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COLLEGE OF AGRICULTURAL AND ENVIRONMENTAL SCIENCES
SCHOOL OF AGRICULTURAL SCIENCES

AN ASSESSMENT OF CONSUMER PREFERENCE FOR COMMON FISH SPECIES IN PAKWACH DISTRICT, UGANDA

BY

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A DISSERTATION SUBMITTED TO THE DEPARTMENT OF AGRIBUSINESS AND NATURAL RESOURCE ECONOMICS, COLLEGE OF AGRICULTURAL AND ENVIRONMENTAL SCIENCES IN PARTIAL FULFILMENT OF THE REQUIREMENT OF THE AWARD OF A BACHELOR'S DEGREE IN AGRIBUSINESS MANAGEMENT OF MAKERERE UNIVERSITY

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DECLARATION

I, RWOTHONGEYO PILATE declare that this study titled *An assessing consumer preference for common fish species in pakwach district in, Uganda* is original and has not been published or submitted for any other degree award to any other university before.

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APPROVAL

This research dissertation has been submitted for examination with the approval of the supervisor.

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LIST OF ABBREVIATIONS

FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
NDP	National Development Plan
NEMA	National Environment Management Authority
NGO	Non-Governmental Organization
OCR	Output Contribution Ratio
SDG	Sustainable Development Goals
TPB	Theory of Planned Behaviour
UBOS	Uganda Bureau of Statistics
UNEP	United Nations Environment Programme
USD	United States Dollar
WFP	World Food Programme
WHO	World Health Organization

ABSTRACT

Fish is a vital source of protein and essential nutrients globally, playing a crucial role in food security and nutrition, particularly in developing regions. Despite its importance, consumer preferences and factors influencing fish consumption remain poorly understood. This study aimed to investigate consumer preferences for common fish species, analyze factors affecting fish consumption decisions, and identify challenges faced in accessing fish in Pakwach District. A cross-sectional survey design was employed, with data collected through face-to-face interview from 107 respondents. The study utilized descriptive statistics and logistic regression, to analyze data using STATA version 15. The findings revealed that Tilapia was the most commonly consumed and preferred fish species, followed by Nile Perch and Catfish. Taste, price, availability, and nutritional value were the main attributes influencing consumer choice. Logistic regression results indicated that the education level of the household head ($p = 0.093$) and distance to the nearest market ($p = 0.074$) were significant predictors of fish consumption frequency. Households with more educated heads were more likely to meet the recommended consumption of at least twice per week, whereas households located further from markets consumed fish less frequently due to accessibility challenges. High fish prices (62%) emerged as the main challenge limiting access, with poor storage facilities, limited supply, and fish quality also contributing. To cope, most respondents substituted fish with other protein sources, reduced consumption, or traveled further to access fish.in conclusion, the study highlights the need to prioritize sustainable production of preferred fish species and enhance nutritional education, especially among larger and less-educated households. Interventions to reduce fish prices, improve storage infrastructure, and ensure steady supply are critical to improving fish accessibility and consumption.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Understanding consumer preferences is key to increasing production, adjusting to market demands, and improving dietary diversity (Galanakis, 2024; Saidi et al., 2022). Fish is vital source of proteins, essential fatty acids, vitamins and minerals in diets the world over (Naeem & Selamoglu, 2023; Thorsdottir et al., 2012). Over the past several years, increasing consumer preferences have shaped fisheries management and trade patterns (Dyudyayeva, 2023), preferences vary depending on established cultural practices, income levels, availability, and nutritional awareness. There has been an increase in fish consumption worldwide by per capita fish intake, which has risen from 10 kg in the 1960s to 20.5 kg in 2022 (Asiedu et al., 2023). However, such figures do not reflect substantial regional differences and the concern of certain particularities- like consumer preference that impacts local economies and food security (Citaristi, 2022). Fish constitute a vital source of food around the world providing as much as 17% of intake of global animal protein (Mekouar, 2018). The fisheries sector employs more than 60 million people globally, whereas small-scale fishers typically make up almost 90% of that number (Coates, 2023).

In Africa, it is estimated that about 22% of protein intake comes from fish in coastal and riverine communities, making it one of the most important nutritional as well as livelihood resources (Fisheries & others, 2022). The continent produces about 7% of the world's fish; however, the average fish consumption per person remains low at 10 kg, hence not very much available (Walakira et al., 2023). Sub-Saharan Africa, which relies intensely on freshwater fisheries and cultural preservation of fish, manifests distinct fish consumption patterns (FAO, 2022; Africa, 2023). In many countries of the region, like those bordering the Great Lakes and large rivers, fish account for more than half of the total protein intake. Population growth, coupled with environmental impacts lead to increasing considerations of better understanding consumer choice to balance demand and supply (Tirumala & Tiwari, 2021).

The fisheries sector contributes much to food security and economic activities in the East African region. Uganda is among the leading countries in producing fish in the region, where Lake Victoria

alone contributes over 50% of the national fish production (Tibenda et al., 2017). The sector provides employment opportunities for millions, and supplies sustenance as it can be an important source of nutrition to local communities. However, changing consumer preferences along with the environmental threats of overfishing and pollution are changing the dynamics of fish production and trade (Kwiyocwiny, 2023). The country's fishing industry contributes 3% to the national GDP with the main targeted species for consumption being Nile perch, tilapia, and mukene(silver fish) (Tukashaba, 2024). Per capita fish consumption within the country is estimated at 12.5 kg per person every year, which is below the world average of 20.7kg but very important in fighting malnutrition especially in rural places (Grace, 2022). This study examines consumer preferences for common fish species in Pakwach findings to be used for policy-making and fisheries management in solving the nutritional and economic needs.

