African Journal of Economics and Sustainable Development
ISSN: 2689-5080
Volume 3, Issue 3, 2020 (pp. 88-108)
www.abjournals.org

DISAGGREGATION AND DETERMINANTS OF TIME ALLOCATION AMONG WOMEN IN RURAL OYO STATE, NIGERIA

Amao Olufunmilola[1] and Adenegan Kemisola O.[2]

[1]Agricultural Extension and Management Department, Oyo State College of Agriculture and Technology, Igboora, Nigeria.

[2]Professor, Agricultural Economics Department, University of Ibadan, Nigeria.

Emails: amaoolufunmi@yahoo.com, bumkem@yahoo.com

ABSTRACT: *Women shoulder work shifts between paid and unpaid work hence their time is constrained. There is much within-group inequality in time allocation which masks high levels of inequality within each gender group and therefore, this study examined the determinants of time allocation among rural women in Oyo State. A Four-stage sampling procedure was used in the collection of primary data with purposive selection of two Agricultural Development Programme zones in Oyo state of Nigeria. Structured questionnaire and interview schedule were used to analyse data from 160 respondents using descriptive statistics and Tobit regression at* $\alpha_{0.05}$*. The result revealed that a unit increase in educational level increased time spent on paid job and being married increased time for paid job by while increase in age, number of infants and distance to the market reduced time spent on paid job. Primary occupation and age reduced time allocated to unpaid work. Primary occupation and age increased time for leisure while distance to work decreased time on leisure. Well-designed social programs such as training programs, gender equity in all levels of education and expanding education attainment, employment services, childcare facilities, and reform of discriminatory laws will boost their wellbeing.*

KEYWORDS: Determinants, Time Allocation, Tobit Regression, Rural, Women.

INTRODUCTION

Time use is an interdisciplinary study showing how people allocate their time to various activities basically: paid work, unpaid work/household production and leisure. It is a resource, scarce commodity and an economic term (Ilahi, 2000; Zandamella, 2005). It provides the core measure of amounts of work in specific paid occupations and for unpaid work in private households as well as leisure (Gershuny, 2011). Women in most countries have experienced increased freedom in defining what to do with their lives, including participation in the labor market. This has not reduced their obligations in the domestic realm (Medeiros et., al., 2007). They play vital roles as mothers, producers, managers, community developers/organizers etc. Their contribution to the social and economic development of societies is more than half as compared to that of men by virtue of their dual roles in the productive and reproductive spheres (Makama, 2013). Many women who have overcome the barriers that prevented previous generations from full access to the labour market have shouldered a double work shift as a result of partial trade-off between paid and unpaid work (Blackden and Wodon, 2006; Medeiros et. al. 2007). That is why women's labour time and flexibility are much more constrained than the case of men. Yet their participation in the

formal and informal structures and processes, where decisions regarding the use of societal resources generated by both men and women are made, remains insignificant (Makama, 2013).Then, time use in sub-saharan Africa and especially in Nigeria reveals that women spend more time than men at work particularly when their input in non-System of National Account production, namely: domestic and care work are included (Ilahi, 2001; Medeiros et., al., 2007; GDALM, 2010; Adeyoonu, 2012 and Amao, 2015).

Women, especially in rural areas, are subject to heavy time burdens due to their need to balance the demands of their productive, social, reproductive, and community management roles (Ilahi, 2000). Another essential factor affecting time allocation in rural areas of developing countries is the provision of amenities/ infrastructure basically; water, fuel, energy and transportation which are inadequate or non-existent (Ilahi, 2000 16; Suarez, 2010). As a consequence, rural folks are forced to allocate their time to acquire these basic goods from either community sources or open access areas. In most settings the burden largely falls on the women.

Women with grownups/wards have more opportunity of time for paid work than those with infants. Also, women that are educated can manage their time better and earn more (Ruuskaneen, 2004, Amao, 2015). To enhance a better life for active age women, it is imperative that the constraints inhibiting them from working longer hours and earning less in paid work are first identified with the aim of bridging the gap between paid and unpaid work among women. In conclusion, women access to a good education, productive and remunerated activities, as well as a remarkable standard of living is often limited by their responsibility for every day, unpaid household and care activities.

Therefore, time use survey data are important input to policy analysis, useful in designing welfare and empowerment programmes for women as the data can throw light on the drudgery of the poor, their overburden nature of work and provide information on within gender disparities of time use particularly in developing economies.

LITERATURE REVIEW/THEORETICAL UNDERPINNING

Theory of Allocation of Time

According to Heckman (2015), time-use data can be used to estimate both structural relationships, such as household technology, and behavioral relationships, such as the determinants of the allocation of time among activities. The implications on the economy for collecting time-use data for estimation depend critically on the underlying theory. For economists, the starting point for the theory is Becker's "household production "model, in which households are "assumed to combine time and market goods to produce more basic commodities that directly enter their utility functions". Gary Becker's classic study, 'A theory of the allocation of time', laid the analytical foundation for the study of household production and the allocation of time within the household.

The Becker Model

The first economic theory focused on time allocation was initiated by Gary Stanley Becker. The theory is based on the premise that people should decide how long to devote their

activities on the labour market and how to combine the remaining time with goods they can buy on the market to maximize the level of welfare. Becker considers households the producers and consumers, which maximize profits by maximizing the utility of time spent on different types of activities, under a limited time budget. Since time is considered a rare commodity, everyone should be aware of its optimal repartition among its different uses.

It was not until the work of Becker (1965) that economists began to model households formally as engaged in activities producing outputs such as food, children and housing that bundled goods and time. The household consumed these commodities as the direct objects of utility.

Mincer (1962*b*, 1963) made a major contribution to empirical research on the labour supply by women in isolating the effects of wages (the price of time) from pure income effects. While Robbins (1930) had previously distinguished income effects from substitution effects in labour supply, the empirical literature on female labour supply had not made this distinction. Long (1958), in an extensive empirical study, emphasized the role of consumer durables in releasing female time from housework for market uses but did not study the effects of wages on labour supply. In a similar spirit, Becker's (1960) early work on fertility focused on income effects and did not discuss the importance of female time and its price in explaining fertility. It was Mincer who first emphasized the role of the rise in the wage of women as a primary force explaining the growth of female labour supply.

Mincer (1962*b*) introduced another feature of household production that was formalized in Becker (1965). Mincer claimed that the multiple uses of non-market time (in child care and other household activities) produced greater wage elasticity for women than for men because they faced more margins of substitution. While formally this argument is incorrect, the intuition behind it is powerful and continues to shape the thinking about female labour supply (Heckman, 1988).

