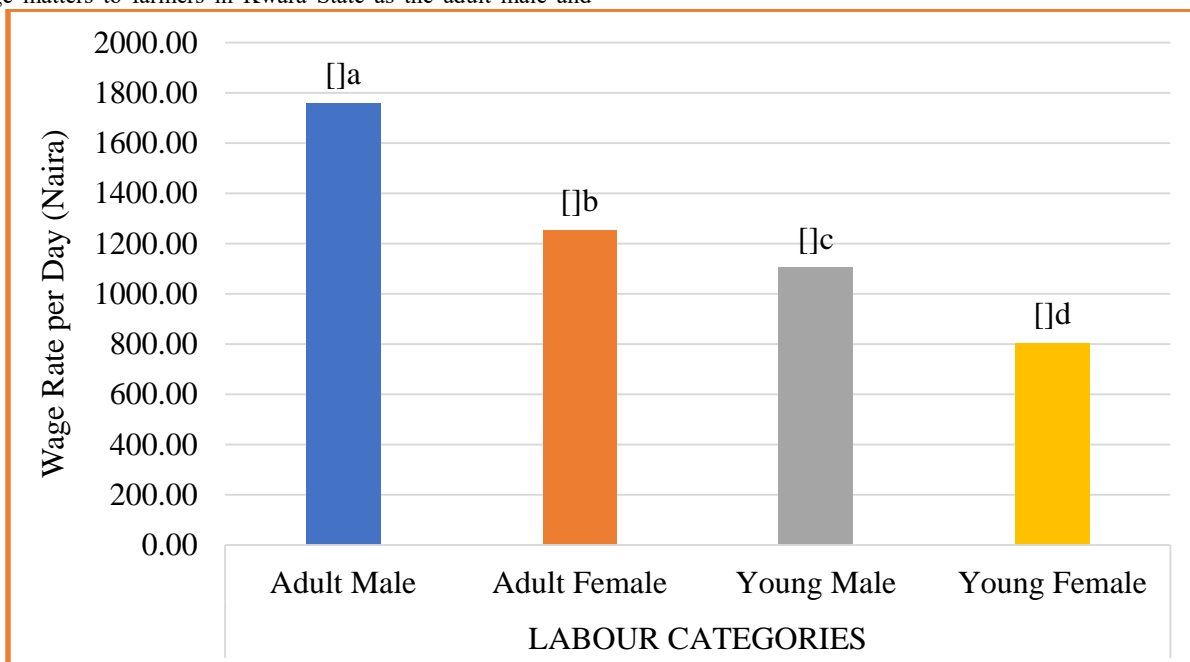

Fig 5: Average labour wage rate per day in Abuja, Nigeria
Note: Means with the same alphabet do not significantly differ from each other
Source: Field data analysis, 2021

Labour Wage Rate per Day in Kwara State
Fig 6 shows that average labour wage rate per day in Kwara State, this followed the same pattern with other State except Plateau State, the adult male is highly paid than any other labour category followed by adult female. The young male who are less experienced than the adult are paid ₦1,104 for labour activities on the farm while the young female who fall in the categories of youthful inexperienced female are paid ₦804 per day on the

farm in Kwara State. This result has shown that experienced and age matters to farmers in Kwara State as the adult male and female are better remunerated than the younger male and female.
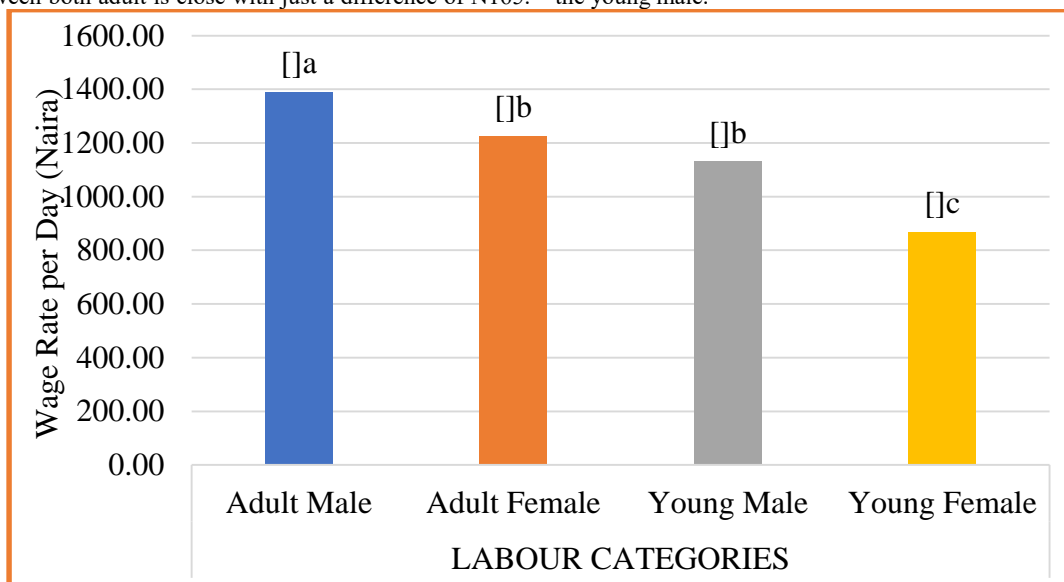

Fig 6: Average labour wage rate per day in Kwara State
Note: Means with the same alphabet do not significantly differ from each other
Source: Field Data Analysis, 2021

Labour Wage Rate per Day in Nasarawa State
Fig 7 reveals the average labour wage rate per day in Nasarawa State, the result reveals a close difference in the daily average wage rate for all the labour categories, the adult male receives ₦1,389 daily on the farm as the remuneration for a day work, this is followed by adult female who receives on average ₦1,225 as the average labour wage per day in Nasarawa State, the wage rate between both adult is close with just a difference of ₦165.

The young male followed with a daily remuneration of ₦1,131, the study reveals there was no significant difference ($p < .05$) in average labour wage rate per day between the young male and adult female. The young female wage rate per day is ₦867. This state showed a close wage rate amongst the labour categories and may be due to the farmers seeing each labour categories as much as important as the other especially the adult female and the young male.

Fig 7: Average labour wage rate per day in Nasarawa State
Note: Means with the same alphabet do not significantly differ from each other
Source: Field Data Analysis, 2021

CONCLUSION AND RECOMMENDATION

It is evident that the small-scale farmers in North Central Nigeria pay more for labour compared to their capital capacities, level of experience is a basis for a higher labour wage rate per day in North Central Nigeria. This reveals that small-scale farmers pay higher wage rate per day in states which they perceive the lowest access to human labour. As perception of lack of access to labour increases the average wage rate per day also increase. It is therefore recommended that farmers should be encouraged to organize themselves into cooperative societies as to be able to engage in share labour and have access to farm resources to improve labour use efficiency and productivity. Also, the imperfection in wage rate per day between adult male and adult male should be addressed given that agricultural sector employs most women in rural Nigeria.

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