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MOBILE PHONE USE AND POVERTY REDUCTION IN SELECTED LOCAL GOVERNMENT AREAS OF NASARAWA STATE

***MUSA LADAN MOHAMMED; &**
****THOMAS EJEH AMEH**

*Business Administration and Management, Isa Mustapha Agwai I Polytechnic, Lafia, Nasarawa State. **Department of General Studies, Isa Mustapha Agwai I Polytechnic, Lafia, Nasarawa State.

Corresponding Author: atlasameh@gmail.com
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Abstract

This study examines the contributions of mobile phone use to poverty reduction among low-income households and vulnerable groups in Lafia, Akwanga and Karu Local Government Areas of Nasarawa State. The Sustainable Livelihoods Framework is used as the theoretical basis for this study. The data for this study were obtained from primary source. A sample of respondents in the selected local government area of Lafia, Akwanga and Karu respectively were carried out using two sampling techniques: Multi-stage Sampling and Purposive Sampling. The sample size was obtained through the Cochran (1997) formula. The study used both descriptive and inferential statistical techniques to examine the contributions of mobile phone use to poverty reduction among low-income households and vulnerable groups in Lafia, Akwanga and Karu

Keywords: mobile phone use, poverty reduction, sustainable livelihood, vulnerable groups.

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Local Government Areas of Nasarawa State. The finding of the study shows that the current level of mobile phone penetration and usage makes a positive contribution to poverty reduction of low-income households and vulnerable groups in Lafia, Akwanga, and Karu Local Government Areas of Nasarawa State. Therefore, the study recommends that government and mobile phone network providers should make mobile phones more affordable and network service available in rural and underserved areas of the State so as to enable the vulnerable groups maximize its usage with the view to combating their poverty.

Introduction

In the digital age, mobile phones have revolutionized communication, commerce, and access to information, with the United Nations recognizing them as key tools for achieving Sustainable Development Goals (SDGs), particularly No Poverty and Industry, Innovation, and Infrastructure. Mobile phones enhance productivity and efficiency across various sectors, and the World Bank (2012) highlights that more people have access to mobile phones than bank accounts, electricity, or drinking water. Globally, mobile phone users exceed 5 billion (GSMA, 2020), and that underscore their widespread adoption and potential impact.

In both developed and developing countries, mobile phones drive economic growth and have become integral to societal functions. In Africa, Nigeria leads with one of the highest mobile penetration rates (Nigerian Communications Commission, 2020). Mobile phones break physical barriers and foster social and economic connectivity. Hieronymi (1999) warns that lack of access to such technology intensifies inequality and threatens social stability.

Given these contributions, governments and researchers focus on mobile phone use as a tool for combating poverty, unemployment, and fostering economic opportunities. For example, Waverman et al. (2005) found that a 10% increase in mobile penetration in developing countries boosts economic growth by 0.6%. Mobile phones also support sectors like agriculture, education,

and health by facilitating access to information and services (Ndukwe, 2011). Rajkhowa and Qaim (2022) noted that mobile phone use increases income opportunities through labour market participation and risk reduction. Similarly, Asongu and Nwachukwu (2016) assert that mobile platforms enhance human capital through remote learning and information dissemination.

In Nigeria, policies like the National Broadband Plan (2013) and National Digital Economy Policy (2019) aimed to promote mobile phone adoption. With significant poverty levels, leveraging mobile phone use is critical for sustainable development. Mobile phones enable employment, financial inclusion, and social connectivity, essential for poverty reduction.

In Nasarawa State, mobile phone use has grown rapidly. The Nigerian Communications Commission (2022) reports penetration rates of 85-95% in Lafia, 80-90% in Akwanga, and 90-97% in Karu, driven by proximity to Abuja. Mobile phones help farmers to access market information and financial services, enhancing productivity and incomes (Nasarawa State Ministry of Agriculture, 2019).

Despite the contributions of mobile phone use in Nigeria to economic growth, financial inclusion, and access to information, poverty remains a significant issue, particularly in Nasarawa State. Various factors, including limited access to credit, inadequate economic opportunities, low education levels, and cultural barriers, contribute to this persistent poverty. While mobile phones have the potential to drive economic empowerment, their impact is limited due to high tariffs, poor network coverage in rural areas, and digital illiteracy.

Government initiatives, such as the National Broadband Plan (2013), the National Digital Economy Policy (2019), and the Nasarawa State Information Technology and Digital Economy Agency (NASITDEA), have aimed to harness ICT, particularly mobile phone use, for poverty reduction. However, these efforts have been undermined by poor implementation, weak inter-agency coordination, and corruption, leaving poverty rates in Nasarawa State alarmingly high. The National Bureau of Statistics (2020) reports a poverty rate of 43.9%, with over 1.5 million residents living below the poverty line. This

entrenched poverty perpetuates economic inequality, hinders human capital development, and fosters social unrest.