The household is assumed to produce and consume a vector of commodities Z= (Z_i), *i*= 1,…..*I.* These commodities are associated with different levels of activities performed by the household (e.g. consumption of food, child-rearing, leisure activities), including leisure on the job (Juster and Stafford, 1985; Aguiar and Hurst,2007; Aguiar*et al.*, 2012). Utility is a function of these commodities:

$U(Z_1, \ldots . Z_I)$,

where

$$Z_i = f^{(i)}(X_i, T_i),\ i = 1, \ldots\ldots,\ I \quad (2)$$

X*i* is a vector of goods used to produce *Zi*and *Ti*is time (usually assumed scalar but allowed to be a vector in Becker, 1965). The price of *Zi* depends on the prices of its components. Assuming that each $f^{(i)}$ is homogeneous of degree 1, one can construct a scale-invariant price index π_i for each commodity.

The household faces both time and traditional budget constraints. Using elementary algebra, Becker shows that under these assumptions, the household effectively faces one constraint. Under the assumption that *Ti* is scalar, and that the price of time is *w* across all uses, the maximum amount of income that the person can earn is full income $B = wT + V$ where $T =$

$\sum^{T_i}$ and V is the amount of unearned income accruing to the household. The *Zi* encompass all activities in which time can be used (including the consumption of leisure on the job) and

$$\sum_{i=1}^{I} \pi_i Z_i = wT + V = B. \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3)$$

The household is assumed to maximize (1) subject to (2) and (3). The demands for inputs X_i, T_i are derived from the demands for Z_i. The responsiveness of the demands for different activities in response to changes in the prices of goods and time depends, in part, on the time and goods intensities in producing the commodities. Becker goes on to develop a more general analysis where the marginal cost of time varies across activities. Becker's model of commodity demand is an instance of Gorman's (1959) general separability analysis where *U* is weakly separable in the arguments producing the Z_i, and the *f(i)* are homogeneous of degree 1. Under homogeneous weak separability, consumer decision making can be characterized by a two stage budgeting process. Agents allocate budgets E_i to each commodity *i*, based on the price index π_i and in a second stage maximize each Z_i subject to these allocations determined from the first stage to determine X*i* and *Ti* (Strotz, 1957; Gorman, 1959). Pollak and Wachter (1975) present a definitive analysis of the limitations of the Becker model when the assumption of homogeneous separability is relaxed and when joint production is considered.

Empirical Review

According to Ilahi, in Africa, 15 out of the 17 studies summarized by Brown and Haddad (1995) find out that women work more than men. In Nepal, women spent 50-80% more time working than men. Gender differences in time-use vary by rural-urban status also. Men work less than women in both rural and urban areas, but rural men and women work a lot more than their urban counterparts. Urban women's work time is not much different from that of rural men (Ilahi, 2000). Blackden*et al.* (2005) also argues that women face time constraints particularly due to high burdens associated with household tasks and large families.

In the research carried out by Adeyoonu, (2012) on gender dimensions of time allocation of rural farming households in Southwest Nigeria, the result showed that male respondents spent 12.33 hour (or 73.4%) of the total time spent working in a day during the rainy season which is 16.79 hour on the two monetized activities while female spent 10.49 hour (or 56.3%) of her own working time of 18.64 hour on the activities. The remaining work time of 4.46 h (or 26.6%) for male and 8.15 hour (or 43.7%) for female is spent on house work. The leisure time of male and female stood at 7.21 hour (or 30.0%) and 5.36 hour (or 22.3%), respectively. In all, male spent about 8.1% more time on income earning activities than female. Despite this, female still reported on the average nearly 15.0% less leisure than male due to her involvement in house work which is nearly 29.1% more than that of her male counterpart in addition to economic work; a difference that is common in developing economy. This finding was also similar to what Ikpi (1991) and Ilahi (2000) obtained. They all reported that female allocated more time

The result of the study carried out by Medeiros *et. al., (*2007) on Gender Inequalities in Allocating Time to Paid and Unpaid Work: Evidence from Bolivia showed that, first, on average, women work more than men. The result shows that the average number of hours per week allocated to work by Bolivian women is 10 hours higher than men's. Discounting 10 daily hours for resting and personal care, men allocate 52 percent of their net time to work, while women allocate 62 percent. This heavier workload is basically due to the accumulation of paid and unpaid.

Tobit Model- Measure of the Factors influencing Time Allocation

The Tobit model is used in applications when the true value of a variable is not observed above or below some value (Connelly, 2007). But, as Wooldridge (2002) describes, such situations also appear when people have to choose corner solutions. Thus, they face a maximization problem but cannot choose outcomes below or above a certain value. Characteristic for time use data is the frequent observation of zeros, thus many persons do not engage in the analyzed activity on the survey day. Brown and Dunn (2011) distinguish zero observations into two types: Structural zeros arise because a person does not engage in a certain activity at all; e.g. many adults without children never engage in childcare. Sampling zeros arise because the person does not engage in the activity on the survey day, but might otherwise carry out this activity frequently, (Hammer, 2012).

The results from the Tobit model in the research work of Hammer, (2012) in Statistical Models for Time Use Data: An Application to Housework and Childcare Activities, using the Austrian time use surveys from 2008 and 1992 for women are not much different from those of the linear model, because there are only a few zero observations and the variables he observed are age, household size, upper secondary education, tertiary education, number of children below six (6), living in the city and partner employed. But it does also not deliver more reliable results for men. To evaluate the fit of the model, Hammer compared the sample distribution of time used for housework with a distribution which is simulated using the estimated model. That is, a normally distributed error term with mean zero and the estimated variance is added to the fitted values for the latent variable. Negative values are then censored and set to zero. The Tobit model predicts about the same number of zero observations but underestimates the number of observations who spend a positive but small amount of time in household

MATERIALS AND METHODS

The main objective of this study is to examine the determinants of time allocation among women in rural Oyo State, Nigeria. The specific objectives of this study are to examine the socio-economic characteristics of the respondents, to determine the number of hours allocated to each activity among women, to disaggregate some socio-economic characteristics and time allocation within women's group and to determine the factors influencing the number of hours allocated to each activity among women in rural Oyo State, Nigeria. Oyo State is divided into four main agricultural zones, that is Oyo, Ogbomosho, Saki and Ibadan-Ibarapa Zones, with 7-9 LGAs per zone.

Primary data were used with the aid of a well-structured questionnaire. The data were collected using multi-stage sampling procedure. The first stage was the purposive selection of

two ADP zones i.e Ibadan- Ibarapa Zone and Oyo Zone in Oyo State, Nigeria. The second stage was the purposive selection of two LGAs from each of the zones. These were Ido LGA and Ibarapa East LGA in Ibadan- Ibarapa Zone while Afijio and Atiba were selected in Oyo Zone. The third stage was the random selection of five (5) villages in each LGA, while the fourth stage was the selection of eight (8) women of economical active age from each of the LGAs. Altogether, 160 women were interviewed and 150 questionnaires were found worthy for the study and this information was gotten through ADP list of rural household.