1.2 PROBLEM STATEMENT

The fisheries sector in Uganda plays a significant role in the economy, contributing about 2.5% to the national GDP and providing livelihood to over 5.3 million people engaged in fishing, processing, and trading along the value chain (UBOS, 2022). Fish is also an important source of affordable animal protein, accounting for nearly 50% of the total animal protein intake in the country (FAO, 2021). This aligns with Uganda's National Development Plan III (NDP III), which emphasizes agro-industrialization and improved nutrition as key strategies for social transformation. Despite this importance, fish consumption levels remain highly variable across communities due to socioeconomic, cultural, and policy-related factors. Recent reports indicate that while Uganda produces over 600,000 metric tons of fish annually, per capita consumption has stagnated around 10 kg per person per year, far below the WHO recommended 25 kg per person per year (MAAIF, 2022). This points to challenges in availability, affordability, and dietary choices that limit optimal utilization of fish for food and nutrition security.

However, the current state of affairs raises several concerns. On the policy side, weak enforcement of fisheries regulations has contributed to illegal fishing, stock depletion, and rising market prices, undermining household access to fish (Kiggundu et al., 2021). Socioeconomic inequalities, such as income disparities and education levels, also influence household consumption patterns, while cultural and religious beliefs further restrict utilization in some communities (Ssebisubi, 2020). In Pakwach district, despite its proximity to major water bodies like the River Nile and Lake Albert,

households still experience inconsistent fish consumption, suggesting that availability alone does not guarantee access or preference. This study, therefore, seeks to assess consumer preference for common fish species in pakwach district, aiming to generate insights that can inform interventions to enhance fish utilization, strengthen household nutrition, and align with national priorities of achieving food and nutrition security.

1.3 Objectives of the study

1.3.1 Major objective

To investigate consumer preferences for common fish species in Pakwach District**.**

1.3.2 Specific objective

i. To determine the most common type of fish consumed and the preferred attributes by the consumers in Pakwach district.
ii. To examine the factors influencing the frequency of fish consumption among households in Pakwach district
iii. To determine the challenges faced by consumers in accessing fish in Pakwach district.

1.5 Research question**s**

i. What are the most commonly consumed type of fish among the household in pakwach district?
ii. How does house hold demographic factors influences frequency of fish consumption in pakwach district?
iii. What are the challenges faced by the consumer in accessing fish in pakwach district?

1.6 Significance of the study

This study is significant as it provides valuable insights into consumer preferences for fish species, which can inform fisheries management, local trade practices, and policy-making. Understanding the factors influencing fish consumption patterns helps reduce economic losses and wastage faced by local fishermen and traders. The findings contribute to enhancing food security by identifying the most preferred fish species and addressing the challenges consumers face in accessing fish. Ultimately, this study assists in developing strategies to promote sustainable fish production and consumption, benefiting both local communities and the broader fisheries sector in Uganda.

CHAPTER TWO

LITERATURE REVIEW:

2.1 The fish industry in Uganda

The fish industry in Uganda plays a significant role in the country's socio-economic development. Uganda is endowed with numerous freshwater bodies, including Lake Victoria, Lake Albert, Lake Kyoga, and the River Nile, which support a vibrant fishing sector. According to FAO (2020), the fisheries sector employs over 1.2 million people directly and indirectly, contributing significantly to livelihoods and food security. The sector is not only a source of employment but also plays a critical role in the nutrition of Ugandans, providing affordable protein sources for both urban and rural populations (Musaazi et al., 2021; MAAIF, 2020).

The fishery sector contributes significantly to Uganda's GDP and export earnings. Uganda exports a substantial amount of fish, particularly Nile perch, to international markets such as the European Union, earning foreign exchange and boosting national income (NARO, 2020). According to UBOS (2022), the fisheries subsector contributes approximately 2.8% to Uganda's GDP and over 12% to the agricultural GDP. The government has recognized the importance of this sector and continues to implement policy frameworks to ensure its sustainability and growth (Akello et al., 2019; FAO, 2021).

Despite its importance, the Ugandan fish industry faces numerous challenges including overfishing, use of illegal fishing gear, post-harvest losses, and poor infrastructure. According to Nunan et al. (2018), illegal, unreported, and unregulated (IUU) fishing practices significantly reduce fish stocks and threaten the sustainability of the industry. These challenges have necessitated increased government intervention, such as fishery enforcement operations and the promotion of aquaculture to supplement declining wild stocks (Musinguzi et al., 2019; Kolding et al., 2020).

Aquaculture is emerging as a viable solution to declining fish stocks and increasing demand. Fish farming is increasingly being adopted, especially in central and western Uganda, due to its potential to provide a consistent supply of fish and improve household incomes (Ogello et al., 2014). The National Fisheries Policy encourages investment in aquaculture to reduce pressure on natural water bodies. With improved technologies and government support, aquaculture is

expected to play a critical role in Uganda's future fish production (FAO, 2021; Musuka et al., 2022; Atukunda et al., 2023).

2.2 Common fish species in Uganda

Uganda is home to a variety of freshwater fish species, with the most common ones being Nile perch (Lates niloticus), Tilapia (Oreochromis niloticus), and catfish (Clarias gariepinus). Nile perch, introduced into Lake Victoria in the 1950s, has become a key export species due to its size and taste, playing a major role in the commercial fishery (Balirwa et al., 2003; Njiru et al., 2005; Kayiso et al., 2009). Tilapia, on the other hand, is widely consumed locally and preferred for its affordability and palatability (Mwanja et al., 2016; Ogutu-Ohwayo et al., 2017; MAAIF, 2020).

Catfish is another important species in Uganda's inland fisheries. Known for its high protein content and adaptability, catfish is both farmed and caught in the wild, making it a reliable source of income and food for local communities (Rutaisire et al., 2009; Nyeko et al., 2020; Akoll & Ogutu-Ohwayo, 2021). While Nile perch dominates export markets, catfish and tilapia are preferred in local markets due to their availability and cultural relevance in traditional dishes (Musinguzi et al., 2020; Turyahebwa et al., 2021; FAO, 2021).

