Determinants of Access to Rural Infrastructure among Female Farming Households in Southwest Nigeria

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Abstract: Limited access to roads, storage, processing facilities, and potable water has been reported to severely impact rural women in several ways, contributing to quality of life, deteriorating health, ineffective time allocation, increased poverty rates, impaired agricultural productivity, and limiting achievement of Sustainable Development Goals targets 9 of building resilient infrastructure. Therefore, this study investigated the determinants of rural infrastructure among female farming households in Southwest Nigeria. A multi-stage sampling procedure selected 575 respondents from Ogun, Ondo, and Osun states. We analyzed the data using descriptive statistics, the infrastructure index, and the truncated Tobit regression model. The descriptive statistics show that the age and household size were 47.7±7.1 years and 5.5±1.6 persons, respectively. Most women (67.8%) were married and had primary education (67.1%). Most households were male-headed (65.7%), with farming experience of 19.84±7.9 years. Telecommunication (0.95) was the most accessed infrastructure, followed by electricity (0.93), market (0.72), road (0.66), health (0.58), and portable water (0.35), while modern storage facilities were the least accessed (0.03). The infrastructure access index was 0.61±0.1. Most (84.0%) of the women had moderate access, while 7.5% had high infrastructure access. Women who access credit through cooperative associations, more experienced farmers, and divorced women are most likely to access infrastructure. This study recommends that the public and private sectors collaborate in providing modern storage facilities for rural farmers. The government should embark on women-friendly agricultural programmes to ensure group collaboration, timely inputs, land for farming, and access to technologies for more women to embrace agriculture.

Keywords: Agriculture, Rural Households, Women Farmers, Infrastructure, Nigeria**.**

1.0. INTRODUCTION

Infrastructure access is necessary for productive agricultural activities, and its adequacy is a critical component of productivity, empowerment, development, and sustainable economic growth in developing countries (Caldéron & Servén, 2010; Olaseni & Alade, 2012; Adenipekun, 2013; Diaz Sarachaga et al., 2016; Olaore et al., 2021). According to emerging global trends, rural growth and development are crucial in advancing the African continent (Gurara et al., 2018), and agriculture is critical to this development since it is a significant employer in the rural setting and a trigger for GDP and wealth formation processes in many developing countries, including Nigeria (Ogbalubi & Wokocha, 2013; Gashu et al., 2019; Resnick et al., 2020). The infrastructure needed for farm operations, human

development, and welfare is hinged on its provision and the opportunity to use it (that is, access), which in turn depends on investments in infrastructural facilities (also referred to as public goods) such as roads, markets, storage facilities, irrigation, electricity, portable water, schools, and hospitals (Granda et al., 2019). However, infrastructure is funded chiefly publicly, with about 70–80 percent of the total infrastructure spending coming from public funding and only about 20–30 percent from the private sector through public-private partnerships (Mohun et al., 2016), making infrastructure access largely dependent on government. According to 2010 World Bank research, there is a need for double spending on infrastructure every year to bridge the infrastructure deficit in Nigeria, other Sub-Saharan African nations, and South