The tools employed for the analysis were descriptive statistics while to bit regression was used to examine the factors influencing the number of hours allocated to each activity following (Rahji, 1999; Ilahi and Grimard, 1999; Ruuskaneen, 2004; Connely and Kimel, 2007). The empirical specification for the Tobit model is:

$$y_{ji}^{*} = \beta j x_i + \mathrm{E}_{ji} \quad \text{.....(1)}$$

Where yji* is the latent variable representing time allocated to activity j by individual i, x, is a vector of explanatory variables, βj is a vector of parameters and εji is the error term. The observed time allocation (yji) variable are related to the corresponding latent time allocation variable by:

Yji=yji * if yji * > 0, otherwise……(2)

Models for paid/farm work, house work and leisure using the empirical specification for each above were estimated.

Where j=1,2,3 (activity) i.e. paid/farm work, house work and leisure respectively.

i=1, 2……150

The explanatory variables were specified as the determinants of time allocation to paid work, unpaid work and leisure separately and were chosen according to the peculiar characteristics of the study area. Multicollinearity was then tested through mean VIF. They are:

(1). Y= Time allocation to paid work, unpaid work and leisure (dependent variables). **Note: The three (3) models were run separately for each of the dependent variables using the same independent variables.**

While the independent variables are:

X_1= Educational Level (years) (Yes= 1, 0 otherwise),

X_2= Primary Occupation- in hours (Yes= 1, 0 otherwise)

X_3= Marital Status (Yes= 1, 0 otherwise)

X_4= Age (years) (Yes= 1, 0 otherwise)

X_5= Household size (Yes= 1, 0 otherwise)

X_6 = Total income (N) (Yes= 1, 0 otherwise)

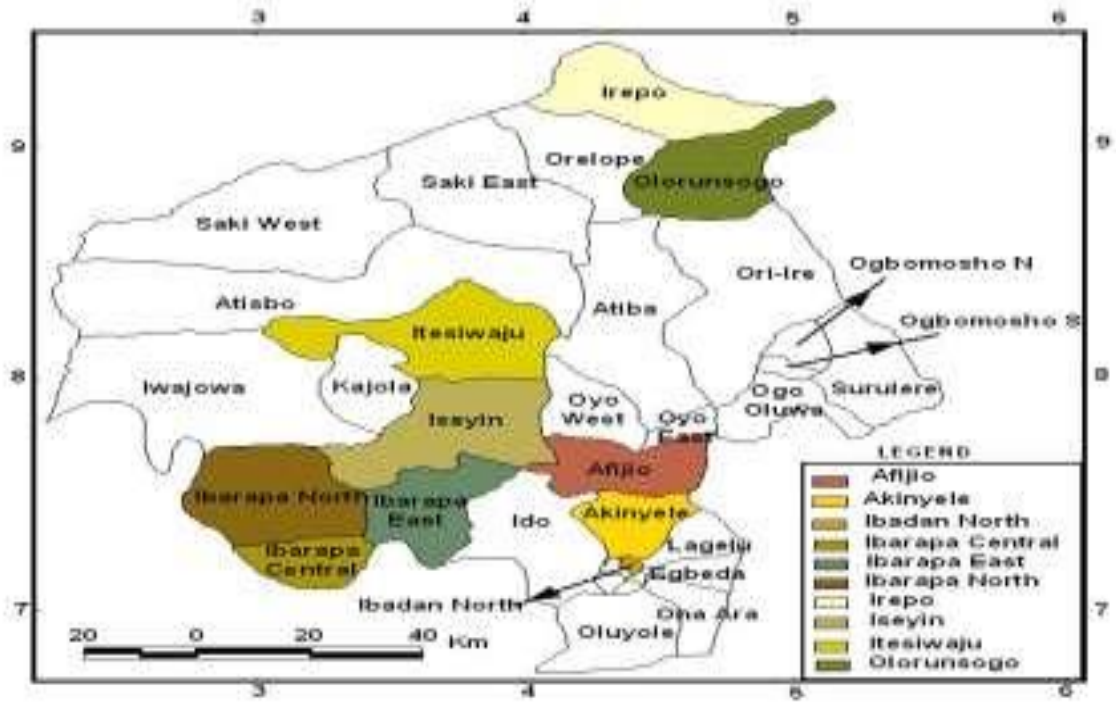
X_7= Distance to place of work (km) (Yes= 1, 0 otherwise)

X_8= Distance to market (km) (Yes= 1, 0 otherwise)

African Journal of Economics and Sustainable Development
ISSN: 2689-5080
Volume 3, Issue 3, 2020 (pp. 88-108)
www.abjournals.org

X_9= Distance to Primary Health Centre (km) (Yes= 1, 0 otherwise)

X_{10}= Distance of source of water (km) (Yes= 1, 0 otherwise



Map of Oyo State

RESULTS AND DISCUSSIONS

Socio-economic Characteristics of the Women

Table 1 revealed that the mean age was 36 years and this implied that majority of the women in the study area were in their economically active and productive age group. The educational status of the women revealed that the highest was 42.7% with primary school education and this implied that majority of them had primary school education. This concurred with the findings study of (Adeyoonu, 2012; Amao, 2015) where over 75% of the women stopped schooling at the primary school level and this affected the proper recalling of time management. About 43.0% of the respondents were farmers, 41.3% were traders, and their occupational status implied that about 85% of the respondents were farmers and traders**.** 54.0% of the women were engaged in trading as their secondary occupation. Most of the women were involved in other streams of income in their neighborhood or even in front of their houses; they combined these with unpaid jobs to improve their standard of living. Expectedly, 88% were married.

Household size revealed that 67.3% were between 5 and 9 household members and the average household size was 8 which can be regarded as large. The reason is that most of the women interviewed lived with extended families while some were from polygamy households. This diverges from the findings by Adeyoonu (2012) in which 76.8% of the respondents had between 2 and 5 household size.