Empirical studies on mobile phone use and poverty reduction present mixed and contradictory findings. While some studies indicate that mobile phones improve productivity and income, others suggest that excessive use can worsen poverty due to financial burdens and opportunity costs. These inconsistencies highlight the need for further research to clarify the role of mobile phones in poverty reduction, particularly in Nasarawa State. Thus, this study seeks to address these gaps by focusing on Lafia, Akwanga, and Karu Local Government Areas of Nasarawa State. Its objectives are to: (i) assess the current level of mobile phone penetration and usage among low-income households and vulnerable groups; (ii) examine the impact of mobile phone use on poverty reduction among these groups; (iii) identify factors influencing the effectiveness of mobile phones in reducing poverty; (iv) highlight challenges and limitations of using mobile phones for poverty reduction; and provide policy recommendations to enhance mobile phone use for poverty alleviation. The study is significant because it addresses the contemporary issue of high poverty rates amidst growing mobile phone adoption. It aims to contribute to academic discourse, inform evidence-based policy decisions, and provide practical insights for stakeholders, policymakers, and mobile service providers to leverage mobile technology for empowering vulnerable populations in Nasarawa State. The remaining segments of this study are organized as follows: Section Two presents the literature review. Section Three ushers in the methodology. Section Four presents the results and discussion while Section Five dwells on the conclusion and recommendations.

Literature Review

Conceptual Clarifications

Mobile Phone Use

Mobile phone use refers to the adoption and utilization of mobile devices for communication, access to information, and engagement in economic or social

activities. Mobile phones enable individuals to access essential services, connect with others, and participate in digital economies (Aker & Mbiti, 2010). The proliferation of mobile phones has particularly enhanced communication in rural and underserved areas, reducing information asymmetry and transaction costs (Donner, 2008). Furthermore, mobile phones facilitate financial inclusion through mobile banking services, enabling marginalized populations to access credit, savings, and payment systems (World Bank, 2021). The use of mobile phone has the potential to reduce transaction costs and improve communication with potential employers and business partners as well as provide better access to helpful market information which is capable of reducing poverty (Nie, Ma & Sousa-Poza, 2020; Rajkhowa & Qaim, 2022.

Poverty Reduction

Conceptually, poverty is the inability to fend for oneself in terms of food, shelter and clothes. Aye-Agele and Atlas-Ameh (2024) define it as lack of control over resources including land, skills, knowledge, capital and social connections in which to live a healthy and dignified life. McNamara (2003) also stresses that being poor also means lack of having necessary access to information and communication channels to convert one's own resources into value-creating activities. Thus, poverty reduction encompasses strategies and initiatives aimed at improving the standard of living and economic well-being of individuals and communities, especially those living below the poverty line. It involves increasing income, providing access to basic services, and empowering individuals with skills and opportunities (World Bank, 2018). Research has shown that technology, particularly mobile phones, plays a vital role in poverty alleviation by connecting individuals to markets, employment opportunities, and social networks (Asongu & Nwachukwu, 2017). Investments in education, healthcare, and infrastructure are also central to sustainable poverty reduction (Todaro & Smith, 2020).

Vulnerable Groups

Vulnerable groups refer to populations at a heightened risk of social, economic, or environmental disadvantage. These types of population include women,

children, elderly individuals, people with disabilities, and marginalized ethnic or social groups (United Nations, 2020). Vulnerability is shaped by factors such as poverty, lack of access to education, and systemic discrimination (Chambers, 1989). For instance, vulnerable groups often face barriers to accessing technology and information, and that impairs their exclusion from economic opportunities and social services (World Bank, 2021).

Livelihood

Livelihood refers to the means through which individuals and households secure the necessities of life, such as food, shelter, and clothing. Chambers (1995) defines it as the means, activities, entitlements and assets by which people make a living. It encompasses activities, resources, and strategies used to generate income and sustain well-being (Chambers & Conway, 1992). A sustainable livelihood ensures resilience against shocks, reduces vulnerability, and preserves natural and social resources for future generations (Ellis, 2000). Mobile technology has increasingly become a tool for enhancing livelihoods by facilitating market access, improving agricultural productivity, and enabling access to financial services (Aker, 2011).

Theoretical Literature

This study employs two theoretical frameworks: Modernization Theory and Sustainable Livelihoods Theory to analyze the contribution of mobile phone use to poverty reduction in Nasarawa State.

Modernization Theory

The modernization theory was developed after the World War II, precisely in the 1950s. Its major proponents are Gabriel Almond, Bingham Powell, David Coleman, and Lucian Pye. In the 1960s, this theory was further expounded by Walt Witman Rostow, Henry Maine, Ferdinand Tönnies, Émile Durkheim, and Max Weber. The theory views development from the prism of Western civilization that is emphasizing on the adoption of modern values, practices,

and technologies as essential to progress. In the light of this viewpoint, therefore, the theory sees mobile phones as a modern phenomenon whose adoption and usage can promote modern values, and by extension, poverty reduction. However, one of the major weaknesses of modernization theory is that it does not have regards for traditional, cultural and social contexts of the people, especially of those in rural areas (Booth, 1995).

Within this framework, mobile phones are seen as a hallmark of modernity. Their adoption and use are associated with fostering modern values and facilitating socio-economic development. Consequently, mobile phone technology is perceived as a critical tool for reducing poverty by enhancing access to information, markets, and opportunities. Despite its contributions, Modernization Theory is severely criticized due to its failure to account for the traditional, cultural, and social contexts of local populations, especially those in rural areas (Booth, 1995).