Asia (Calderon et al., 2018; Foster & Pushak, 2011). Limited access to roads, electricity, storage, processing facilities, and potable water has been reported to severely impact rural women in several ways, such as poor quality of life, deteriorating health, ineffective time allocation, increased poverty rates, and impaired agricultural productivity (Agénor & Agénor, 2014; Ondiege et al., 2013). Also, less than forty percent of Africans have access to electricity, only about one-third have access to proper roads, and just 5% of arable or farmland is irrigated (Keberuka, 2011). Additionally, to achieve the Sustainable Development Goals (SDG) targets, access to roads, improved water, health care, electricity, and telecommunications, and women and girls should be given attention (Anderson et al., 2021). For instance, SDG goal 5, which is to achieve gender equality and empower all women and girls, is hinged on adequate provision and access to infrastructural facilities (Yount et al., 2019; Granda et al., 2019; Anderson et al., 2021). Statistically, about 783 million people in low-income developing nations do not have the opportunity to use clean water (3 in 10 people lack access to improved 3 water services), and about 1.6 billion do not have electricity. In comparison, up to 2.5 billion people do not have adequate sanitation (6 in 10 people). Almost a billion people need access to good roads (World Bank, 2010). Infrastructure access has been commonly acknowledged as limiting women's productive economic opportunities. Policymakers and decision-makers in providing infrastructural facilities often do not pay attention to women's time in domestic labour, hence overlooking the effect and implication of infrastructure on women's capabilities (Koolwal & Van de Walle, 2013). In general, women do not particularly access different kinds of infrastructure from their male counterparts, and the issues of infrastructure access concern women and other underprivileged or marginalized groups. However, women are unique in the delivery of their roles since they are the primary caregivers in the household in addition to their productive endeavours. Women are significant among several unempowered subsets of society (marginalized, minority, etc.); they are strategically placed within the household as individuals and overlap other categories of people. Family and household interactions are also central to the unempowerment of women in ways different from other genders (Uyang et al., 2016). Women are particularly affected by the lack of infrastructure regarding their time spent sourcing water for their families and productive purposes like irrigation, processing, and marketing of produce. They are also affected when they spend productive time looking for health services for themselves and other family members. Also, regarding access to resources, women are more disadvantaged, making them less economically active and unable to participate in the labour market like others (Independent Evaluation Group (IEG), 2017; Islam et al., 2019). This study examines the determinants of access to rural infrastructure among female farming households in southwest Nigeria. Rural women farmers in Southwestern

Nigeria spend considerably more of their time (65%) on household activities in all cropping seasons than their male counterparts, who spend approximately 35% of their time (Adeyonu et al., 2012). It was also noted that rural men in southwestern Nigeria spend 89% more time than women on income-generating activities. In comparison, women spend 21.7% less time on leisure activities than men due to housework and their economic activities. This study is necessary because it will help policymakers understand the relationship between women and infrastructure access and its impact. It will also offer them insights into designing policies and programs that effectively tackle gender disparities in the infrastructural development needed to empower women in agriculture. The study also provides micro-level rural women infrastructure access information, which can be deployed 4 at the macro-level for necessary collective action toward policy formulation for national growth and development.

2.0. LITERATURE REVIEW

2.1. Infrastructure as an Input of Production

Empirical studies (Sharma & Sehgal, 2010; Aymen et al., 2015) have used the production function framework to study how infrastructure influences productivity. Public goods (infrastructure) are treated as either enhancing multifactor productivity or serving as a separate input in production (externalities), with the assumption that they are exogenous. Public infrastructure is applied to aggregate production, as represented in Equation 1 below.

$$Y = Af(K, L, R) \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \qquad (1)$$

Where;
Y= Agricultural output
A=Total Factor Productivity (TFP);
K= Capital;
L= Labour and
R = stock of infrastructure (e.g., roads, education, electricity, water, etc.).