African Journal of Economics and Sustainable Development
ISSN: 2689-5080
Volume 3, Issue 3, 2020 (pp. 88-108)

www.abjournals.org

Table 1: Socio-economic and Household Characteristics of women

Variables	Frequency	Percentages	Mean	Std
Age				
Less than 30	41	27.3		
31-40	48	32.0		
41-50	35	23.3		
51 and above	26	17.3		
	150	**100**	**35.5**	1.06
Years of Schooling				
0 years(no schooling)	42	28.0		
1-6 years	64	42.7		
7-12 years	32	21.3		
Above 12	12	8.0		
	150	**100**	**64**	**.90**
Pry Occupation				
Farming	65	43.3		
Trading	62	41.3		
Civil servant	14	9.3		
Artisans	9	6.2		
	150	**100.0**	**63.5**	**.91**
Secondary Occ				
No sec. occp	34	22.7		
Trading	81	54.0		
Farming	32	21.3		
Artisan	3	2.0		
	150	**100.0**	**34**	
Marital Status				
Single	6	6		
Married	132	88.0		
Widowed	11	7.3		
Divorced/separated	1	.7		
	150	**100.0**	**132**	.37
Household Size				
Less than 4	13	8.7		
4-9	101	67.3		
10-15	33	22.0		
Greater than 15	3	2.0		
	150	**100.0**	**8**	**.59**

Source: Field work 2017

African Journal of Economics and Sustainable Development
ISSN: 2689-5080
Volume 3, Issue 3, 2020 (pp. 88-108)

www.abjournals.org

Distance to Basic Amenities

Table 2 revealed that on the average, the women travelled for about 1.49 km to sources of water and it is due to non-availability of pipe-borne water in some of the households in the study area. The mean distance to the forest to fetch firewood was 1.16 km and this is more common among the farmers. Those in other professions mostly used charcoal and other sources of fuel to cook. The result is similar to the findings of Adeyoonu, 2012 in gender and time poverty in Sub-Saharan Africa where the average distance to water and forest was 1.2km and 0.23km respectively. The findings by Adeyoonu, 2012 were 2.10km and 0.9km, respectively. This implies that fetching water and fire wood occupies much of their time during household production activities.

Furthermore, the average distance to health centers, children's school and religious centres was 2.37km, 1.23km and 1.87km, respectively. Most of the basic amenities were very few and far away from women's households due to the fact that basic amenities are more likely to be concentrated in the urban areas. This implied that time used in getting access to basic amenities occupies an important proportion of women's time for domestic chores and therefore likely reduced the time for paid work. The findings of Adeyoonu, 2012 in distance to school double that of this findings i.e 2.4km. This might be because each rural area has their own peculiarities; some are extremely far from basic amenities.

Table 2: Distance to Basic Amenities

Distance to Fuel	**Frequency**	**Percentage**	**Average**	**Standard Deviation**
< 1km	64	42.67		
1-3km	77	51.33		
>3km	9	6.00		
Total		**100**	**1.16**	**1.58**
Distance to Water				
<1km	30	20.0		
1-3km	113	75.3		
>3km	16	4.6		
Total		**100**	**1.49**	**1.39**
Distance to Health Centre				
<1km	2	1.33		
1-3km	114	76		
>3km	34	22.67		
Total		**100**	**2.37**	**1.60**
Distance to Religious Centre				
<1km	4	2.67		
1-3km	135	90.00		
>3km	11	7.33		
Total		**100**	**1.87**	
Distance to School				
<1km	32	21.33		
1-3km	117	78.00		
>3km	8	5.33		
Total		**100**		

Source: Data Analysis 2017

Time Allocation by Women in the Study Area

Average Time Allocation by Women in the Study Area

Table 3 showed the time allocated by women to paid work, unpaid work and leisure. Time allocation constitutes paid job/farm work/market work, unpaid job/household production and leisure (Ilahi,2000; Zandamella, 2005; Blackdeen and Wodon, 2006).

The study revealed that 38.6% of respondents spent between 6 and 7 hours on paid job, 57.3% spent 8-9 hours while 3.3% spent 10-12 hours. Only 0.7% of the respondents spent over 12 hours in paid jobs. The average number of hours spent on paid job was 8 by women in the study area.

It was also found that 2.0% of the respondents spent between 1-2 hours, 15.4% spent 3-4 hours, 68.7% spent 5-6 hours and 14% spent 7-8 hours on unpaid job. The average time spent on unpaid job was 5.38 hours. This showed that women spent many hours on household chores that has no financial compensations.

The average leisure time excluding sleep spent by women in the study area was 2.51 hours in a day which showed that women have little or no time for leisure in the study area. This is confirmed by (Ruuskaneen, 2004; Medeiros et, al., 2007; Suarez, 2010).

The result of this study was similar to the study carried out by Blackden and Wodon, 2006, average hours for paid and unpaid work was 7.23 hours and 7.33 hours per day, respectively. While it was in contrast to the study by Ruuskaneen, 2004 paid job, unpaid job, leisure and personal care were 5.45 hours, 4.17hours, 5.62 hours and 8.7 hours, respectively. In case of Nigeria, the study carried out by Adeyoonu, 2012 revealed 4.27 hours for market activities and 8.15 hours for non- market work for women farmers.

Table 3: Time Allocation for Paid job, Unpaid job and Leisure

Time spent on paid job (hrs)	**Frequency**	**Percentage**	**Mean**	**Standard Deviation**
<7	58	38.6%		
8-9	86	57.3		
10-12	5	3.3		
≥13	1	.7	7.967 ≈8hrs	1.0645
Total	**150**	**100**		
Time spent on unpaid Job				
1-2	3	2.0		
3-4	23	15.4		
5-6	103	68.7		
7-8	21	14.0	5.38≈5hrs	1.1682
Time spent on leisure				
1-2	76	50.7		
3-4	73	48.6		
>4	1	.7	2.507	.9322

Source: Data Analysis 2017

African Journal of Economics and Sustainable Development
ISSN: 2689-5080
Volume 3, Issue 3, 2020 (pp. 88-108)

www.abjournals.org

Disaggregation of some Socio-economic Characteristics and Time Allocation by the Women

Table 4 revealed the disaggregation of some socio-economic characteristics and time allocation by women. These socio-economic-characteristics are age, occupation, educational status, household size and marital status.

Disaggregation of Age on the Average Time Spent on Paid Job, Unpaid job and Leisure of the Respondents

Paid jobs: women less than or equal to 30 years of age spent 7.45 hours, 31-40 years spent 8.20 hours, 41-50 years spent 8.40 hours while women of ages 51 years and above spent 7.50 hours on paid job in a day**.** This showed that women between ages 41-50 spend more hours on paid job. This may be as a result of the fact that majority of them have grown up children that assists them in household production activities. It may also be due to the fact that most of them do not have infants.

Unpaid job: women that were less than 30 years spent an average of 6.41 hours in a day, 31-40 years spent 5.67 hours, 41- 50 years spent 4.74 hours and 51 years and above spent 4.85 hours on household production activities. This might be as a result of the younger women having infants to cater for and care work consumes more time during household production activities.