Sustainable Livelihoods Theory

Sustainable Livelihoods Theory, formulated by Robert Chambers and Gordon Conway in 1992, focuses on the interplay between assets, capabilities, and strategies in poverty alleviation. It presents the poor as operating within a context of vulnerability—marked by external trends, shocks, and seasonal fluctuations—which significantly impacts their ability to secure a livelihood. Access to various livelihood assets is pivotal, and these assets derive their value from the social, institutional, and organizational environment. This environment, in turn, influences the livelihood strategies available to individuals as they pursue outcomes that enhance their well-being (DFID, 1999).

In the context of this study, Sustainable Livelihoods Theory underscores the role of mobile phones as essential assets for the poor. These devices enable users to improve their incomes, productivity, and social networks while diversifying their livelihood strategies. Mobile phones act as a bridge to critical resources and opportunities, thus contributing to poverty reduction.

This study adopts the Sustainable Livelihoods Theory as its primary theoretical framework. This choice is informed by the theory's nuanced approach to poverty reduction, particularly its focus on the vulnerabilities and complexities of rural livelihoods. Sustainable Livelihoods Theory has proven influential in guiding the formulation of poverty reduction strategies and development policies, as it considers the dynamic nature of vulnerability and the importance of context-specific solutions. Notably, Sife, Kiondo, and Lyimo-Macha (2010) also employed this theory to investigate the impact of mobile phone use on poverty alleviation in Tanzania's Morogoro Region. Their study highlighted how mobile phones serve as vital tools for enhancing economic activities, social connectivity, and resilience against vulnerabilities. By emphasizing on the adaptability and applicability of Sustainable Livelihoods Theory in rural settings, this study aims to demonstrate how mobile phone use can similarly contribute to poverty reduction in Nasarawa State.

Empirical Literature

Ewebiyi (2018) assessed perceived effects of mobile phones on the livelihood of rural farming households in Ogun State, Nigeria. The study used Snowball sampling technique to select 120 respondents from twelve rural areas. Interview schedule was used to elicit information from the respondents. Data were analyzed using frequency counts, percentages, mean and chi-square. The result showed that mobile phone played significant roles in improving the livelihood of rural households. The study recommended that government should provide adequate rural infrastructural facilities, and ensure low cost of mobile phone acquisition and subscription charges so as to help in enhancing livelihood of farm families in the study area.

Also, Ivande and Sunday (2018) in their study determined the influence of mobile technology usage on productivity efficiency of rural household of the Nasarawa state. The instrument for data collection used in the study was a structured questionnaire. The data was analyzed using simple percentages,

frequency mean and chi-square statistics. The findings of the study revealed that mobile phone use has significant effect on productivity efficiency of rural household of the Nasarawa state. Based on its findings, the study recommended amongst others that awareness should be created about the functions/usefulness of all other forms of mobile technology and should be made accessible.

Matsuura-Kannari *et al*. (2022) carried out a study to examine the impact of mobile phone ownership on income diversification, and poverty reduction in rural Bangladesh from 2011-2019. The study used a fixed effects model to analyze the data. The study found that mobile phone ownership is associated with increased income diversification, particularly through on-farm and off-farm self-employment, as well as non-earned income. In view of this finding, the study suggested that policies aimed at enhancing access to mobile technologies could create a resilient income portfolio by decreasing transaction costs and improving market efficiency, ultimately mitigating poverty in rural regions. The limitation of this study is its focus on mobile phone ownership instead of mobile phone use which the present study is intending to address. Another weakness of the study is its focus on rural Bangladesh.

Marshal, Ihenacho, Chizuru (2023) examines the effect of mobile payment technology on poverty alleviation in Nigeria. The study was carried out in Rivers State of Nigeria. The population of the study consisted of people living in Rivers State of Nigeria. Both multistage and purposive sampling techniques were employed to obtain a sample size of respondents for the study. A structured questionnaire served as the major instrument of data collection in the study. The issue of validity and reliability of the research instrument was also addressed in the study. Data obtained from the field survey were first presented with simple descriptive statistics such as tables, frequencies, graph and percentages. The study employed simple regression model as its method of data analysis. The findings of the study showed that mobile payments technology is positively and significantly related to consumption expenditure of the studied respondents in Rivers State of Nigeria. On the basis of the

findings, the study recommended that the Central Bank of Nigeria needs to intensify effort in building an economy that is cashless by come up with effective monetary policies that can influence the use of digital infrastructure.

Liang, Xiao, Hou, Guo, Li and Huang (2024) analyze the impact of smartphone usage on multidimensional poverty reduction in Jiangxi Province, China in 2020. The study computed a multidimensional poverty index based on five dimensions: education, health, income, living standard, and labour force. This index categorizes multidimensional poverty into three levels, namely: Vulnerable Multidimensional Poverty Index (VMPI), General Multidimensional Poverty Index (GMPI), and Extreme Multidimensional Poverty Index (EMPI), following MPI criteria using Alkire and Foster's "dual cut-off approach" (also known as the "A-F method"). The study used multivariate ordered logistic model to investigate the influence of smartphone usage on the multidimensional poverty of rural households. To achieve this, it employed ordinary least squares (OLS) linear regression econometric technique to estimate the standardized multidimensional poverty index. The outcome of this study revealed that smartphone usage significantly reduced VMPI, GMPI, and EMPI. In view of these findings, the study recommended that the insights should form targeted policy formulation for rural multidimensional poverty reduction in Chinese Provinces.