From the equation above, public goods may affect aggregate output directly, that is $\frac{\delta f}{\delta R}>0$, or through the increase of production by increasing the economy-wide productivity index (in a way like technological progress), that is, AS, with $\frac{\delta A}{\delta R}>0$. This assumes Hicks-neutral public capital, a common assumption in public capital literature (Merter, 2021). Figure 1 illustrates a typical increase in production resulting from infrastructure improvements, assuming all other factors remain constant. An increase in infrastructure from G^0 to G^1 will increase output from Q^{*1} to Q^{*0} with other factors kept constant
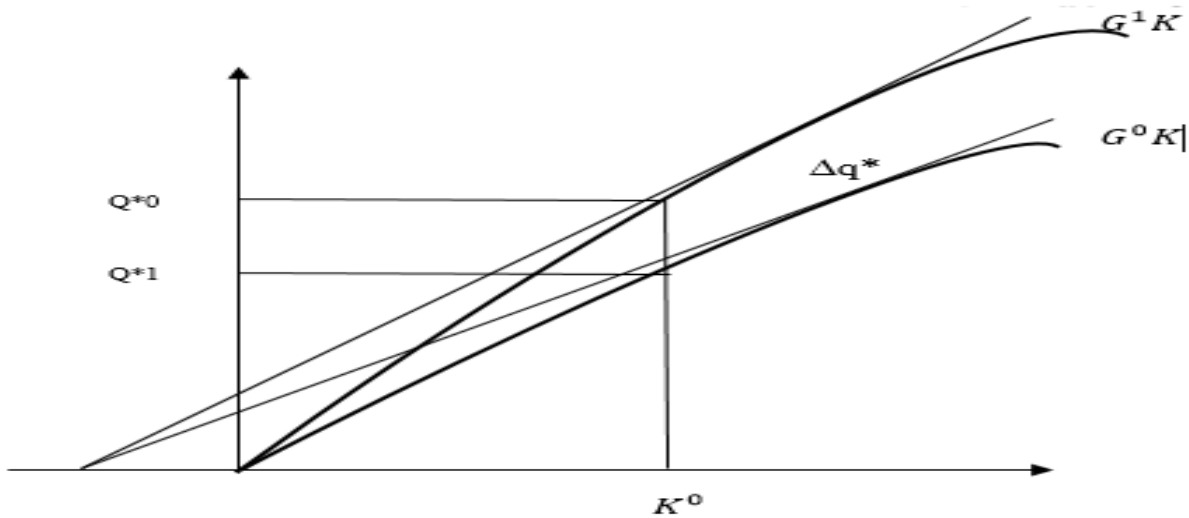
Figure 1: Increase in Production Due to Infrastructure

Additionally, infrastructure and other inputs also affect output and productivity accordingly. Output increases due to infrastructure access and other inputs is illustrated in Figure 2. An increase in the input level (from P1 to P2) and access to infrastructure caused the change of the production function from (1) to (2). The total output increase from T1 to T2 is then considered the sum of both increase indicators (Aymen *et al.,* 2015).
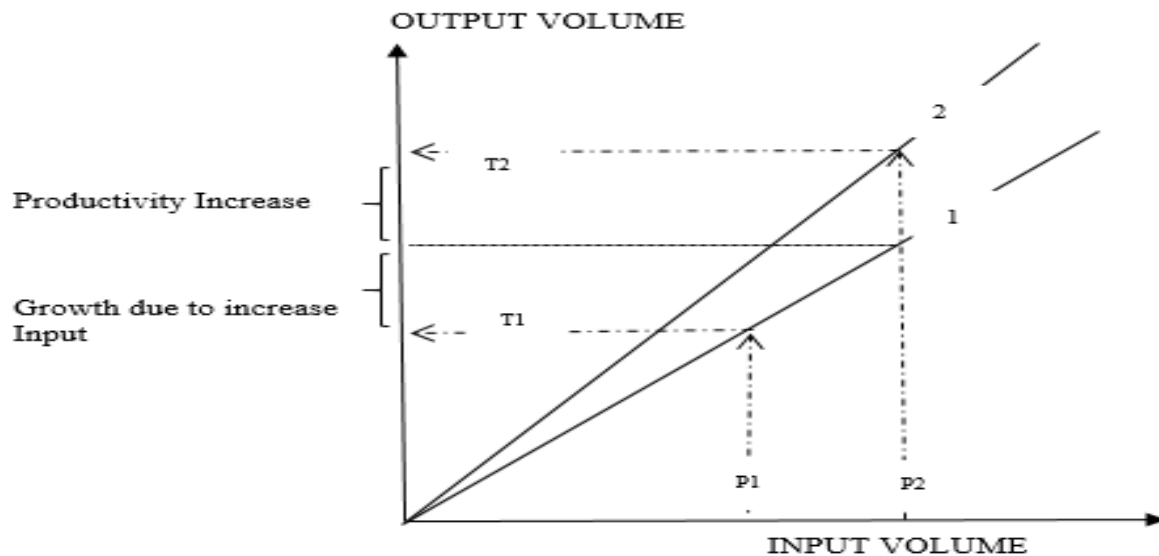
Figure 2: Increase in output due to Infrastructure and other inputs