Leisure: women less than 30 years spent average of 2 hours in a day, 31-40 years spent 2.19 hours, 41-50 years spent 2.69 hours and women of ages 51 and above spent 3.27 hours a day. The young women combined reproductive care and extended family care according to the belief of Sub-Saharan Africa. Therefore, the higher the age of the economically active class of women in the study area, the more the time dedicated to leisure.

This is in contrast with the study of Connelly et. al., 2007 who opined that older women/ mothers spent more time in home production both weekdays and weekends, also Lockshin, et al (2000) have revealed that mothers group of 26-35 years are more likely to be economically active as compared to other groups. La (2002) has found a negative relationship between age and woman's time allocation to work.

Disaggregation of Occupation on the Average Time Spent for Paid Job, Unpaid job and Leisure

Paid job: women who were into farming spent an average of 7.86 hours a day. Traders spent 8.03 hours, Civil Servants spent 8.36 hours and Artisans spent 7.50 hours in a day. This implied that those that are self-employed decide the number of hours they spent on their jobs per day while there is official knock-in and knock-off time for those in the formal sector. They coincidentally spent more time on their jobs and earn more than the self-employed in the study area.

Unpaid job: women farmers spent an average of 5.45 hours in a day in unpaid jobs/household production activities, traders spent 5.63 hours, civil servants spent 5.14 hours and Artisans spent 5.67 hours. This implied that women in the formal sector spent the least time in the household chores because they spend more time than other women on their paid jobs.

Leisure: women that were farmers spent an average of 2.51 hours in a day, traders spent 2.40 hours, Civil servants spent 2.30 hours and Artisans spent 2.50 hours.

In conclusion, those in the formal sector spent more time on paid job while they spent the least time in household chores and leisure.

Disaggregation of Educational level on the Average Time Spent on Paid Job, Unpaid job and Leisure of the Respondents

Paid work: women with non-formal education spent an average of 7.86 hours in a day on paid job, those with primary school education spent 7.90 hours, those who had secondary school education spent 8.17 hours while those who had tertiary education spent 8.31 hours on paid jobs. The result is similar to that of occupational disaggregation on paid job and since most of the women with tertiary education are in the formal sector, they spent the highest number of hours on paid jobs.

Unpaid job: women with no formal education spent an average hour of 5.64 in a day, those with primary education spent 5.35 hours, those with secondary education spent 5.50 hours and those with tertiary education spent 5.92 hours.

Leisure: revealed that women with no formal education spent an average of 2.38 hours for leisure in a day, those with primary education spent 2.60 hours, women with secondary school education spent 2.22 hours, while women that passed through tertiary education spent 2.38 hour.

From the result women with tertiary school education recalled the time spent on paid job, unpaid job and leisure more accurately, they were able to accurately give the details of their time allocation. This is supported and buttressed by Ruskaneen (2004); Amao (2015) that the educated cherish and manage their time better than other categories of women.

Disaggregation of Household size on the Average Time Spent on Paid Job, Unpaid job and Leisure.

Paid job: Households with 1-4 members spent an average of 7.92 hours in a day, 5-9 members spent an average of 7.99 hours, 10-14 members spent 7.67 hours, while households having 14 members and above spent 9.00 hours. It shows that households with 14 members and above spent the highest number of hours to paid job. The reason could be because households with larger sizes have more dependants and they have to work more hours in other to cater for their dependants.

Unpaid job: Households having 1-4 members spent an average of 5.31 hours in a day, 5-9 members spent 5.40 hours, 10-14 members spent 5.33 hours and households with 14 members and above spent 5.67 hours in a day. Households with highest members have more dependants especially infants and therefore their time for care work and household production activities are increased.

Leisure time: Households having 1-4 members spent an average of 2.52 hours in a day, 5-9 members spent 2.37 hours, 10-14 members spent 2.82 hours and members that are 14 members and above spent 1.83 hours on leisure in a day. Households having 14 members and above spent the highest number of hours on paid job and unpaid job, automatically, their time

spent on leisure will reduce. They have a lot of dependants to cater for both financially and care-wise.

Disaggregation of Marital status on the Average Time Spent on Paid Job, Unpaid job and Leisure.

Paid job: Singles spent an average of 7.67 hours on paid job in a day, married spent 7.95 hours, widowed spent 8.27 hours and divorced/separated spent 9.00 hours in a day. This revealed that the widowed and separated (female headed households) spent the highest number of hours on paid job since they are the breadwinner of their household. This is in consonance with the study of Awunbila, (2006); Wrigley-Asante (2008) and Amao, (2015) that female household head, spent more time on paid job in order not to be poorer and more vulnerable than their counterparts. While the singles do not have much commitment to their work but after marriage they would be forced by their circumstances to seek employment or spent more hours on paid jobs in order to support their growing families, this is buttressed by Tasnim and Rana (2009)

Unpaid job: Singles spent an average of 5.83 hours in a day, married spent 5.27 hours, widowed spent 4.18 hours and the divorced/separated spent 5.00 hours. The implication is not farfetched, the female headed household spent the lowest time to unpaid job because paid job has occupied more of their time.

Leisure time: Singles spent an average of 2.50 hours on leisure in a day, married spent 2.43 hours, widowed spent 2.67 hours and the divorced/ separated spent 2.30 hours in a day.

This is buttressed by Gonzalez (2004) who concluded that married women (with or without children) devoted more time to work than never married [see also, McGrattan and Rogerson (2004)]. Naqvi and Shahnaz (2002) concluded that married women are less likely to participate in economic activities. Jones, et al (2003) has also shown that married women and single women have different approaches towards work-hour.

Table 4: Disaggregation of some Socioeconomic Characteristics on Time Allocation among Women

Age	**Average Time for paid job**	**Average time for unpaid job**	**Average time for leisure**
Less than ≤ 30	7.45	6.41	2.00
31-40	8.20	5.67	2.19
41-50	8.40	4.74	2.69
51 and above	7.50	4.85	3.27
Primary Occupation			
Farming	7.86	5.45	2.51
Trading	8.03	5.63	2.40
Civil servants	8.36	5.14	2.30
Artisans	7.50	5.67	2.50
Others	7.67	6.00	2.67
Level of Education			
Non-formal education	7.86	5.64	2.38
Primary education	7.90	5.35	2.60

Secondary education	8.16	5.50	2.22
Tertiary education	8.31	5.92	2.38
Household Size			
1-4	7.92	5.31	2.52
5-9	7.92	5.40	2.37
10-14	7.67	5.33	2.82
Greater than 14	9.00	5.67	1.83
Marital Status			
Single	7.67	5.83	2.50
Married	7.95	5.47	2.43
Widowed	8.27	4.18	2.67
Divorced/separated	9.00	5.00	2.20

Source: Data Analysis 2017

Factors influencing the number of hours allocated to activities by Women.