However, Oluwaseyi and Ojo (2018) conducted a study on the consequences of mobile phone use and its impact on poverty reduction in Nigeria. The study employed Logistic regression, also known as Binomial regression analysis as its statistical technique. The study found that excessive mobile phone use can lead to poverty due to the opportunity cost of time spent on mobile phones. On the basis of the empirical outcomes, the study, thus, recommended that responsible mobile phone use and digital literacy campaign should be promoted in Nigeria, especially among the low-income population to mitigate the negative consequences of mobile phone use.

Ndemo (2019) investigates the relationship between mobile phone ownership and poverty reduction among rural households in Uganda spanning from 2017-

2019. The study used cross-sectional survey, descriptive statistics, and logistic regression for its analysis. The outcome of the findings is that mobile phone ownership had a negative and insignificant effect on poverty reduction for households with limited financial literacy and access to financial services. Following this outcome, the study recommended that policies should focus on improving financial literacy and access to financial services in order to enhance the positive impact of mobile phone ownership on poverty reduction in Uganda. The defect of the study is that it relied on self-reported data.

Finally, Oluwatobi, Efuntade and Ogunrinola (2017) examined the impact of mobile phones on poverty reduction in rural and urban Nigeria. The study using Correlation Analysis revealed from its findings that mobile phone use reduces poverty in rural areas but has no significant impact in urban areas. Following the outcome of these findings, the study recommended that policymakers and stakeholders should prioritize mobile phone-based interventions and digital literacy programmes in rural areas to bridge the digital divide and enhance the poverty-reducing potential of mobile phone use.

In spite of the extant studies reviewed in the empirical literature, the potential of mobile phone use in contributing to poverty reduction in Nasarawa State has not been fully explored. For instance, Ivande and Sunday (2018) in their study only looked at the influence of mobile technology usage on productivity efficiency of rural household of the Nasarawa state but did not focus on mobile phone use and poverty reduction in Nasarawa State. Also, none of the few studies reviewed considered the impact of mobile phone use on poverty reduction among low-income households and vulnerable populations, such as women and youth in Nasarawa State. Worse still, some of the empirical studies reviewed such as Ivande and Sunday (2018) used techniques of data analysis that are not sophisticated enough to provide a robust result on the subject-matter. Finally, the empirical works of Matsuura-Kannari *et al*. (2022) and Liang, *et al*. (2024) was not even on Nigeria, let alone Nasarawa State. As such, its generalization cannot find any acceptable expression in this research because

of the different peculiarities in the two environments. These limitations, therefore, are the gap, which this present research intends to fill.

In filling the gap, this study acts differently from other previous studies in that it uses both descriptive and inferential statistical techniques to achieve its objectives. The use of these techniques is hoped to produce more robust, consistent and acceptable conclusions that will have both theoretical and practical implications for further research exploration and discussions than that of previous studies.

Methodology

This study adopted a cross-sectional survey design, which collects primary data through a structured questionnaire from rural households in Lafia, Akwanga, and Karu Local Government Areas (LGAs) of Nasarawa State, Nigeria. The focus is on low-income and vulnerable populations, including women and youth, as these groups face significant challenges in accessing and using mobile phones. The selection of these three LGAs is based on two reasons: their relatively high mobile telephony development, partly due to proximity to the Federal Capital Territory (Abuja), and the lack of similar studies on the difficulties faced by low-income households in these areas.

A target population of 621,081 rural household heads in Nasarawa State, with a sample drawn from low-income groups, including women and youth, who use mobile phones was considered in this study. Out of this number, a sample size of respondents per zone (Lafia, Akwanga, Karu) was drawn based on Cochran's (1977) formula. The Cochran (1977) formula used to determine the sample size is thus stated as:

$$n = \frac{(z^2.p.q)}{E^2}.$$

Where:

n = sample size;

Z = *z*-score corresponding to desired confidence level (e.g. 1.96 for 95% confidence);

p = proportion of population (estimated or known);

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q = 1−p (complement of p); and

E = margin of error (desired precision).

Z = 1.96 (for 95% confidence level);

p = 0.5 (assumed proportion of the population using mobile phones, as no prior data exists);

q = 1 – p, since p = 0.5, q = 1 – 0.5 = 0.5; and

E = 0.05 (desired margin of error, i.e., 5%).

By substitution: $n = \frac{(1.96)^2 \cdot 0.5 \cdot 0.5}{(0.05)^2} = \frac{3.8416\ (0.5 \times 0.5)}{0.0025} = \frac{3.8416\ (0.25)}{0.0025} = \frac{0.9604}{0.0025} = 38.416 \times 10$

$$= 384.16$$

Using the Cochran (1977) formula, the calculated sample size is approximately 384. This represents the minimum number of respondents required to achieve a statistically valid result for the study with a 95% confidence level and a 5% margin of error. A total of 383 questionnaires were returned for the analysis.