3.0. METHODOLOGY

3.1. Study Area

The study was conducted in the Southwestern zone of Nigeria, consisting of six (6) States; Ondo, Ogun, Ekiti, Osun, Lagos, and Oyo. The region is marked by longitude 60 to the East and 40 to the West, on latitude 40 to the South and 60 to the North. Kogi and Kwara States surround it to the North, the Atlantic Ocean to the South, Edo, and Delta States to the East, and the Republic of Benin to the West. Based on proximity to each other and

geographical location, the six States are usually classified based on the contiguous delineation into 3 clusters: Lagos/Ogun Cluster, Oyo/Osun Cluster, and Ondo/Ekiti Cluster. The clusters have relative homogeneity, and rural areas are predominantly agriculture-based economies. The climate around the year in the Southwestern geopolitical zone supports about three-quarters of the populace to participate in farming (Afolabi, 2010). Various cash and food crops are grown in the area; they include tuber crops like yam and cassava; grains like rice, maize, cowpea, sorghum, and soybean; and vegetables such as pepper, okra, melon, leafy vegetables, and so on. Farmers intercrop them with mixed crops or sole crops while cultivating cash crops such as cocoa, citrus, and oil palm. The zone has a land area of about 114 271 square kilometres, representing approximately 12 per cent of Nigeria's total land mass.

Primary data were used for the study using a well-structured questionnaire administered to rural communities in Southwestern Nigeria. Data were collected on the various socio-economic characteristics of rural women, including infrastructure facilities, education, roads, water, electricity, telecommunication, storage, health, and the market. Details of women's empowerment were collected across resources, production, income, and leadership. We collected information on farm inputs and farm outputs in monetary terms to illustrate women's productive capacities. The study adopted a multistage sampling procedure. In the first stage, three states were randomly selected from the six states in the Southwestern geopolitical zone of the country; taking into consideration the relative homogeneity among the states. Osun State was selected from the Oyo/Osun cluster, Ogun State was selected from the Lagos/Ogun cluster, and Ondo State was selected from the Ekiti/Ondo cluster. The second stage involved the selection of thirty rural Local Government Areas (LGAs) from the three states, twelve

LGAs were selected from Osun, ten from Ogun, and eight from Ondo state. Twenty villages were selected across each LGA per state in the 3rd stage, totaling sixty villages.

However, the analysis deemed only 575 pieces of the questionnaire fit. 200 women farmers were selected per state and 600 women in the total sample. However, the analysis deemed only 575 pieces of the questionnaire fit.

3.4. Methods of Data Analysis

Descriptive statistics such as frequency distribution, percentages, mean, standard deviation, tables, and charts were used to profile the socio-economic characteristics of the rural women in the study area.

3.2. Composite Infrastructure Access Index (IAI)

Researchers used the composite infrastructure access index to assess women farmers' infrastructure access in the study area. They often construct composite indices by combining several variables or indicators to depict the extent to which a specified outcome or objective is achieved. An indicator is a function of many variables, directly measuring an objective's specified aspect (Chakrabartty, 2017). The infrastructure access index for this study summarizes the access indicators across eight infrastructure components, which cannot be captured by a single indicator (Nayak, 2014) since infrastructure elements are not mutually exclusive. The complex and multi-dimensional reality of infrastructure access is thus summarized to support decision-making using the access indicators of the following infrastructure components: road, electricity, telecommunication, water, storage, market, education, and health. The access indicators for each infrastructure are described in Table 1

Table 1: Composite Access Indicators across Eight Infrastructure Elements

Infrastructure Component	Access Indicators
	Improved water source
Water	Distance to the nearest water source
	Network access/coverage
Telecommunication	Ownership of a mobile telephone
Electricity	Access to public power supply
	Hours of supply of power
Transport	Access to tarred road
	Distance to the nearest road
Education	Access to available education facility
	Contact with education facility in the last 1 year
Health	Access to functional health facility
	Distance to the nearest health facility
Market	Access to market
	Type of market patronized
Storage	Access to modern storage
	Contact with modern storage in the last 1 year

Adapted from: Letsara et al., (2013), AFDB, (2013), Manoj, (2013), Baptista, (2014)