Tobit regression model was used to examine the factors influencing the number of hours allocated to each activity following (Ruuskaneen, 2004; Connelly and Kimel, 2007) The explanatory variables were specified as the determinants of time allocation to paid work, unpaid work and leisure separately. Multicollinearity was tested and the mean VIF for paid, unpaid and leisure were 1.66, 1.69 and 1.66, respectively. This shows a slight multicollinearity and its fit for this analysis. The dependent variables are time allocation to paid work, unpaid work and leisure and the models were run separately for each of the dependent variables using the same independent variables.

The independent variables are: Educational Level (years), primary occupation, marital status, age (years), household size, total income (Naira) distance to place of work (km), distance to market (km), distance to primary health centre (km) and distance of source of water (km)

Factors influencing the number of hours allocated to paid work

Table 4 presents the result of the factors influencing the number of hours allocated to paid work by the women. Primary occupation was inversely related to time use on paid job, a unit increase in time spent by civil servants at work reduces their time to other activities by 0.7800 hours. This implies that the number of hours allocated to paid job reduces time spent on other activities.

Likewise, total income was positively significant and are directly related to the respondents' time used on paid job by 0,0002 hours. People are motivated and increase the time spent on paid job when their income increases. The higher income will motivate them to increase the time they spend on paid job. This is in accordance with (Rahji, 1999; Adeyoonu, 2012), who revealed that the higher the income, the more the time allocated to paid job.

African Journal of Economics and Sustainable Development
ISSN: 2689-5080
Volume 3, Issue 3, 2020 (pp. 88-108)

www.abjournals.org

Table 5: Tobit Regression Estimate of Factors Influencing the Number of Hours Allocated to Paid Work

Log Likelihood = -218.38821 Number of obs= 149
LR chi2(17) = 11.84 Prob> chi2= 0.8097
Pseudo R2= 0.0264

Factors Influencing Paid Work	Coefficient	Std. Err.	T	P>|t|
Education(1-6 years)	.0807706	.2214552	0.36	0.716
(7-12 years)	.3472114	.2688065	1.29	0.199
(Above 12 years)	.5592769	.4784288	1.17	0.245
Pry Occupation-Trading	-.1960048	.2102248	-0.93	0.353
Civil Servants	-.7799705	.444753	-1.75*	0.082
Artisans	-.2737078	.4965285	-0.55	0.582
Marital Status- Married	.2433704	.4835197	0.50	0.616
Widowed	.5792609	.5832225	0.99	0.322
Divorced	1.113738	1.193978	0.93	0.353
Age	.0009492	.009123	0.10	0.917
Household Size	.0269235	.038887	0.69	0.490
Income	.0001891	.0000101	1.86*	0.065
Dist. to place of Work	-.0006714	.0068076	-0.10	0.922
Dist. to Market	-.0035556	.0071219	-0.50	0.618
Dist. To Health Centre	-.0056119	.0082803	-0.68	0.499
Dist. To Source of Water	.0075541	.0087498	0.86	0.390
Cons	7.066854	.7397447	9.55	0.000
/Sigma	1.054356	.0627431		

Source: Data Analysis 2017 *Note: *** = sig at 1%, **= sig at 5%, *= sig at 10%*

Factors influencing the number of hours allocated to Unpaid work

Table 5 presents the results of the factors influencing the number of hours allocated to unpaid work by women. The result of the Tobit regression revealed that, level of education is negatively significant to the time spent on unpaid job. A unit increase in the level of education decreases the time spent on unpaid work by 0.4766 hours. This might be as a result of the fact that the higher the level of education of the female respondents, the greater the opportunity to be employed in the formal sector. With higher level of education, women are expected to acquire time management skills which give them the consciousness to spend lesser time on household production activities. This concurs with the study carried out by Adeyoonu, 2012 who opined that, years of schooling are unequivocally associated with females' non-farm time and with higher level of education, the female respondent is expected to have acquired time management skills which will allow her spend lesser time in the kitchen and releasing more time for non-farm work.

Primary occupation is negatively significant to time for unpaid work especially by the Artisans. This implies that the number of hours allocated by Artisans to their paid job reduces the time spent for household production activities by 0.2053 hours.

Likewise, marital status is negatively significant to time for household production activities specifically among the widows at 0.9375 hours. Widows are the bread winner of their family, they spent extra time on paid job in order to earn more and therefore time for unpaid activities were reduced

Age is also negatively significant to household production activities. An increase in age of the women will reduce the time spent on unpaid household activities by 0.502 hours. This might be because older women have grown up who assist them in household chore while younger women are more occupied with child bearing and infant care/child care. This concurs with the findings of Adeyoonu, 2012 who opined that as farmers grow older, the strength to be involved in outside strenuous activities decreases. Hence more time freed for household chores.

Table 6: Estimate of Tobit Regression for Factors Influencing the Number of Hours Allocated to Unpaid Work.

Log likelihood = -205.55142 Number of obs = 149
LR chi2(17) = 62.31 Prob> chi2 = 0.0000
Pseudo R2 = 0.1316

Factors Influencing Unpaid Work	**Coefficient**	**Std. Err.**	**T**	**P>|t|**
Education(1-6 years)	-.1981634	.2001805	-0.99	0.324
(7-12 years)	-.4765662	.2428903	-1.96**	0.052
(Above 12 years)	-.1808829	.4321087	-0.42	0.676
Pry Occupation-Trading	-.0584571	.1899078	-0.31	0.759
Civil Servants	-.2144452	.3965767	-0.54	0.590
Artisans	-2.205372	.5951409	-3.71***	0.000
Marital Status- Married	-.091719	.4375242	-0.21	0.834
Widowed	-.9375254	.527165	-1.78*	0.078
Divorced	.1406766	1.0802405	0.13	0.897
Age	-.05023772	.0082405	-6.10***	0.000
Household Size	.0468806	.035095	1.34	0.184
Income	5.19e-06	9.15e-06	0.57	0.572
Dist. to place of Work	.0063339	.0061504	1.03	0.305
Dist.to Market	.003024	.0064207	0.47	0.683
Dist. To Health Centre	.0051835	.0074506	0.70	0.488
Dist. To Source of Water	-.0060823	.007909	-0.77	0.443
Cons	7.183586	.6682745	10.75	0.000
/Sigma	.9542692	.0559774		

*Source: Data Analysis 2017Note: *** = sig at 1%, **= sig at 5%, *= sig at 10%*

African Journal of Economics and Sustainable Development
ISSN: 2689-5080
Volume 3, Issue 3, 2020 (pp. 88-108)

www.abjournals.org

Factors influencing the number of hours allocated to Leisure time

Table 6 revealed the factors influencing the number of hours allocated to leisure time by the women. The tobit regression revealed that age has a direct influence on the amount of time allocated to leisure. A unit increase in age of the women leads to an increase in the time allocated to leisure by 0.0546 hours. This might be because as the women grow older, the strength to do tedious paid job reduces and hence return home earlier to have rest. This finding concurs with the study of (Skoufias, 1993; Adeyoonu, 2012) who opined that as the respondents grow older, the strength to do strenuous work decreases and hence they retired to their house early. They concluded that leisure time increases with increase in age. Distance to place of work is negatively significant to time for leisure. A unit increase in the time spent to get to their place of work reduces the time for leisure by 0.0102 hours. This means that part of the time for leisure has been occupied by the longer distance to their place of work.