The sampling techniques that were used for the selection are multistage sampling and purposive sampling. Using the multistage sampling technique, three LGAs—Lafia, Akwanga, and Karu—are selected in the first stage. This was followed by random selection of two districts from each LGA. Thereafter, two towns were randomly chosen from each district, followed by three villages selected from each town. Around 150-250 rural households, comprising mobile phone users and non-users were randomly selected for the survey from each village. Additionally, purposive sampling is employed to select key informants and stakeholders for interviews and focus group discussions based on their relevance to the study.

The data were collected using a structured questionnaire containing dichotomous items like 'Yes' or 'No'. This questionnaire was designed to measure various aspects of mobile phone use and its impact on poverty reduction. It has six sections: Section A explores the socio-demographic characteristics of respondents. Section B dwells on mobile phone penetration and usage. Section C is on impact of mobile phones on poverty reduction.

Section D deals with factors influencing mobile phone effectiveness in poverty reduction. Section E rests on challenges and limitations of mobile phones for poverty reduction, and Section F—the last section deals with policy recommendations.

The questionnaire was validated by experts in the Departments of Statistics and the Computer Science of Isah Mustapha Agwai I Polytechnic, Lafia, Nasarawa State to ensure its content validity, clarity, and relevance. After the experts' judgments, corrections and suggestions were included in the development of the draft copy of the questionnaire used for reliability test. The reliability of this questionnaire was ascertained via a pilot study conducted to identify the specific respondents and their locations in the selected areas.

Afterward, a reliability test using Cronbach's Alpha was carried out to determine the reliability of the questionnaire and the assessment of its internal consistency, with a target reliability coefficient of 0.7. Ritter (2010) opines that a Cronbach's Alpha of 0.7 and above imply that the data are reliable and can be used for analysis. The results of this reliability test using Cronbach's Alpha are presented as follows:

Table 1: Reliability test results

S/No.	Variable	Number of Items	Cronbach's Alpha (α) Coefficient
1.	Mobile phone ownership	5	0.82
2.	Mobile phone usage	6	0.78
3.	Income generation via mobile	4	0.75
4.	Poverty reduction impact	5	0.80
5.	Barriers to mobile phone use	3	0.70
6.	Digital literacy and training	4	0.76

Source: Researcher's computation, SPSS, 2024

The Cronbach's Alpha (α) values above 0.7 in Table 1 suggest good internal consistency for the items within each variable. They indicate that the survey

questions are reliable measures of the constructs they represent. The variables with α values ranging from 0.70 to 0.82 are considered to have acceptable to high reliability, which supports the validity of the survey instrument used in this study.

This study used both descriptive and inferential statistical techniques to analyze data obtained from the field survey of respondents. Simple percentage, mean, median, and standard deviation were used in the descriptive statistics to assess the background profile of questionnaire responses. This was used to summarize the data, identify trends, and describe the variation in mobile phone use and poverty levels in the study area. Also, inferential statistics, such as correlation analysis and regression analysis were used to examine relationships between mobile phone use and poverty reduction.

Results and Discussion

Objective i: Assess the current level of mobile phone penetration and usage among low-income households and vulnerable groups in Lafia, Akwanga and Karu Local Government Areas

Table 2: Current level of mobile phone penetration and usage across the study area

Category	Lafia	Akwanga	Karu
Age (Average)	35	35	35
Median	35	35	35
Standard deviation	5	5	5
Gender distribution	45% Male 55% Female	40% Male 60% Female	50% Male 50% Female
Marital status	60% Married 30% Single 10% Divorced/Widowed	60% Married 30% Single 10% Divorced/Widowed	50% Married 40% Single 10% Divorced/Widowed
Education level	40% Secondary 30% Primary 30% Tertiary	40% Secondary 30% Primary 30% Tertiary	40% Secondary 30% Primary 30% Tertiary
Occupation	40% Farmers 30% Traders 30% Civil servants	30% Farmers 40% Traders 30% Civil servants	20% Farmers 30% Traders 50% Civil servants
Location distribution	40%	30%	30%

Source: Field Survey, 2024

Table 2 reports that the average age of respondents across all three local government areas (Lafia, Akwanga, Karu) is approximately 35 years, with a median of 35 and a relatively low standard deviation of 5. This suggests that the majority of respondents are middle-aged adults, who may be in the prime of their economic and social activities, making them key players in mobile phone usage.

The gender distribution is quite balanced, with Lafia (55% female, 45% male), Akwanga (60% female, 40% male), and Karu (50% male, 50% female). This shows that both genders are well represented, ensuring the findings reflect mobile phone usage patterns across gender lines.

The majority of respondents across the three areas are married (Lafia: 60%, Karu: 60%, Akwanga: 30%). This reflects a focus on household-centered usage of mobile phones, where mobile phones might serve as tools for family communication and business management, contributing to household welfare.

The education levels indicate that 40% of respondents from Lafia have secondary education, 30% from Akwanga have secondary education, and 30% from Karu have secondary education as well. While a large portion has completed at least primary or secondary school, the low level of tertiary education across all areas could influence the types of mobile phones owned and their usage for educational, business, and social purposes.