Regional preferences for fish species vary across Uganda. For instance, residents around Lake Albert tend to prefer smoked or dried fish, especially Alestes and Bagrus species, due to preservation needs in areas with limited access to refrigeration (Musinguzi et al., 2019; Kasozi et al., 2021; Nabwire et al., 2023). In contrast, urban centers such as Kampala and Gulu show a growing demand for fresh and frozen tilapia and catfish, driven by modern retail outlets and increasing urbanization (Opio et al., 2018; UBOS, 2022; NARO, 2022).

In recent years, there has been a gradual shift in fish consumption patterns in Uganda, driven by availability, price, and consumer awareness. The growth of aquaculture has increased access to farmed species like tilapia and catfish in inland districts, including Pakwach (Mwanja et al., 2021; FAO, 2020; Musuka et al., 2022). As aquaculture grows, consumer preferences are expected to evolve based on taste, texture, ease of preparation, and price – important considerations for policy and investment in fish farming (Rutaisire et al., 2019; MAAIF, 2021; Atukunda et al., 2023).

2.3 Theoretical review

2.3.1 Consumer Preference Theory

Consumer Preference Theory explains how individuals make choices based on their preferences, budget constraints, and available options (Lancaster, 1966). The theory suggests that consumers evaluate products based on attributes such as taste, price, quality, and availability before making a purchase decision (Roy, 2022). In the context of fish consumption, consumer preferences are influenced by factors such as species availability, freshness, cultural background, and nutritional value (Saidi, Sacchi, et al., 2022; Ayuya et al., 2021; Krešić et al., 2022). Previous studies indicate that affordability and accessibility play a key role in determining fish consumption patterns in both rural and urban settings (Issifu et al., 2022; De Bruyn et al., 2021).

Applying this theory to this study, consumer choices in Pakwach District are likely influenced by economic factors, taste preferences, and social norms (Mutyaba et al., 2024). Households may prefer certain fish species over others based on their affordability, preparation ease, or perceived health benefits (Ayuya et al., 2021). Additionally, differences in household income levels and fish market dynamics shape purchasing behavior, leading to variations in demand across different fish species (Byabasaija et al., 2024).

2.3.2 Theory of Planned Behavior (TPB)

The Theory of Planned Behavior (TPB) suggests that human behavior is guided by three main components: attitude toward the behavior, subjective norms, and perceived behavioral control (Ajzen, 1991). In the context of fish consumption, the theory explains how consumer attitudes toward fish, societal influences, and their ability to access fish affect their purchasing decisions (Benvindo et al., 2024). Studies have shown that consumers' attitudes toward fish consumption are shaped by health awareness, cultural beliefs, and environmental concerns (Sacchettini et al., 2021; Petereit et al., 2022; Budhathoki et al., 2022). Social influences such as family traditions, peer recommendations, and media exposure contribute to shaping consumer behavior (Mishra & Maity, 2021).

In relation to this study, TPB helps explain why some consumers in Pakwach may prefer specific fish species while others may avoid them due to cultural or personal beliefs. For example, if consumers perceive certain fish species as more nutritious or prestigious, they are more likely to consume them, even if they are relatively expensive (Mitra et al., 2021). Constraints such as limited

access to markets or inadequate preservation methods may hinder consumption despite positive attitudes toward fish (Moreau & Garaway, 2021).

2.4.1 Most common type of fish consumed and the preferred attributes by the consumers

Fish consumption patterns vary globally, influenced by factors such as availability, affordability, and cultural preferences (Ayuya et al., 2021; Budhathoki et al., 2022). In many African countries, including Uganda, Nile perch (Lates niloticus), tilapia (Oreochromis niloticus), and catfish (Clarias gariepinus) are the most commonly consumed species due to their high nutritional value and market availability (Yongo et al., 2021). Studies indicate that consumer preferences are largely driven by attributes such as taste, texture, freshness, and nutritional benefits (Baingana, 2024; De Araújo et al., 2022; Petrescu et al., 2019). Freshness, in particular, is a crucial determinant of fish selection, as consumers associate it with better taste and safety (Menozzi et al., 2020).

Several studies highlight that consumer choices also depend on the ease of preparation and cooking (Fernqvist et al., 2024; Imtiyaz et al., 2023; Chen & Antonelli, 2020). For instance, tilapia is preferred due to its mild flavor and adaptability to various cooking methods, including frying, grilling, and boiling (Iswarya et al., 2023). In contrast, catfish is favored for its high protein content and affordability, making it a staple in many low-income households (Samuel, 2021). Fish with fewer bones, such as Nile perch, tend to be more popular among households with children (Svanberg & Locker, 2020). These preferences indicate that both sensory and practical attributes significantly influence fish consumption in different communities.

2.4.2 Factors influencing the frequency of fish consumption among households in Pakwach district

Consumer decisions regarding fish consumption are influenced by a range of economic, social, and environmental factors (FAO, 2022; Ayuya et al., 2021). Price remains a major determinant, as lower-income households often opt for more affordable fish species, while wealthier consumers may choose premium fish for their perceived quality and status (Neori & Agami, 2024; Novita & Rowena, 2019). In Uganda, price volatility due to seasonal availability and fishing regulations affects consumer preferences, as higher costs limit access to certain species, particularly Nile perch and tilapia (Byaruhanga, 2023). Household income levels influence purchasing decisions, with low-income families relying on small, dried fish such as Mukene (Rastrineobola argentea) due to its affordability and long shelf life (Wessels et al., 2023).