Distance to source of water is inversely related to leisure time of the women. Part of their time for leisure has been used in fetching of water in long distance. This is similar to the study carried out by (Ilahi and Grimard, 1999) on leisure time of female and water distance who opined that water source was inversely related to leisure time, meaning that the longer the distance, the lower the leisure time.

Table 6 Factors Influencing the Number of Hours Allocated to Leisure Time.

LR chi2 (18) = 67.72 Prob> chi2= 0.0000
Pseudo R2 = 1.1585 Log likelihood = -179.77255

Factors Influencing Leisure	Coefficient	Std. Err.	T	P>|t|
Education (1-6 years)	.1746792	.1752521	1.00	0.321
(7-12 years)	-.0098064	.2135342	-0.05	0.963
(Above 12 years)	-.057576	.3853758	-0.15	0.889
Pry Occupation-Trading	.0233612	.1674304	0.14	0.889
Civil Servants	-.3922416	.3548979	-1.11	0.271
Artisans	.8751733	.5134876	1.70	0.091
Marital Status- Married	-.4345175	.3871004	-1.12	0.264
Widowed	-.6119091	.4650511	-1.32	0.191
Divorced	-1.292873	.9383244	-1.38	0.171
Age	.0545916	.0082892	6.59***	0.000
Household Size	-.523241	.0319236	-1.64	0.104
Income	5.95e-06	8.29e-06	0.72	0.474
Dist. to place of Work	-.0101741	.0054886	-1.85*	0.066
Dist.to Market	.0004317	.0057154	0.08	0.940
Dist. To Health Centre	.0076826	.0065196	1.18	0.241
Dist. To Source of Water	-.0166166	.0069124	2.40***	0.018
_cons	.7610336	.5966181	1.28	0.204
Sigma	.8273016	.0530178		

*Source: Data Analysis 2017Note: *** = sig at 1%, **= sig at 5%, *= sig at 10%*

Implication to Research and Practices

Information on productive time use (in economic activities) and the welfare level enjoyed by people will go a long way as basis for economic policy and planning.

- Time use research should be included in System of National Account (SNA)
- Anchoring Agricultural mechanization (for ease of processing and harvesting), Infrastructural investments (good roads, supply of water and electricity) to be directed in part towards meeting the requirements of household production and the household economy, will help women to reduce their time burdens on unpaid job.

CONCLUSION

The findings revealed that women in the economically active age are young and they are one of the major economic supporters of their household. The hours per day for paid job, unpaid job and leisure were 7.97±1.06, 5.39±1.17 and 2.51±0.93, respectively. Disaggregation of some socioeconomic characteristics on time allocation by the women revealed that the female headed households (widowed and separated) spent more time on paid job, younger women with infants spent more time on unpaid job, while the older women spent more time on leisure i.e higher the age of the women, the more the time dedicated to leisure.

The tobit regression result revealed that a unit increase in educational level increased time spent on paid job and being married increased time for paid job by while increase in age, number of infants and distance to the market reduced time spent on paid job. Primary occupation and age reduced time allocated to unpaid work. Primary occupation and age increased time for leisure while distance to work decreased time on leisure.

Women of economically active age should buy time with money by employing helpers/ nannies in household chores so that they can concentrate more on their paid jobs and have more time for leisure and rest. It is recommended that Information on productive time use (in economic activities) and the welfare level enjoyed by people will go a long way as basis for economic policy and planning. Anchoring Agricultural mechanization (for ease of processing and harvesting), Infrastructural investments (good roads, supply of water and electricity) to be directed in part towards meeting the requirements of household production and the household economy, will help women to reduce their time burdens on unpaid job. Lastly, well-designed social programs such as training programs, gender equity in all levels of education and expanding education attainment, employment services, childcare facilities, and reform of discriminatory laws will boost their wellbeing.

Future Research

- Time Allocation and Income Inequality Among Women
- Health Shocks and Time Allocation on Agricultural Labour Participation

REFERENCES

Adeyoonu, A.G. 2012. Gender Dimensions of Time Allocation of Rural Farming Households in Southwest Nigeria.*Current Research Journal of Social Sciences* 4(4): 269-276

Aguiar, M. and Hurst, E. 2007. Measuring trends in leisure: The allocation of time over five decades, Quarterly Journal of Economics, vol. 122(3), pp. 969–1006.

Aguiar, M., Hurst, E. and Karabarbounis, L. 2012. Recent developments in the economics of time use, Annual Review of Economics, vol. 4, pp. 373–97.

Amao O. 2015. Inequalities of Time Allocation among Male and Female Headed Household in Ibarapa East Local Government Area, Oyo State, Nigeria: The Welfare Implications. *Journal of Economics and Sustainable Development* ISSN 2222-1700(Paper) ISSN 2222-2855(Online) Vol: 6, No.10, 2015

Apps, P. 2003. "Gender, Time Use, and Models of the Household." Sydney: Faculty of Law, University of Sydney. Discussion Paper No. 796, Pp 5-17.

Awumbila M 2006 Gender equality and poverty in Ghana: implications for poverty reduction strategies. GeoJournal 67: 149-161.

Becker, G. S., 1965. "A Theory of Allocation of Time," Economic Journal, 75, 493-517

Becker, G.S. 1960. An Economic Analysis of Fertility. Demographic and Economic Change in Developed Countries. New York, NY: Columbia University Press, pp. 209–40. http://www.nber.org/chapters/c2387.

Blackden, C. M., and Q. Wodon. 2005. Gender, Time Use, and Poverty in Sub-Saharan Africa Working Paper 73, World Bank, Washington, DC.

Blackden, C.M. 2002. "All Work and No Time: Time Poverty as a Development Issue in Africa." Poverty Reduction and Economic Management, Africa Region, The World Bank, Washington, D.C. Processed.

Brown, L. R. and L. Haddad, 1995. Time Allocation Patterns and Time Burdens: A Gendered Analysis of Seven Countries. International Food Policy Research Institute, Washington DC. Mimeo.