For this study, the composite infrastructure access index (IAI) was generated as adopted from Letsara *et al.* (2013); AFDB (2013); Manoj (2013); and Baptista (2014) and used to determine the women farmers' level of access to infrastructure following Manoj *et al.* (2013) in the following sets of equations.

$$SC^n_i = \sum_{i=1}^{\Lambda} I C^i_j \qquad .$$

$$IDC_i = \frac{SC^n_i}{N} \qquad \text{……………………………………} (2)$$

$$IAI = \frac{\sum_{i=1}^{n} IDC_i}{n} \qquad \text{……………………………………}(3)$$

Where:
IC =Infrastructure Component
SCi = Sum of Weighted average of each infrastructure component indicator
IDC_i=weight of 8 infratructure accesscomponent
IAI =Infrastructure Access Index
N=No of Infrastructure Components; j=1-8
n =No of Respondents ; i=1-575
The level of access among the women is thus categorized into 3 based on their access index, as stated below.
Low Access= 1st Tercile (0- 0.33)
Moderate Access= 1st Tercile (0- 0.33)
High Access= 3rd Tercile (0.68-1)

3.3 Truncated Tobit Regression

We determined the factors influencing access to infrastructure using the Tobit Regression Model.
The Tobit Model assumes that there is a latent unobservable variable Y*. This variable is linearly dependent on the Xi variables via a vector of βi coefficients that determine their interrelationships. In addition, there is a normally distributed error term Ui to capture random influences on this relationship. For the study, the observable variable Yi is defined to be equal to the latent variables whenever the latent variables are above 0.333 (that is truncated). Independent variables used include the socio-economic variables of the women farmers and the dependent variable was the infrastructure access index truncated at 0.333.
The model is expressed below in the following equations.

$$\gamma i *= \beta' xi + \varepsilon i \text{……………………………………} (5)$$
$$\gamma i = 0, if \quad \gamma i \leq 0.333 \text{……………………………} (6)$$
$$\gamma i *= \gamma i, \ if \ 0.333 < \gamma i \leq 1 \text{…………………………}(7)$$

Where $\gamma_i{}^*$ is the limited dependent variable, which represents the infrastructure access index,
γi is the observed dependent variable
Xi is the vector of independent variables

β is a vector of unknown parameters
εi is a disturbance term assumed to be independently and normally distributed with zero mean
and constant variance σ; i =1, 2, …, 16 (16 included independent variables).
The following socio-economic variables were used as independent variables.
Y = Infrastructure Access Index (dependent variable)
X_1= Age (Years)
X_2=Age square (Years)
X_3=Household size (Numbers)
X_4=Farming experience (years)
X_5=Farming practice (Animal Husbandry= 1, otherwise"=" 0)
X_6=Farming practice (mixed farming"=" 1, otherwise"=" 0)
X_7=Household head (Yes=1, No=0)
X_8=Secondary occupation (trading=1, Otherwise=0)
X_9=Secondary occupation (Artisan=1, Otherwise=0)
X_{10}=Marital Status (Divorced=1, otherwise=0)
X_{11}=Marital Status (Widowed=1, otherwise=0
X_{12}=Education (Years)
X_{13}=Paid employment (Yes= 1, No=0)
X_{14}=Credit (Credit Coop Association=1, otherwise=0)
X_{15}=Credit (Credit informal=1, otherwise=0)
X_{16}=Credit (Credit Family &friends=1, otherwise=0)

4.0. RESULTS AND DISCUSSIONS

4.1. Socio-economic Distribution of the Female Farming Households

Table 4.1 shows the socio-economic characteristics of the female farmers. The age of women is crucial in measuring their maturity and experience in handling vital economic decisions. This could indicate how strong physically or emotionally they are or will be. Table 4.1 reveals that 89.22 % of rural women farmers in Southwestern Nigeria were between 35 and 59 years, 1.74 % were between 25-34 years, and 9.04 % were above 60 years. The overall mean age was 47.7±7.1 years. This agrees with Oladokun and Adenegan (2019), who found that most women in rural households had an average age of 40 years, `and reported a relationship between age and relative achievements. The study revealed that most (67.83 %) respondents were married, 24.87 % of the women were widowed, and 7.20 % were divorced. This indicates that more women were married, and by implication, they had some responsibilities to take care of other people. Being empowered could help provide the much-needed resources required to take care of the members of their households. Jerumeh (2019) found that most rural people in Nigeria were married. The distribution of women according to educational level revealed that 19.30% of the respondents had no formal education, 67.13 % had at least primary school education, and only 13.57 % had above primary school educational attainment. This aligns with Ajayi *et al.* (2016), who reported that 82 % of women farmers have at least

