



ASSESSMENT OF ICT AND SOCIAL MEDIA UTILIZATION AMONG FISH SELLERS IN SABON GARI MARKET FOR ENHANCING DIGITAL INNOVATION IN FISH MARKETING

¹Attahir, M., ¹Ibrahim, H., ¹Muazu, K., ¹Said, A. S., ²Ilyasu, F. B. and ³Rano. B. Y.

¹Department of Agricultural Extension and Management, Audu Bako College agriculture Dambatta, Kano State, Nigeria.

²Department of Pest Management Technology, Audu Bako College agriculture Dambatta, Kano State, Nigeria.

³Department of Economics, Rabi Musa Kwankwaso College of advanced and Remedial Studies, Tudun Wada, Kano State, Nigeria.

Corresponding Authors' Email: muhammadattahir56@gmail.com, **GSM:** 07067078888.

ABSTRACT

The study examined the utilization of Information and Communication Technology (ICT) tools and social media platforms among fish sellers in Sabon Gari Market, Kano State, Nigeria, with the aim of enhancing digital innovation in fish marketing. A multi-stage sampling technique was employed to select 130 respondents. Data were collected using a well-structured questionnaire and analyzed using descriptive and inferential statistics. The results revealed that 70% of respondents were aged between 41–50 years, 73.3% were male, and 87.7% were married. Majority (70.2%) had completed secondary education, while 86.9% were members of cooperative societies. Most 81.1% of the respondents earned between ₦50,000 to ₦100,000 monthly. ICT adoption was moderate (66.9%), with digital scales (36.2%), POS machines (33.1%), and smartphones (29.9%) being the most commonly used tools. WhatsApp was the most widely used social media platform for communication with customers (69.3%), while its usage for online sales and marketing was limited. Logistic regression results showed that WhatsApp usage significantly enhanced business performance ($\text{Exp}(B) = 5.276$, $p < 0.01$), whereas TikTok and Twitter/X negatively influenced utilization. Major barriers to adoption included inadequate awareness (36.2%), limited digital skills (33.1%), and high device costs (18.9%). The study concludes that although ICT and social media have potential to enhance fish marketing efficiency, adoption remains constrained by digital illiteracy and infrastructural challenges. It recommends targeted digital literacy training, subsidized ICT devices, and gender-inclusive interventions to promote equitable participation and digital innovation among fish sellers.

Keywords: ICTs, Adoption, Fish, Marketing, Digital, Innovation

INTRODUCTION

Fish is a critical protein source globally, contributing 17% of animal protein intake and supporting over 540 million livelihoods, particularly in developing countries (FAO, 2022). In Nigeria, the fisheries sector produces 759,000 tonnes annually, contributing 0.5% to GDP, yet faces inefficiencies like 30–40% post-harvest losses and limited market information access (NBS, 2017; Liverpool-Tasie *et al.*, 2021). ICT and social media offer transformative potential by improving market transparency and reducing intermediary costs, as evidenced by a 20–30% income increase in Kenya's fisheries (Nandi *et al.*, 2012). However, adoption in northern Nigeria's informal markets, such as Sabon Gari Market, remains low due to infrastructural deficits and low digital literacy, particularly among female traders (Adeyemi *et al.*, 2025). This study assesses ICT and social media utilization among fish sellers in Sabon Gari Market, addressing socioeconomic characteristics, adoption levels, usage patterns, and barriers to inform scalable digital interventions. Fish sellers in Sabon Gari Market face high post-harvest losses (30–40%), volatile prices, and intermediary reliance, eroding profit margins (Adikwu *et al.*, 2020). Despite ICT's potential to enhance efficiency, adoption is hindered by limited digital literacy, unreliable internet, and gender disparities (Oke *et al.*, 2021). The lack of localized research on digital tool use in this market limits targeted interventions, threatening economic sustainability and food security (FAO, 2022). The study aims to:



- i. Analyze socioeconomic characteristics of the respondents.
- ii. Determine ICT adoption levels.
- iii. Examine social media utilization for marketing.
- iv. Identify constraints to ICT and social media adoption.

The study focuses on fish sellers in Sabon Gari Market, examining ICT (e.g., smartphones, POS machines) and social media (e.g., WhatsApp, LinkedIn) use. Limitations include geographical focus, potentially limiting generalizability, and sample size constraints, which may introduce selection bias toward the study (Oke *et al.*, 2021; Adeyemi *et al.*, 2025).