Connelly, R; Kimmel, J. 2007. Spousal influences on parents' non-market time choices, IZA Discussion Papers, No. 2894 http://hdl.handle.net/10419/34536.

Gender Disparities inAfrica's Labor Market (2010): The International Bank for Reconstruction and Development / The World Bank1818 H Street NWWashington DC 20433

Gershuny, J. 2011. Time-use surveys and the measurement of national well-being, *Centre for Time Use Research*, University of Oxford, Swansea, UK, Office for National Statistics.

Gorman, W.M. 1959. 'Separable utility and aggregation', Econometrica, vol. 27(3), pp. 469–81.

Hammer, Bernhard (2012). Statistical Models for Time Use Data: An Application to Housework and Childcare Activities Using the Austrian Time Use Surveys from 2008 and 1992; Master Thesis in Statistics: University of Vienna

Heckman James J 2015. Introduction to a theory of the allocation of time: The Economic Journal, 125 (March), 403–409.Doi: 10.1111/ecoj.12228©2015

Heckman, J.J. 1988. 'Time constraints and household demand functions', in (T. P. Schultz, ed.), Research in Population Economics: A Research Annual, 1988, p. 3–14. Greenwich, CN: JAI Press

Ikpi, A., 1991. Household Time Allocation-The Ultimate Determinant of Improved Agricultural Technology Adoption in Nigeria: An Empirical Activity Interface Impact

Model Sustainable agricultural development: The role of international cooperation. Proceedings 21st International Conference of Agricultural Economists Held at Tokyo, Japan 22-29 August 1991. Dartmouth Publishing Co. Ltd., Gower House, Craft Road, Aldershit, England, pp: 481-501.

Ilahi, N. 2000. The Intrahousehold Allocation of Time and Tasks: What Have we Learnt from the Empirical Literature? Policy Research Report on Gender and Development. Working Paper Series No.13. The World Bank. Development Research Group/Poverty Reduction and Economic Management Network.

Ilahi, N. and F. Grimard. 1999. "Public Infrastructure and Private Costs: Water Supply andTime Allocation of Women in Rural Pakistan," *Economic Development and Cultural Change*, forthcoming.

Ilia, Nadeem 2001. Gender and the Allocation of Adult Time: Evidence from the Peru LSMS Panel Data, Paper for the Policy Research Report on Gender.*LAC PREM*, the World Bank

Juster, F.T. and Stafford, F.B. 1985. *Time, Goods, and Well-Being*, Institute for Social Research, University of Michigan, a book of research findings from the 1975–76 Time Use Survey.

Kes A. and Swaminathan H. 2006. Gender and Time Poverty in Sub-Saharan Africa. World bank Working Paper No 73. http://www.faqs.org/periodicals/201005/2093689321.html#ixzz1GwRCLm6m

Long, C. 1958. The Labor Force Under Changing Income and Employment, (Gen. Ser. 65), New York:Princeton University Press.

Makama, G. A. 2013. Patriarchy And Gender Inequality In Nigeria: The Way Forward in*European Scientific Journal June 2013 edition* vol.9, No.17 ISSN: 1857 – 7881 (Print) e - ISSN 1857- 7431 115

Mattila-Wiro P. 2010. Value of Housework time and Changes in Traditional Econonic Well-being in Finland in 1979-2000. *Electronic International Journal of Time Use Research*, 2010, vol 7, issue 1, 17-41.

Medeiros, M., R.G. Osirio and J. Costa. 2007. "Gender Inequalities in Allocating Time to Paid and Unpaid Work: Evidence from Bolivia". Working Paper 495, The Levy Economics Institute Annandale-on-Hudson, NY 12504-5000. http://www.levy.org

Mincer, J. 1962*b*. 'Labor force participation of married women', in (H. G. Lewis, ed.), *Aspects of LaborEconomics*, pp. 63–97, Princeton, NJ: Princeton University Press.

Mincer, J. 1963. 'Market prices, opportunity costs, and income effects, in (Carl F. Christ ed.) *Measurement inEconomics: Studies in Mathematical Economics and Econometrics in Memory of Yehuda Grunfeld*, pp. 67–82, Stanford, CA: Stanford University Press.

National Bureau of Statistics. 2006. National Bureau of Statistics, Socio-Economic Survey on Nigeria. NBSN, Abuja. NPC, 2006. National Population Commission, 2006. Nigerian Census Report.

NPC. 2006. National Population Commission, 2006. Nigerian Census Report.

Pollak, R.A. and Wachter, M.L. 1975. 'The relevance of the household production function and its implications for the allocation of time', Journal of Political Economy, vol. 83(2), pp. 255–78.

Rahji, M.A.Y. 1999. Gender Aspects of Farm Household Time Allocation in South-Western Nigeria. Issues in African rural development monographs series; #19. Sterling Publishers Printers Ltd.

Robbins, L. 1930. On the elasticity of demand for income in terms of effort', Economica, 29, pp. 123–29.

Ruuskaneen, O.P. 2004. More than two hands – Is multitasking an answer to stress?, in: Ruuskaneen, O.P. (2004). An econometric analysis of time use in Finnish households, Unpublished PhD thesis, Helsinki School of Economics, ActaUniversitatisOeconomicaeHelsingiensis.

Ruwanpura, K. N. 2004. Quality of women's employment: A focus on the South International Institute for Labour Studies Geneva. Discussion paper 151, pp 1-25. Online Available: http://www.ilo.org/inst.

Skoufias, Emmanuel, 1993. "Labor Market Opportunities and Interfamily Time Allocation in RuralHouseholds in South Asia," Journal of Development Economics, 40, 277-310.

Strotz, R.H. 1957. 'The empirical implications of a utility tree', Econometrica, vol. 25(1), pp. 269–80.

Suárez. R. P 2010.Gender Disparities in Time Allocation, Time Poverty, and Labor Allocation Across Employment Sectors in Ethiopia In Gender Disparities in Africa's Labor Market © 2010 The International Bank for Reconstruction and Development / The World Bank 1818 H Street NW Washington DC 20433

Wooldridge, J. 2002. Econometric Analysis of Cross Section and Panel Data. The MIT press.

Wrigley-Asante C. 2008. Men are poor but women are poorer: Gendered poverty and survival strategies in the Dangme West District of Ghana. NorskGeografiskTidsskrift – *Norwegian Journal of Geography* 62(3): 161-170.

Zandamela, H. 2005. An Enquiry into Time Allocation and Rural Household Production, and their Implications for Economic Well-Being; Paper to be submitted for Annual Conference on Development and Change Mission: Promoting Development in a Globalized World Delhi, India, December 02-04, 2005