primary or secondary education. Household size is particularly relevant in agriculture, given that labour is a significant input in most activities. Table 4.1 reveals that 76.52 % of respondents had a household size of 4-6 people with a mean value of 5.5 ±1.6 person, 19.30 % of the households had a size greater than 6 members, and 4.17 % had less than 4 members. This aligns with Jerumeh (2019), who reported a mean household size of 6 across rural Southwestern Nigeria. This is, however, contrary to the expected large family sizes in rural Nigeria, as earlier reported by Yusuf *et al.* (2010) and Ayodele *et al.* (2012).

The distribution of occupations among the respondents revealed that the primary occupation of most rural women in Southwestern Nigeria is farming. Most women (67.13 %) were primarily into farming, and 32.87 % were into farming plus other occupations (such as trading, artisans, and so on). These women farmers are involved in crop farming and animal husbandry; they produce food crops such as maize, cassava, vegetables, and cowpea and rear small livestock such as chickens, goats, etc. This may be because agriculture is considered the primary source of income for most people living in rural Nigeria, and agriculture employs the most significant percentage of rural people (Salman *et al.,* 2020). The mean farming experience of women farmers in Southwestern Nigeria is 19.84±7.94 years. More than half (58.78 %) of the respondents had 11-20 years of experience, 28.35 % of women farmers had more than 20 years, and 12.87 % had less than 10 years of experience. Women farmers in rural Southwestern Nigeria are relatively experienced farmers and are expected to know basic farm practices that will enhance their productivity and empowerment. This aligns with Nouman *et al.* (2013), who found that experience is a socio-economic indicator of improved performance for rural dwellers.

Regarding the size of farms cultivated by women, only 17.91 % of the rural women farmers in Southwestern Nigeria used more than 3ha. Most women (64.35 %) used between 1 and 3ha for farming, while 17.74 % used less than 1ha. This indicates that most of the rural women are smallholder farmers who produce food at the subsistence level. This is consistent with Musa (2011), who reported that many women in Kogi State are small-scale farmers and use between 1- 2ha for their farming activities. Residency status confers a relative boost to the social status of members within a community. The result indicates that 40.52 % of the women have lived in their current location for 21-30 years, 36.52 % for 11-20 years, 12.87 % for above 30 years, and 10.09 % have lived in the community for less than 10 years. It shows that most of the farmers have lived in their respective communities for at least 10 years, indicating that they should be aware of the various infrastructural facilities around them and be able to access them freely, given the resources needed.

Table 4.1. Socio-economic Characteristics of Respondents

Socio-economic Characteristics	Frequency	Percentage	Mean
Age (Years)			
25-34years	10	1.74	47.7± 7. 12
35-59 years	513	89.22	
60 years above	52	9.04	
Marital Status			
Married	390	67.83	
Divorced	42	7.20	
Widowed	143	24.87	
Educational Level			
No Education	111	19.30	
Primary Education	386	67.13	
Above primary Education	78	13.57	
Household Size			
< 4	24	4.17	5.5 ±1.6
4-6	440	76.52	
> 6	111	19.30	
Household Head			
Yes	386	65.74	
No	189	34.36	
Primary occupation			
Farming only	386	67.13	
Farming +Others	189	32.17	
Farming Experience (Years)			
≤ 10	74	12.87	19.84±7.94
11-20	338	58.78	
> 20	163	28.35	
Farm Size (Ha)			
≤1.0	102	17.74	2.64±2.60
>1.0-3.0ha	370	64.35	
> 3.0	103	17.91	
Years of Residency			
≤10	58	10.09	22.89±9.48
11-20	210	36.52	
> 20-30	233	40.52	
> 30	74	12.87	

Source: Field Survey, 2021

4.2 Level of Women Farmers' Access to Infrastructure in the Study Area

Infrastructural facilities have a remarkable impact on the pattern of socio-economic life and the development of rural areas. In addition to the positive impact of infrastructure access on rural dwellers' economic lives, it also has excellent potential for improving their well-being and welfare. The distribution of women by level of access to infrastructure in rural Southwestern Nigeria is shown in Table 4.2. The infrastructure access index was 0.61 with a standard deviation of 0.14, which indicates that women have a moderate opportunity to use infrastructure in the study area. Access was categorized into three levels based on different values.