Cultural and dietary habits also shape fish consumption choices (Pupavac et al., 2022; Rahman & Islam, 2020). Some communities prefer specific fish species based on traditional recipes and culinary practices. For instance, tilapia is widely consumed due to its mild taste and adaptability to various cooking methods, while catfish is favored for its higher fat content, which enhances flavor when smoked (Moyo & Rapatsa, 2021; Alam et al., 2017). Religious beliefs further influence fish consumption, as certain faiths encourage or discourage eating particular species. For example, some Christian and Muslim communities avoid fish without scales, limiting their choices (Cohen, 2020); Lowe et al., 2019)

Availability and accessibility also impact consumer decisions (Lindgren, 2024). Fish species that are abundant in local markets are more likely to be consumed frequently. However, climate change and overfishing have reduced fish stocks, leading to scarcity and higher prices (Maiyza, 2023). Inadequate infrastructure, such as poor transportation and storage facilities, affects the distribution of fresh fish, forcing consumers to rely on frozen or dried alternatives (Siddiqui et al., 2024).

2.4.3 Challenges faced by consumers in accessing fish

Several structural and economic challenges hinder consumer access to fish in many developing regions, including Pakwach District. One major constraint is fluctuating fish supply due to seasonal variations and declining fish stocks caused by overfishing and climate change (Silas et al., 2020). During off-seasons, fish becomes scarce, leading to increased prices that disproportionately affect low-income households (Neori & Agami, 2024). Government fishing regulations, such as bans on certain fishing practices, contribute to inconsistent fish supply, limiting consumer access (Orofino et al., 2023).

Poor infrastructure and market access further complicate fish availability (Moreau & Garaway, 2021). Many rural areas lack proper transportation networks, leading to delays in fish distribution and increased spoilage rates (Bedane et al., 2022). Inadequate cold storage facilities exacerbate the problem, forcing consumers to rely on dried or smoked fish, which may not always meet their preferences (Akintola et al., 2021). Limited market facilities and high transportation costs restrict access to fresh fish, making it difficult for residents in remote areas to obtain quality seafood (Henriksson et al., 2021).

Affordability remains another significant challenge (Love et al., 2022). Rising operational costs, including fishing gear, fuel, and licensing fees, lead to increased fish prices (Owusu, 2025).

Consumers in Pakwach District, particularly those from lower socio-economic backgrounds, struggle to afford high-quality fish species like Nile perch and tilapia, often opting for cheaper alternatives such as Mukene (Rastrineobola argentea). Addressing these challenges requires policy interventions to improve fish supply chains, market access, and pricing regulations to enhance fish consumption and food security in the region.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter outlines the research methodology used. It describes the research design, study area, population, sampling design, data collection methods, data sources, data processing and analysis and ethical considerations.

3.2 Research Design

This study adopted a descriptive cross-sectional survey design, utilizing a structured questionnaire to collect and analyze data on consumer preferences for common fish species in Pakwach District. This design was well-suited to capturing a comprehensive understanding of behaviors, preferences, and influencing factors at a specific point in time.

A cross-sectional design involves the collection of data from a sample population at a single point in time, rather than over a prolonged period (Setia, 2016). It is widely used in behavioral and social sciences to describe characteristics, attitudes, or opinions of a target population. In this study, the cross-sectional survey enables the researcher to assess the variety of fish species consumed, reasons for preferences, consumption frequency, and socio-economic or cultural factors influencing those choices.

This design is particularly appropriate because the research aims to explore current consumer behaviors without manipulating any variables. It allows for the simultaneous collection of quantitative data (e.g., frequency of fish consumption, ranking of preferences) and qualitative data (e.g., reasons for preferences, traditional knowledge), thereby producing both statistical and

contextual insights (Creswell & Plano Clark, 2018). The descriptive nature of the design ensures that the study captures rich details regarding the diversity of consumer experiences and opinions.

The mixed-methods approach within this design involved two main components:

Quantitative data was collected using structured questionnaires with closed-ended questions, enabling statistical analysis of trends and associations.

3.3 Study Area

The study was conducted in Pakwach District. Pakwach district located in northwestern Uganda along Lake Albert and the Albert Nile. Pakwach District is known for its vibrant fisheries sector, which supports the livelihoods of many local residents. The proximity to major water bodies makes it a prime location for studying fish consumption patterns and preferences. The district's rural and peri-urban setup provides a mix of consumer profiles, offering insights into both local market dynamics and challenges related to fish accessibility.

3.4 Study Population

The study population consisted of fish consumers who regularly consume or purchase fish. The target groups included household heads, who are the key decision-makers in fish consumption, and other consumers representing various socioeconomic, cultural, and demographic groups.

3.5 Sampling Design

An introductory letter was obtained from the university upon approval of the research proposal. Five sub counties and twenty villages from each subcounty within the district were purposively selected based on the diversity of species availability. The university’s introductory letter was presented to local leaders in the selected villages to get permission for the interview. A list of households was obtained from these local leaders, and the households to be interviewed were randomly selected by the interviewer, without consideration of political, religious, social, or cultural affiliations. From each selected household, the household head, who was the key decision-maker, was interviewed with their consent.

3.6. Sample size determination

A stratified random sampling method was used to ensure proportional representation from all faculties. The strata were based on faculties, and within each stratum, random sampling was

employed to select participants. The sample size was calculated using Cochran's formula for prevalence studies:

$$n = \frac{Z^2 * p * (1 - p)}{e^2}$$

Where:

- Z = Z-score for 95% confidence (1.96)
- p =proportion(p) 0.5 measures the maximum variability.
- e = margin of error (10%)

n = (1.96) ^2×0.5× (1-0.5)/ (0.1) ^2

n = 98

The calculated sample size was adjusted for non-response rate, resulting in approximately 107 participants.

3.7 Data Collection Methods

3.7.1 Instruments

Data for this study were collected using structured questionnaires (Appendix 1). The questionnaire was designed to gather quantitative data and included both closed-ended questions for statistical analysis and a few open-ended questions to allow for responses that are more detailed.