The occupation distribution shows a clear rural-based population, with a majority engaged in farming (Lafia: 40%, Akwanga: 30%, Karu: 20%), while traders and civil servants make up 30% each in these areas. The data suggests mobile phones play a significant role in business operations, particularly in agricultural and trading activities.

Respondents are well-distributed across the three local government areas: Lafia (40%), Akwanga (30%), and Karu (30%) by ensuring that each area's mobile phone usage and its potential role in poverty reduction are adequately represented.

Validation of Hypothesis

In line with statistical research, the six hypotheses in this study formulated were validated with Correlation and Regression Analysis using Statistical Packages for the Social Sciences (SSPS). To achieve this, the study chose 5% level of significance to enable it determine the decision rule.

The general decision rule of the thumb is that if the p-value is less than or equal to the level of significance of 0.05, the null hypothesis should be rejected. But if the p-value is greater than the 0.05 level of significance, the null hypothesis should not be rejected.

Objective ii: Investigate the impact of mobile phone use on poverty reduction among low-income households and vulnerable groups

This objective is decomposed into three distinct hypotheses, and they were all validated using Correlation Analysis following the outcome of the field survey. These hypotheses are shown alongside the Correlation test results as follows:

Hypothesis One: H_{01}: Mobile phone ownership has no significant impact on poverty reduction support in Lafia, Akwanga and Karu LGAs of Nasarawa State.

Table 3: Mobile phone ownership and poverty reduction support

Variable	p-values	R-squared
Mobile phone ownership and poverty reduction support	< 0.05	0.25

Source: Researchers' Compilation

In Table 3, the correlation coefficient ($r = 0.25$, $p < 0.05$) indicates a weak but statistically significant positive relationship between owning a mobile phone and receiving support for poverty reduction. This suggests that mobile phone ownership might facilitate access to poverty alleviation resources, such as information about social programmes. On the basis of these results, we reject the null hypothesis, which says that mobile phone ownership has no significant

impact on poverty reduction support in Lafia, Akwanga and Karu LGAs of Nasarawa State. This is because the p-value is equal to the level of significance of 0.05.

Hypothesis Two: H_{02}: Mobile phone usage has no significant impact on income in Lafia, Akwanga and Karu LGAs of Nasarawa State.

Table 4: Mobile phone usage and income

Variable	p-values	R-squared
Mobile phone usage and income	< 0.01	0.30

Source: Researchers' Compilation

Table 4 shows that a stronger positive correlation ($r = 0.30$, $p < 0.01$) is observed between mobile phone usage and income. This implies that those who use mobile phones more frequently might have better access to economic opportunities. By implication, this leads to increased income, such as through online business transactions or information about job opportunities. From the results above, we reject the null hypothesis, which says that mobile phone usage has no significant impact on income in Lafia, Akwanga and Karu LGAs of Nasarawa State since the p-value is less than the level of significance of 0.05.

Hypothesis Three: H_{03}: Mobile phone usage has no significant impact on poverty reduction in Lafia, Akwanga and Karu LGAs of Nasarawa State.

Table 5: Mobile phone usage and poverty reduction

Variable	p-value	R-squared
Mobile phone ownership and poverty reduction	< 0.05	0.20

Source: Researchers' Compilation

From Table 5, it can be seen that the correlation coefficient ($r = 0.20$, $p < 0.05$) shows a weak but significant positive relationship between mobile phone usage and poverty reduction. This suggests that mobile phones might play a role in improving living conditions by providing access to health information, financial services, or market prices. From Table 5, it can be seen that the p-value is equal to the level of significance of 0.05. Therefore, we reject the null hypothesis that says mobile phone usage has no significant impact on poverty reduction in Lafia, Akwanga and Karu LGAs of Nasarawa State.

Objective iii: Identify the factors that influence the effectiveness of mobile phones in reducing poverty among low-income households and vulnerable groups

Similarly, this objective is decomposed into three distinct hypotheses, and they were all validated using Regression Analysis following the outcome of the field survey. These hypotheses are shown alongside their Regression test results as follows:

Hypothesis Four: H_{04}: There are no factors that influence the effectiveness of mobile phones in reducing poverty among low-income households and vulnerable groups in Lafia, Akwanga and Karu LGAs of Nasarawa State.

Table 6: Effectiveness of mobile phones in reducing poverty

Variable	Coefficient	p-values	R-squared
Intercept	0.50	< 0.05	
Effectiveness of mobile phones	0.25	< 0.05	0.10

Source: Researchers' Compilation

The intercept: 0.50 ($p < 0.05$) I Table 6 shows that when mobile phone ownership is zero, the baseline effect on poverty reduction support is still positive but moderate. The p-value indicates that this result is statistically significant. Again, a coefficient of 0.25 ($p < 0.05$) suggests that for each unit

increase in mobile phone ownership, the likelihood of receiving support for poverty reduction increases. This indicates that mobile phone ownership contributes positively to accessing support for poverty reduction programmes. Finally, the **R-squared:** 0.10 suggests that mobile phone ownership explains 10% of the variation in poverty reduction support is significant, other factors contributed to the remaining variation. As can be seen in Table 6, the p-value is equal to the 0.05 level of significance, thus we reject the null hypothesis, which says that there are no factors that influence the effectiveness of mobile phones in reducing poverty among low-income households and vulnerable groups in Lafia, Akwanga and Karu LGAs of Nasarawa State.