Low access = 1st Tercile (0- 0.33)
Moderate access = 2nd Tercile (0.34- 0.67)
High access = 3rd Tercile (0.68-1)

Very few women (7.48 per cent) had high access to infrastructure, while a large population had moderate access (84.0 per cent). The infrastructure index had a mean value of 0.61, which implies that most respondents had access to infrastructure, with overall moderate access to a combination of the eight infrastructure components. Access to infrastructure will contribute to improvement in their production activities; it will reduce the cost of production and increase the revenue generated by the women farmers. Regarding specific infrastructure facilities, telecommunication was the most accessed, while storage was the least accessed. The high access to communication using mobile phones implies that women have a good chance to receive information on prices while also having seamless market information to curb the activities of middlemen and possible price volatility. Meanwhile, the low access to storage facilities exposes the women to huge post-harvest losses and reduced selling prices, amongst other inadequacies, due to the inability to store their produce properly.

Table 4.2: Distribution of Women According to Level of Access to Infrastructure

Access to infrastructure	Frequency	Percentage
Low Access Category (LAC)	49	8.52
Moderate Access Category (MAC)	483	84.00
High Access Category (HAC)	43	7.48
Total	575	100
Infrastructure Access Index = 0.61±0.14		

Source: Authors Computation, 2021

4.3 Factors Affecting Women Farmers' Access to Infrastructure

This section discusses the results of factors that affect women farmers' access to infrastructure.
The model is significant at 1 percent (P = 0.0018), with a log-likelihood of 299.69 and WaldChi (2) of 37.51, indicating that the data set fits the model. Seven variables were statistically significant from the model at 1, 5, and 10 percent. These variables are age, age squared, household size, farming experience, farming practice, marital status, and access to credit. Increasing women's age by one unit decreases access to infrastructure by 1.78 percent, a significant. This aligns with Ojo *et al.* (2012), who found a meaningful relationship between age and access to agricultural resources. As women farmers' age increases, their infrastructure access is likely to decrease. As women grow older, they become weaker and unable to undertake economic activities like they used to. They have lower needs for accessing infrastructure because they have delegated responsibilities to other household members.

Age-squared has a significant and positive relationship with access to infrastructure. A unit increase in age will lead to a likelihood of a 0.016 increase in access to infrastructure. It is significant at 10 percent. This indicates that the overall effect of age on access to infrastructure will increase with a continuous increase in farmers' age. Age square explains the life cycle effect of age on access and depicts the threshold at which we will have a decline. The coefficient of household size was negative and significant at 5%, indicating that an increase in household size will lead to a decrease in access to infrastructure by 0.0082. This agrees with Awoyemi *et al.* (2011) and Ojo *et al.* (2012), who found a significant negative relationship between household size and access to infrastructure. An increase in household size will lead to increased expenditure on meeting household needs (both consumption and material), leaving such households with limited resources that could be used to access infrastructure. A unit increase in rural women's farming years will increase infrastructure access by 0.0022, which is significant at 5%. This reveals that more experienced women have higher infrastructure access than women with lower farming experience. This may be because women with higher experience have learnt better ways of farming over time, which aligns with Ojo *et al.* (2012), who found a significant relationship between

farmer's access to resources and experience. Women engaging in animal husbandry will experience a 0.1296 increase in infrastructure access compared to those involved in other types of farming.