An introductory university letter that allowed collection of data from the area was secured first and other relevant permissions from local leaders in the area sought. Pre-testing of the questionnaire and interview guides was conducted in a neighboring bulisa district to refine the tools. Trained research assistants administered questionnaires and conduct interviews in local languages where necessary. The data collection took place over a period of four weeks, allowing enough time to reach the sample size and ensure thorough data collection. The completed questionnaires were reviewed for completeness, and the interviews were recorded with consent, ensuring that all data were accurately captured for analysis.

3.8 Data Collection Sources

Primary Data: Direct responses from the house hold head who is key decision maker in the household.

Secondary Data: Reports, studies, and statistics from fisheries departments, market records, and government agencies.

3.9 Data Analysis

Objective 1: To determine the most common type of fish consumed and the preferred attributes by consumers.

Descriptive statistics, including frequencies, percentages, and means, were used to summarize the distribution of fish species consumed and their preferred attributes. The Mode (Mo) was applied to identify the most frequently consumed fish species, represented as:

$Mo =$ Category with highest frequency

Objective 2: A logistic Regression model was employed, since the dependent variable—frequency of fish consumption—was categorical. For analysis, frequency of consumption was categorized as:

0 = Two times and below per month

1 = Three times and above per month

While the researcher is aware that the recommended fish consumption frequency per week is 2 to 3 times, this categorization was not possible for this study area as most of the households were consuming fish much less frequently. Therefore, the categorization used in this study is subjective basing on the prevailing frequencies in the area.

The independent variables included socio-economic factors (income, education, household size), cultural preferences, availability, and price.

The general form of the logistic regression model is specified as:

$$P(X)=e^{\wedge}(\beta 0+\beta 1x1+\beta 2x2+\ldots+\beta kxk)/1+e^{\wedge}(\beta 0+\beta 1x1+\beta 2x2+\ldots+\beta kxk)$$

Where:

- $p(X)$ is the predicted probability of the dependent variable .
- $\beta 0$ is Intercept.
- $\boldsymbol{\beta}1$, $\boldsymbol{\beta}2$, $\boldsymbol{\beta}3$ are the regression coefficients for the predictor variable
- $\times 1, \times 2, \times n$
- **e** is the natural logarithms

Objective 3: To determine the challenges faced by consumers in accessing fish.

Descriptive statistics, including frequencies, percentages, and mean scores, were used to analyze the challenges consumers face in accessing fish. The challenges included factors such as price fluctuations, transportation difficulties, seasonality, and market availability. Likert scale responses were analyzed to determine the severity of these challenges, with mean scores used to rank them in order of significance.

3.10 Ethical Considerations

This study adhered to ethical guidelines to protect the rights and welfare of all participants. Informed consent was obtained from each respondent who were informed of the purpose, procedures, and benefits from participating in the study. Participation was voluntary, and respondents had the right to withdraw at any time. Confidentiality was ensured by anonymizing responses and securely storing data. Approval was sought from a relevant ethics review board before data collection begins.

CHAPTER FOUR

PRESENTATION AND INTERPRETATION OF THE RESULTS

4.0 Introduction

This chapter presents the results of the study based on the data collected through in-person interview. The analysis is organized according to the study objectives, beginning with the demographic characteristics of respondents, followed by detailed analysis and both descriptive and inferential statistical methods are used to interpret the results.

4.1 Response Rate

Questionnaires administered	110
Completed & returned	107
Response rate	97.3%

Out of the 110 questionnaires that were administered through in-person data collection, a total of 107 were successfully completed and returned, resulting in a response rate of 97.3%. This strong response rate indicates a high level of participant engagement and cooperation, which enhances the reliability and representativeness of the findings.

4.2 Demographic Characteristics of Respondents

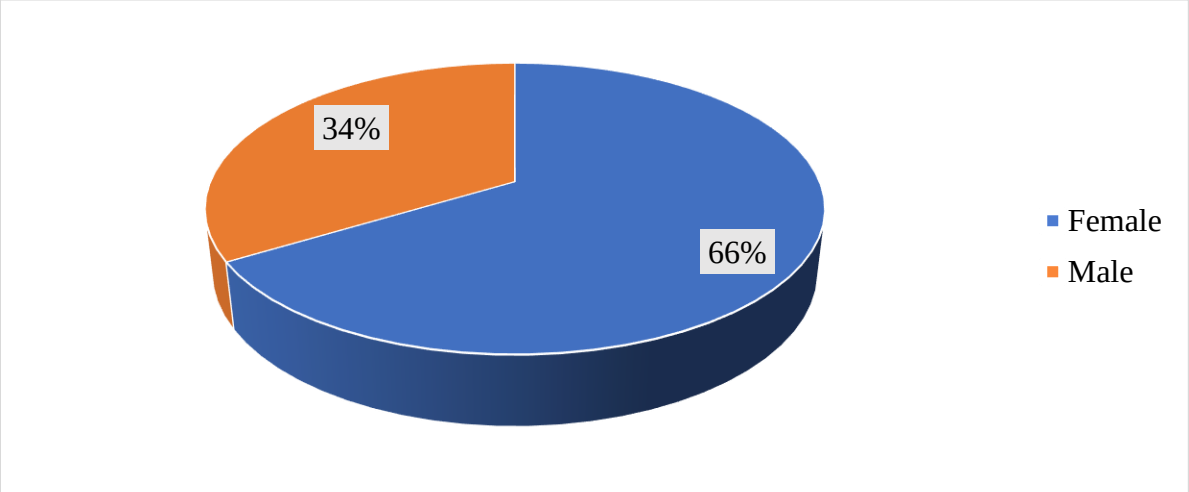
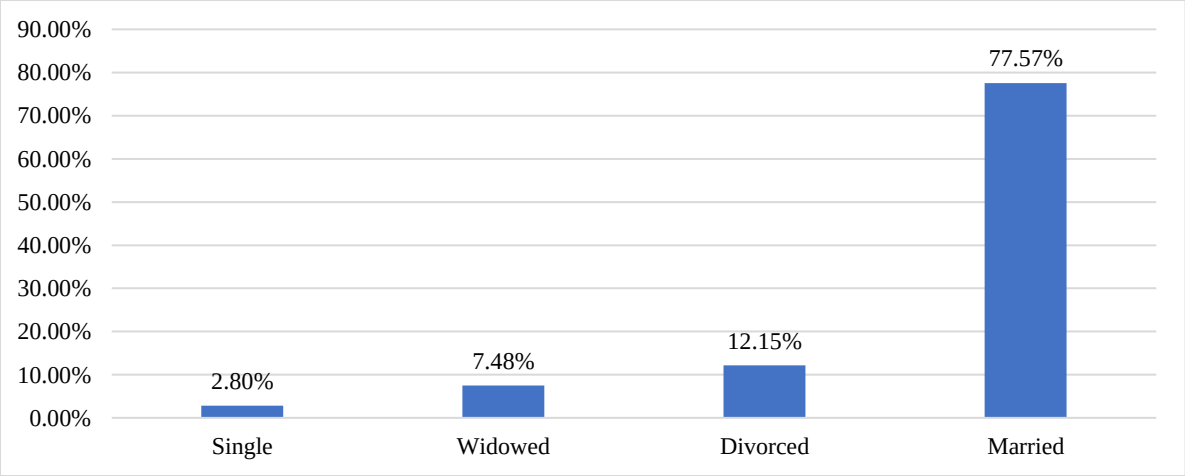