METHODOLOGY

Description of the Study Area

The study was conducted in Kano State, Nigeria, a region with a rich history of freshwater fish trading due to abundant water bodies (Rim, 1992). Located between latitude 10°33'N–12°37'N and longitude 7°40'E–9°29'E in the Sudan Savannah zone, Kano State spans 20,709 km² with mean temperatures of 33.1°C (maximum) and 15.85°C (minimum). Bordered by Katsina, Jigawa, Bauchi, and Kaduna States, it had a population of 9,383,682 in 2007, primarily Hausa and Fulani, with a 3.3% annual growth rate (NPC, 2006). Agriculture, including fishing and fish marketing, is the primary economic activity, with major crops like millet, sorghum, and rice, and livestock rearing also prominent. Sabon Gari Market, one of 16 fish markets in the state, operates daily and serves as a major hub for smoked and dried fish, alongside non-farm activities like construction that supplement incomes for 20% of the population (Rim, 1992).

Sampling Procedure

A multi-stage random sampling technique was employed to select 130 fish sellers from a sampling frame of 193 across four locations in Sabon Gari Market: Galadima (85), Yankura (52), Ibo Road by Market (30), and France Road (26). The sample size was determined using Yamane's (1967) formula at a 5% precision level ($e = 0.05$):

Total population (sampling frame) $N = 85 + 52 + 30 + 26 = 193$

Yamane's formula

$$N = \frac{N}{1 + Ne^2} \text{----- (1)}$$

$$n = 193 / 1 + 193(0.05)^2 = 193 / 1.4825 = 130.2$$

where

n = number of sample size

N = number of sample frame

e = precision

Proportionate allocation to locations.

Each location's sample n_i was calculated as

$$n_i = \frac{N_i}{N} \times n \text{----- (2)}$$

where

N_i = number of location

N = number of sample size

n = total of rounded n_i

Table: 1 Sample Frame and Sample Size

locations	sample frame	calculation	rounded n_i
Galadima	85	$85/193 \times 130 = 57.3$	57
Yankura	52	$52/193 \times 130 = 35$	35
Ibo Road by Market	30	$30/193 \times 130 = 20.2$	20
France road	26	$26.193 \times 130 = 17.5$	18
Total	193		130

Preliminary survey 2025



Resulting in Table 1 showed that, 57 (Galadima), 35 (Yankura), 20 (Ibo Road by Market), and 18 (France Road) respondents. The sampling process involved: (1) stratifying by location, (2) determining the required sample per stratum, and (3) using simple random sampling (ballot box method) to select respondents, ensuring equal selection probability

Method of Data Collection

Primary data were collected using structured questionnaires and interview schedules administered by trained enumerators. This approach ensured comprehensive data on socioeconomic characteristics, ICT adoption, social media use, and constraints, aligning with standard practices in market-based studies (Adikwu *et al.*, 2020).

Tools for Data Analysis

Data were analyzed using descriptive and inferential statistics to address the study's objectives.

Descriptive statistics such as percentage, mean, minimum, and maximum was calculated (Weiss, 2012). Percentage was computed as:

$$\text{Percentage \%} = \frac{X}{n} \times 100 \quad \text{----- (3)}$$

Where

% = percentage

X = individual observation

n = number of observation

Frequency was organized as:

$$\frac{\sum f}{Nr} \quad \text{----- (4)}$$

where

X = is individual observation,

Nr = is total number of observations,

\sum = is frequency summation

Logistic Regression Analysis: This was Applied to (ICT adoption levels). The model, following Giorgio *et al.* (2023),

The logistic regression model, as used by Giorgio *et al.* (2023), can be implicitly expressed as:

$$Y = F(X_1, X_2, X_3, X_4, X_5) \quad \text{-----5)}$$

The equation 3 can further be simplified explicitly as follows

$$Y = \alpha + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + \dots \quad \text{----- (6)}$$

Where:

Y = ICT and social media adoption (0= non adopter, 1 = adopter)

Where:

Y = ICT and social media adoption (0= non adopter, 1 = adopter)