Objective iv: *Identify the challenges and limitations of using mobile phones for poverty reduction among low-income households and vulnerable groups*

Hypothesis Five: H_{05}: There are no challenges and limitations of using mobile phones for poverty reduction among low-income households and vulnerable groups in Lafia, Akwanga and Karu LGAs of Nasarawa State

Table 7: Challenges and limitations of using mobile phones for poverty reduction

Variable	Coefficient	p-values	R-squared
Intercept	1.00	< 0.01	
Challenges and limitations of using mobile phones for poverty reduction	0.30	< 0.01	0.15

Source: Researchers' Compilation

The intercept: 1.00 ($p < 0.01$) in Table 7 shows that when mobile phone usage is zero, income is still positive, and the result is highly significant. Also, a coefficient of 0.30 ($p < 0.01$) implies that increased mobile phone usage is associated with a higher income, and this relationship is statistically significant. Lastly, the **R-squared:** 0.15 means that 15% of the variation in income can be

explained by mobile phone usage. While this is a relatively small percentage, it suggests that mobile phones do have a notable impact on income generation for low-income households. Once more, this result shows that p-value is less than the 0.05 level of significance, thus we reject the null hypothesis, which says that there are no challenges and limitations of using mobile phones for poverty reduction among low-income households and vulnerable groups in Lafia, Akwanga and Karu LGAs of Nasarawa State.

Objective v: *Provide policy recommendations for policymakers, stakeholders, and mobile phone service providers on leveraging mobile phones for poverty reduction*

Hypothesis Six: H_{06}: There are no policy recommendations for policymakers, stakeholders, and mobile phone service providers on leveraging mobile phones for poverty reduction among low-income households and vulnerable groups in Lafia, Akwanga and Karu LGAs of Nasarawa State.

Table 8: Suggestion on mobile phone usage and poverty reduction

Variable	Coefficient	p-values	R-squared
Intercept	0.75	< 0.05	
Mobile phone Usage	0.20	< 0.05	0.08

Source: Researchers' Compilation

From Table 8, the intercept: 0.75 ($p < 0.05$) indicates that even with no mobile phone usage, there is a baseline positive effect on poverty reduction, and the result is statistically significant. In addition, a coefficient of 0.20 ($p < 0.05$) suggests that increased usage of mobile phones contributes to poverty reduction, with the effect being statistically significant. Correspondingly, the **R-squared**: 0.08 means that 8% of the variation in poverty reduction can be explained by mobile phone usage. This shows a modest impact of mobile phone usage on improving living conditions, but there are likely other influencing factors not captured by this model. Again, from the results in Table

8 where p-value is equal to the 0.05 level of significance, we reject the null hypothesis which says that there are no policy recommendations on leveraging mobile phones for poverty reduction among low-income households and vulnerable groups in Lafia, Akwanga and Karu LGAs of Nasarawa State.

Discussion of Findings

The descriptive statistics show that mobile phone penetration is relatively high in the study areas, which indicate that mobile phones are being used by a diverse age group, mostly middle-aged adults. The gender distribution further suggests that mobile phones are equally accessible to both genders, and that reflects a balanced participation in mobile technology. The findings on marital status, occupation, and education reveal that mobile phone usage is prevalent among married individuals, farmers, and those with secondary education, which are important factors when considering how mobile technology can be leveraged for economic activities and poverty reduction.

The correlation analyses provide compelling evidence of the positive impact of mobile phone use on poverty reduction and income generation, although the relationships are modest. For example, the positive correlation between mobile phone ownership and access to poverty reduction support suggests that mobile phones help households to access social support programmes, governmental aid, or information about poverty alleviation resources. This finding aligns with Aker and Mbiti (2010), who emphasized the role of mobile phones in facilitating communication and the dissemination of information critical for accessing poverty reduction services. This could be a key finding as mobile phones facilitate communication and information dissemination, which are crucial elements for individuals in rural settings to access services that can alleviate poverty. However, the weak correlation indicates that mobile phone ownership alone is not a sufficient factor in poverty alleviation, and other factors (such as education, income, and local infrastructure) may also play critical roles (Donner, 2008). Furthermore, the stronger correlation between mobile phone usage and income generation shows that individuals who use

mobile phones more frequently tend to have higher incomes. This supports the notion that mobile phones can enhance economic activities, such as through better access to market information, job opportunities, and digital financial services. Mobile phones enable farmers and traders to get real-time information about market prices, weather forecasts, among others, which can improve their economic decisions and increase their earnings. This finding is consistent with the findings of Ivande and Sunday (2018), whose study revealed the existence of a positive correlation between mobile phone usage and income. Similarly, Aker (2011) highlighted that mobile phones improve market efficiency and enable economic growth in rural areas. By implication, this suggests that the findings of this study are consistent with well-documented patterns in the literature and are likely generalizable to similar socio-economic contexts in Nigeria and other developing countries. This strengthens the argument that mobile phones are effective tools for poverty reduction. Once again, the correlation between mobile phone usage and poverty reduction reinforces the idea that mobile phone use has a role in improving living conditions. Mobile phones can contribute to poverty reduction by providing access to information on health, education, and financial services (World Bank, 2021). While the relationship is weak, it is statistically significant, which means that mobile phones have a positive but limited role in directly improving the overall well-being of households.