Figure 1: Gender distribution of respondents

The gender distribution of respondents shows that 66% were female while 34% were male. Women constituted the majority of participants in this study and reflects the prominent role women play in household food purchasing and consumption decisions in many Ugandan communities, particularly in rural and peri-urban settings like Pakwach District.

Figure 2: Marital status of respondents



Among the surveyed population, 77.57%, were married, followed by 12.15% who were divorced, 7.48% widowed, and only 2.8% single. This predominance of married individuals suggests that

most of the fish consumption decisions are made within family or household contexts, where shared responsibilities and budgeting are common.

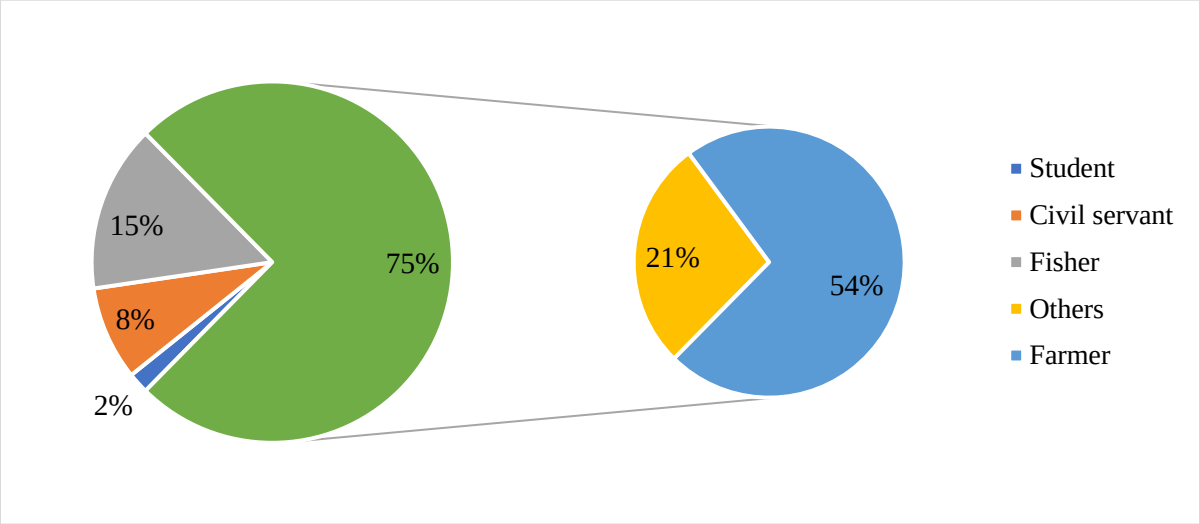
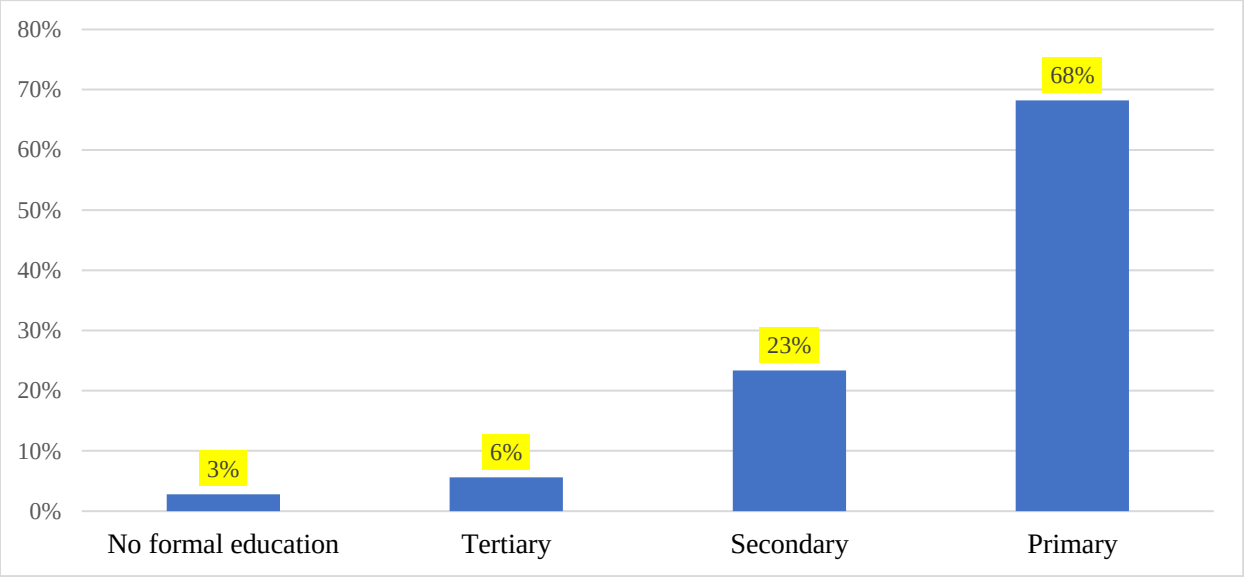