It is significant at 5%. This corroborates the report of Doss (2018), which stated that women carry a lot of livestock rearing around the home, which is likely to increase their income and could increase infrastructure access among the women. Additionally, Doss reported that contributions from livestock activities are significant to the total agricultural production values across farming systems. An increase in the number of divorced women compared to married ones will increase access to infrastructure by 0.0463. It is significant at 10%. This is in line with Oluwagbamila and Samson (2017). Divorced women have more control over their resources; they have fewer members of households to provide for, which may explain why divorced women have higher access to infrastructure than married women. Access to credit through cooperative associations will lead to an increase in access to infrastructure by 0.0529. It is significant at 10%. Access to credit through cooperative activities provides additional funds for women to increase their farming operations. This could increase the total amount of revenue generated by the farmers and enable women farmers to have higher access to infrastructure than women who do not have access to credit. Accessing credit through an association also means that the woman is a member of the association; this confers an additional advantage on the woman in the form of social capital. This increases their awareness about infrastructure and the knowledge and information gained from group activities, increasing their likelihood of accessing infrastructure.

Table 4: Tobit Regression Model of Factors Affecting Women Farmers' Access to Infrastructure in Southwest Nigeria.

Variables	Coefficient	Std. Err	Z	P>|z|
Age	-0.0178**	0.0090	-1.97	0.048
Age square	0.0002*	0.0000	1.77	0.077
Household Size	-0.0082**	0.0038	-2.14	0.032
Farming Experience	0.0022**	0.0009	2.31	0.021
Farming practice (Animal Husbandry)	0.1296**	0.0536	2.42	0.016
Farming practice (Mixed Farming)	-0.0158	0.0175	-0.90	0.367
Household Head (No)	-0.0119	0.0194	-0.61	0.541
Sec Occupation Trading	-0.0167	0.0165	-1.01	0.312
Sec Occupation Artisan	-0.0125	0.0260	-0.48	0.631
Marital Status (Divorced)	0.0462*	0.0257	1.80	0.072
Marital Status (Widowed)	-0.0092	0.0231	-0.40	0.69
Education	0.0082	0.0182	0.45	0.654
Wage Employment	0.0025	0.0150	0.17	0.867
Credit (association)	0.0529***	0.0190	2.78	0.005
Credit (Informal)	-0.0125	0.0335	-0.37	0.708
Credit (Family & Friends)	-0.0026	0.0323	-0.08	0.937
Constant	1.0939	0.2148	5.09	0.000
Prob > Chi^2	0.0018			
Log Likelihood	299.69			
Wald Chi^2	37.51			
Sigma	0.000			

*Source: Stata Output Note that 1% ***   5% ** 10% ***

5.0. CONCLUSION AND RECOMMENDATIONS

The mean infrastructure access index value of 0.61 means that overall, women farmers had moderate access to infrastructure using the eight components considered in this study, however, with varying access levels to each infrastructure facility. The modern storage facility was the least accessed infrastructure, followed by improved water, health, education, roads, markets, electricity, and telecommunications (GSM mobile phones) being the most accessed among the women. Older women are less likely to access infrastructure and large households, while

age and household size decrease access to infrastructure. Women who access credit through cooperative associations, more experienced farmers, women who practice animal husbandry, and divorced women are most likely to access infrastructure, as revealed by the result of the truncated Tobit Regression. Considerably, for people to have access, infrastructure facilities must be available. Government policies in rural Southwestern Nigeria should track infrastructure availability concerning access to justify the provision and level of infrastructural development in the study area. This will assist in measuring both infrastructure availability and access needed to keep improving the productivity and empowerment of women.

This study recommends that the public and private sectors collaborate in providing modern storage facilities like warehouses and silos, which would help prevent post-harvest losses and check price volatility. Through the Ministry of Agriculture, public-private partnerships should immediately roll out programmes and projects prioritizing access to storage facilities while enlightening women on the benefits of modern storage. Also, in collaboration with the Ministry of Agriculture, the government should embark on women-friendly agricultural programmes to ensure timely inputs, land for farming, access to technologies, and extension services for more women to embrace agriculture. Government intervention programmes to help farmers increase the scale of agricultural production in rural areas are required to increase food supply to the economy and to reposition the rural areas where most of the farm production in Nigeria occurs.

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