X1 = linklin

X2 = Tiktok

X3 = Facebook

X4 = Twitter_x

X5 = whatapps

RESULTS AND DISCUSSION

Quantitative Socioeconomic Characteristics of the Respondents

The results of socioeconomic factors showed that 70% of the respondents were within the age brackets of 41–50 years, predominantly male (73.3%), married (87.7%), (Adebayo *et al.*, 2020). Majority (63.3%) of the respondents had 6–10 years of experience (63.8%), indicating a stable but aging market, with only 0.8% new entrants (1–5 years), suggesting barriers like capital access or market saturation (Ibrahim *et al.*, 2022). High cooperative membership (86.9%) facilitates resource sharing, but 70.8% rely on personal savings for capital, highlighting limited access to formal credit (Yusuf *et al.*, 2023). Incomes are modest, with 81.1% earning 50,000–100,000 Naira monthly, underscoring economic constraints (Musa & Yusuf, 2021).



Table 2: Distribution of Respondents according to Age, Household Size, Experience and Estimated Income among Fish Sellers in Sabon Gari Market

Variables	Frequency	Percentage	Mean
Age			
31-40	24	18.5	44.8 years
41-50	91	70.0	
51-60	15	11.5	
Household size			
1-5	82		5.8 person
6-10	24	63.1	
11-15	24	18.5	
experience		18.5	
1-5	1		9.8years
6-10	82	.8	
11=15	47	63.8	
esti. monthly income		36.281.1	#84,550
50000-100000	103	18.9	
101000-150000	24		

Source: Field Survey 2025

Qualitative Socioeconomic Characteristics of the Respondents

The Table 3 indicated that, trade is male-dominated (73.3%), with females comprising 26.7%. Cultural and economic barriers, such as limited resource access, may restrict female participation. Adebayo *et al.* (2020) noted a similar male dominance in Nigerian fish trading, citing societal norms as a key factor. Education shapes trading capabilities. Most sellers (70.2%) had secondary education, followed by primary (16.8%) and non-formal (12.2%), with no tertiary-educated sellers. This suggests fish selling attracts moderately educated individuals, possibly due to limited profitability. Oladapo and Adebayo (2023) reported secondary education as common (60–75%) among informal traders, reflecting the informal nature of the trade. Most sellers (87.7%) are married, with only 12.3% single, indicating fish selling supports family livelihoods. The low proportion of single sellers suggests the trade's demanding nature may deter younger individuals. Ibrahim *et al.*, (2022) found 85% of fish traders in Kano State are married, consistent with these findings. A significant majority (86.9%) are cooperative members, benefiting from shared resources and credit, while 13.1% are non-members. Musa and Yusuf (2021) reported high cooperative membership (80–90%) among northern Nigerian fish traders, emphasizing its role in market stability. Most sellers (70.8%) rely on personal savings, followed by family/friends (17.7%) and loans (11.5%). Limited loan usage reflects restricted access to formal credit, aligning with Yusuf *et al.* (2023), who noted 65–75% of Nigerian traders depend on personal savings due to financial system barriers.



Table 3: Distribution of the Respondents according to Gender, Educational Level, Marital Status, Cooperative Membership among Fish Sellers in Sabon Gari Market.

Variables	Frequency	Percentage
Gender		
Male	96	73.3
Female	35	26.7
Educational level		
Non formal	16	
primary	22	12..2
Secondary	92	16.8
Tertiary		70.2
Marital Status		
Married	114	
Single	16	87.7
Cooperative membership		12.3
Member	113	
Non member	17	86.9
Source of capital		13.1
personal saving	92	
loan	15	70.8
family/friends	23	11.5
		17.7

Source: Field Survey, 2025

Use of ICT Tools among the Respondents

ICT adoption is moderate, with 66.9% of sellers using tools like digital scales (36.2%), POS machines (33.1%), and smartphones (29.9%), while computer use is negligible (0.8%), reflecting low digital infrastructure. Daily ICT use (63.8%) indicates integration into business activities, primarily for checking market prices (36.2%) and business promotion (33.1%), with online transactions less common (11.8%) due to limited digital payment systems. Social media is predominantly used for customer communication (69.3%), with WhatsApp leading, while product posting (11.8%) and order-taking (18.9%) are limited, suggesting underutilization for marketing or e-commerce (Adebayo *et al.*, 2021). Most users engage daily (63.8%), and 66.9% believe social media boosts sales, though 33.1% see no impact, possibly due to ineffective use or limited reach.