Figure 3: Occupation of surveyed participants

The occupation data shows that 54% of the respondents were farmers, followed by 21% in the "others" category (informal or casual work), 15% who were fishers, 8% civil servants, and only 2% students. This distribution highlights the dominant role of agriculture and related rural livelihoods in Pakwach District. The high percentage of farmers suggests a community highly dependent on natural resources for food and income, which may influence their fish consumption behaviour based on seasonality, affordability, and access. In addition, the presence of fishers among respondents provides direct insights from those involved in the supply chain, while the civil servants and students, though fewer, offer perspectives from formal employment and youth respectively—both of which are important for developing inclusive fisheries policies

Figure 4: Education level of household head



The majority, 68%, had attained only primary education, followed by 23% with secondary education, 6% with tertiary education, and 3% with no formal education. This distribution reflects a generally low level of formal education among household heads in Pakwach District, which can have implications for their awareness and understanding of nutrition, food safety, and informed fish consumption choices. Limited education may also affect access to information about dietary diversity and constrain economic opportunities, thereby influencing both preference and affordability of fish. Therefore, fish promotion strategies in the area should be accompanied by simple, accessible information and community-based education efforts tailored to low-literacy populations

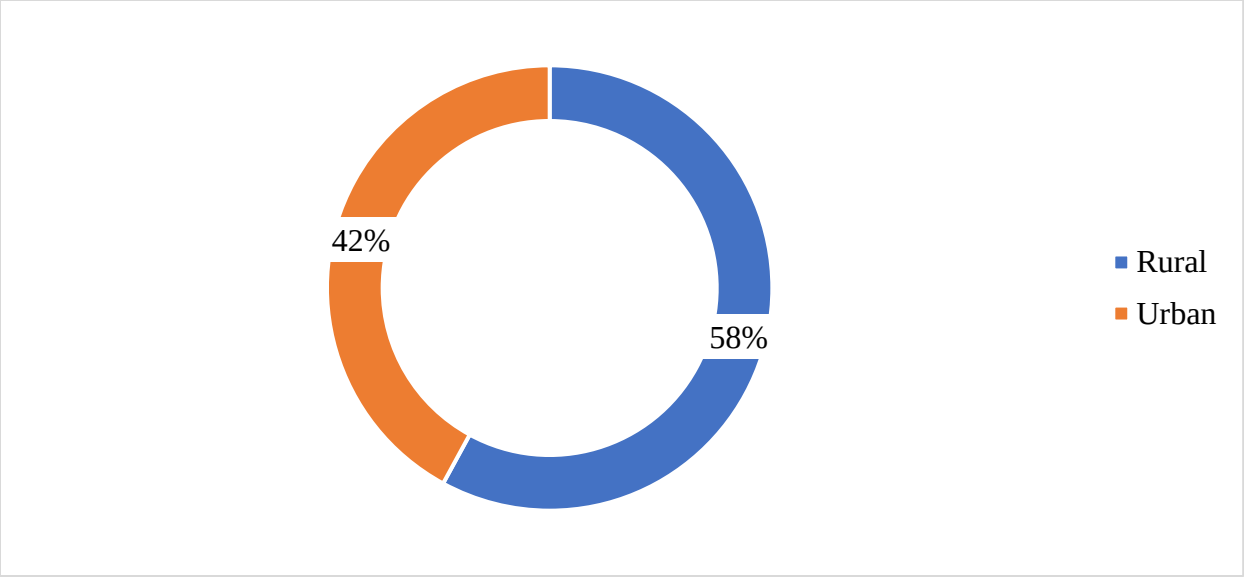


Figure 5: Distribution by location of residence

The distribution of respondents by residence shows that 58% live in rural areas while 42% reside in urban areas, indicating that the majority of the surveyed population is rural-based. This rural dominance is consistent with the demographic profile of Pakwach District, where many households rely on subsistence farming and fishing for their livelihoods.

Table 1: Demographic characteristic (continuous variables)

Demographic characteristic	Mean (n)	Standard deviation
Average of Age (years)	37 years	15.70
Average of Monthly Income (Uganda shillings)	89,701	126101.91
Average of Household Size	5	3.22
Average of Distance to the nearest food market	3.2 km	4.0

The results indicate that the average age of respondents is 37 years (SD = 15.70), suggesting a fairly diverse age distribution with both young and older individuals represented. The mean monthly income is UGX 89,701 (SD = 126,101.91), reflecting income disparity among households, which may influence purchasing power and access to food. The average household size is 5 members (SD = 3.22), implying that many households may have significant consumption needs, potentially affecting food security and expenditure priorities. The average distance to the

nearest food market is 3.2 km (SD = 4.0), showing that while some residents have markets nearby, others may face considerable travel distances, which could limit market access and frequency of food purchases. These variations highlight socioeconomic and geographic inequalities that can shape food access and consumption patterns.