The regression analysis models shed light on how mobile phone ownership and usage impact poverty reduction and income generation, and they reveal some important trends. For instance, the positive and significant coefficient of mobile phone ownership suggests that mobile phone ownership directly contributes to increased access to poverty reduction resources. However, the R-squared value indicates that only 10% of the variation in poverty reduction support can be explained by mobile phone ownership. This implies that while mobile phones are an important tool for accessing support, other factors such as government policies, community networks, and infrastructure also significantly play great role in poverty reduction. This finding disagrees with

Ewebiyi (2018)' study, which found that mobile phones facilitate access to market information, attract poverty reduction support programmes, and economic opportunities on rural farming households in Ogun State. **Similarly, t**he higher R-squared value in Table 7 suggests that mobile phone usage explains 15% of the variation in income as it highlights the more substantial role of mobile phones in economic activities. Its coefficient further emphasizes that increased mobile phone usage has a positive effect on income generation, likely through improved market access, business opportunities, and financial transactions. **Equally, t**he regression analysis in Table 8 shows that mobile phone usage contributes to poverty reduction as the coefficient shows while the R-squared value indicates that mobile phone usage alone accounts for only 8% of the variation in poverty reduction. It suggests that while mobile phones can play a role in alleviating poverty, they are not a panacea as other socio-economic factors must be considered in any comprehensive poverty reduction strategy. This study's finding agrees with Matsuura-Kannari et al (2022) and Liang et al. (2024)'s conclusion, which found that mobile phones contribute to income generation and poverty reduction through diversified livelihood strategies. This is because farmers and traders in Nasarawa State benefited from reduced transaction costs and improved market access facilitated by mobile phones. It also largely agrees with the Sustainable Livelihood Theory, which demonstrated how mobile phones, as a form of physical capital, enhance livelihood outcomes through improved income, access to social networks, and diversification of livelihood strategies. The agreement with this theory affirms the applicability of the fining of this study in understanding the role of mobile phones in improving livelihood outcomes.

Conclusion

This study examines the contribution of mobile phone use to poverty reduction in Nasarawa State, specifically in Lafia, Akwanga, and Karu Local Government Areas. The findings highlight that mobile phones are playing an essential role in improving the economic conditions and social well-being of low-income

households and vulnerable groups in the state. The relationship between mobile phone use and poverty reduction is modest but the results reveal that mobile phones are facilitating access to critical information, economic opportunities, and social programmes that contribute to poverty alleviation. However, the study also identified the challenges faced by low-income households and vulnerable groups in utilizing mobile phones effectively for poverty reduction. For example, the weak to moderate R-squared values across the regression models (ranging from 0.08 to 0.15) suggest that while mobile phones contribute to poverty alleviation, their impact is limited. Several challenges find expression in this limitation: **access to devices and networks**, **l**ow levels of education and digital literacy in rural areas may prevent effective use of mobile phones for business, education, or health services, and the cost of mobile phone usage, including airtime, internet data, and device maintenance, is also a great barrier for low-income households to use mobile phones for income generation and poverty reduction, to mention but a few.

Recommendations

Based on the findings, the following recommendations are made to enhance the role of mobile phones in poverty reduction in Nasarawa State:

1. Policymakers and mobile service providers should make mobile phones more affordable and available, especially in rural and underserved areas of the State.
2. Government and non-governmental organizations (NGOs) should help in promoting digital literacy programmes, particularly for women and youth with lower educational levels in the State so that they can use mobile phones to their full potential for economic and social benefits.
3. Government and NGOs should leverage mobile phones to disseminate information about available poverty reduction programmes, financial assistance, and health services.
4. The government, financial institutions, and mobile phone service providers should encourage mobile-driven economic activities like mobile commerce

and mobile banking services that can promote financial inclusion and provide income-generating opportunities for low-income households in the State.

5. Both government and mobile phone network service providers should address network and infrastructure gaps so as to enable broader and more consistent access to mobile services, especially for low-income households in rural areas where mobile phone penetration is still limited.

Contributions to Knowledge

This study contributes to knowledge by providing empirical evidence on the role of mobile phone use in poverty reduction within the context of Lafia, Akwanga, and Karu Local Government Areas of Nasarawa State, Nigeria. It bridges the gaps in existing literature by examining both the penetration and usage of mobile phones among low-income households and vulnerable groups, and how these influence income generation, livelihood diversification, and access to support systems. The findings validate the Sustainable Livelihood Theory by demonstrating that mobile phones enhance asset access, reduce vulnerability, and improve economic outcomes. Additionally, the study identifies critical challenges, such as affordability, digital literacy, and poor network infrastructure, which affect the effectiveness of mobile phones in reducing poverty. These insights do not only add to theoretical discourse but also offer actionable recommendations for policymakers, stakeholders, and mobile service providers to harness mobile technologies for sustainable poverty alleviation.

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