Table 4: Distribution of the Respondents according to ICTs Tools Use

Variables	Frequency	Percentage
Use Icts for fish selling		
yes	85	66.9
No	42	33.1
How often do you use ICTs tools		
Daily	81	63.8
Occasionally	46	36.2
Which the following ICTs Tools do you use		
Mobile/Smartphone	38	29.9
Computer	1	.8
Pos machine	46	36.2
Digital scale	42	33.1
Purpose of ICTs Use		
comm. with customers	24	18.9
Checking market price	46	36.2
Online transaction	15	11.8
Business promotion/advertising	42	33.1
Do you use social media for your business		
posting pictures of your products	15	11.8
communication with you customers	88	69.3
taking orders	24	18.9
Frequently use social media in your business		
Daily	81	63.8
weekly	46	36.2
Do you believe social media has increased you sale		
Yes	85	66.9
No	42	33.1

Source: Field Survey; 2025

Utilization of Social Media among the Respondents

Logistic regression analysis shows whatsapp significantly enhances business use ($\text{Exp(B)} = 5.276$, $p < 0.01$), Olanrewaju *et al.* (2023) found whatsapp's to professional focus boosts networking when adopted, despite low usage among informal traders. while TikTok ($\text{Exp(B)} = 0.199$, $p < 0.05$) and Twitter/X ($\text{Exp(B)} = 0.262$, $p < 0.05$) reduce it, reflecting their entertainment focus (Musa & Ibrahim, 2022). Linkdlin and Facebook show positive but non-significant effects ($\text{Exp(B)} = 1.245$, 1.659), indicating communication-focused use (Adebayo *et al.*, 2021). The model's modest explanatory power (Cox & Snell $R^2 = 0.169$, Nagelkerke $R^2 = 0.230$) suggests unmeasured factors like infrastructure influence adoption (Oladapo & Bello, 2024). The Hosmer and Lemeshow Test confirms good model fit, with close alignment of observed and expected frequencies.

Table 5: Factors Influencing Utilization of Social Media among Fish Sellers in Sabon Gari Market

Variables	95.0% C.I. for EXP(B)							
	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
utilizesocial_media_Linkdlin	.219	.510	.185	1	.667	1.245	.458	3.384
utilize_social_media_facebook	.506	.583	.753	1	.385	1.659	.529	5.199
utilize_social_media_tiktalk	-1.617	.686	5.548	1	.019	.199	.052	.762
utilize_social_media_twitter_x	-1.339	.550	5.933	1	.015	.262	.089	.770
utilize_social_media_whatapps	1.663	.508	10.708	1	.001	5.276	1.948	14.288
Constant	-.341	1.361	.063	1	.802	.711		

Source: Field survey :2025



Challenges to the Adoption of ICT Tools

Key barriers to adoption include inadequate awareness (36.2%), digital skills (33.1%), high device costs (18.9%), and time constraints (11.2%), aligning with the moderate educational profile and digital divide (Yusuf *et al.*, 2023). These findings highlight the need for targeted interventions to bridge gaps in skills, access, and infrastructure, particularly for female sellers (26.7%) who face cultural and economic barriers (Adeyemi *et al.*, 2025).

Table 6: Challenges Faced by Fish Sellers in Sabon Gari Market

Challenges	Frequency	Percentage
inadequate of digital skills	42	33.1
High cost of devices	24	18.9
inadequate awareness	46	36.2
Time Consuming	15	11.2

Source: Field Survey, 2025

CONCLUSION AND RECOMMENDATIONS

In conclusion, the study found that fish sellers in Sabon Gari Market operate in a stable but aging sector, earning modest income and relying heavily on personal saving and cooperative network due to limited access to formal credit. ICT adoption is moderate, with sellers mainly using smartphones, POS machine and digital scales while WhatsApp significantly enhances business activities compared to other platforms. Key challenges including low digital skills, inadequate awareness and high device costs –continues to hinder full ICT integration and market modernization

Based on the findings in the study area, the following recommendations are proffered 1. Government should engaged youth-focused training to address low new entrant numbers, digital literacy programs emphasizing LinkedIn and marketing-focused WhatsApp/Facebook use, subsidies for affordable devices, cooperative-led resource sharing, and gender-inclusive initiatives to empower female traders. 2. Stakeholders should leverage cooperatives for credit and digital tool access. 3. Stakeholders should Support female sellers with resources and training to address disparities

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