Objective one result

4.3 The most common type of fish consumed and the preferred attributes by consumers in pakwach district

4.3.1. The most common type of fish consumed

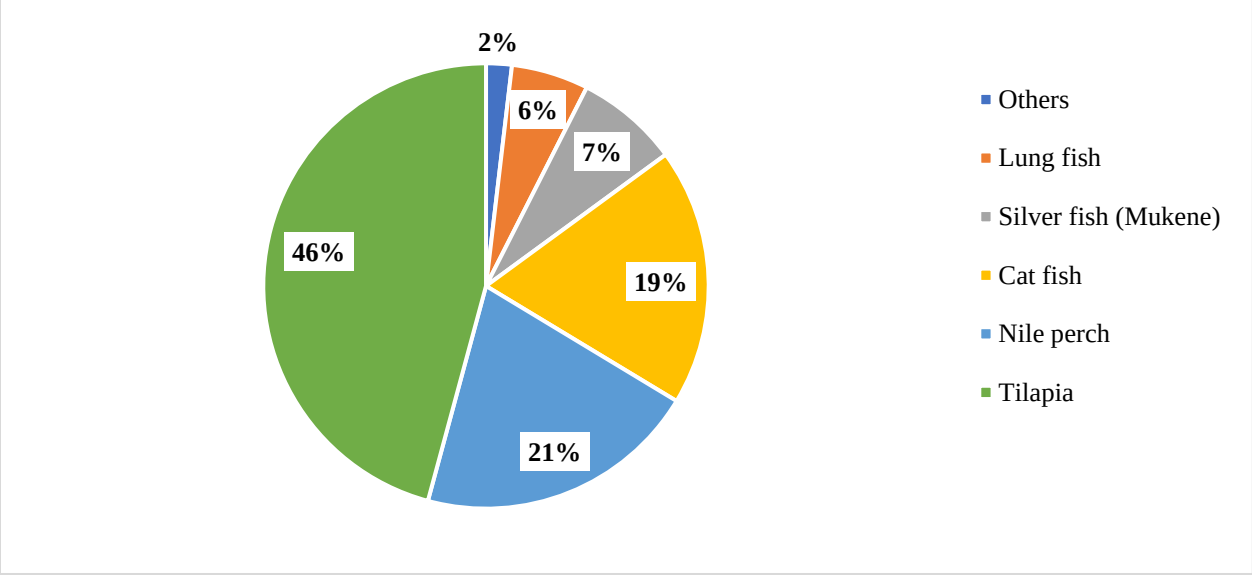
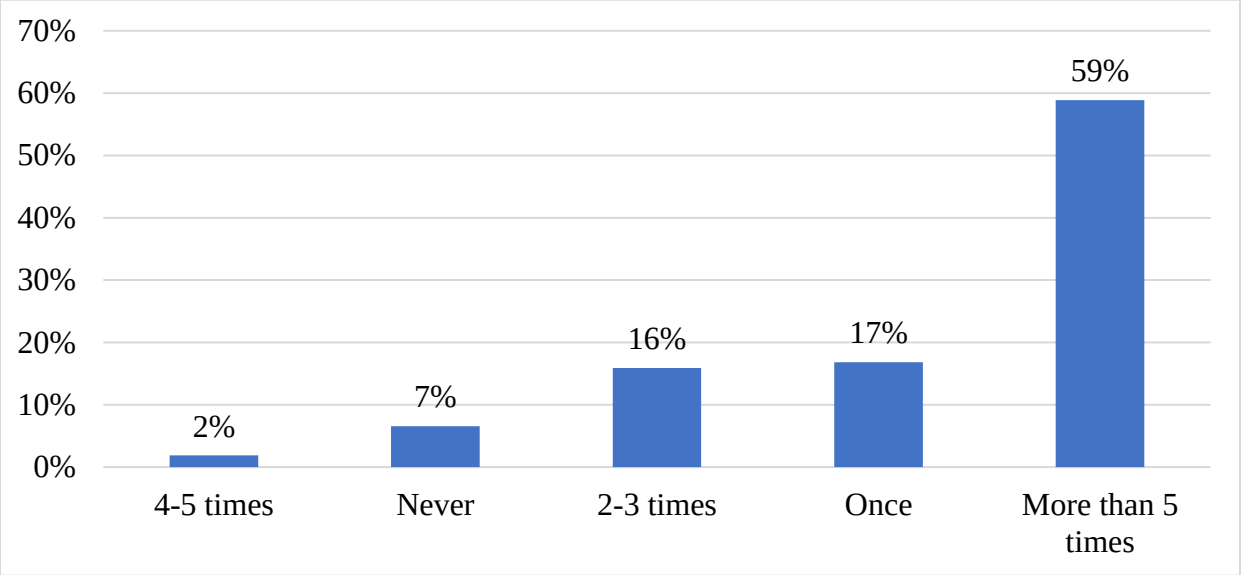


Figure 6: The most common type of fish consumed

Tilapia is the most commonly consumed fish type in Pakwach District, accounting for 46% of responses. This is followed by Nile perch at 21%, Cat fish at 19%, Silver fish (Mukene) at 7%, Lung fish at 6%, and others at 2%. The dominance of Tilapia suggests that it may be widely available, affordable, and culturally accepted, making it a staple among consumers. Nile perch and catfish also have significant consumption, likely due to their local availability from nearby Lake Albert and the River Nile. The relatively low consumption of Mukene and Lung fish may be attributed to taste preferences, preparation challenges, or limited awareness of their nutritional

benefits. These insights are essential for targeting specific fish species in consumer education and marketing strategies

Figure 7: Frequency of fish consumption per month



Majority of respondents, 59%, consume fish more than five times per month, reflecting a high level of dependence on fish as a dietary staple in Pakwach District. This is followed by 17% who consume fish once a month, 16% who eat it 2–3 times, 7% who never consume fish, and only 2% who consume it 4–5 times. The high consumption frequency suggests that fish is both a culturally and nutritionally important food source for most households. However, the small proportion that never consumes fish may reflect barriers such as affordability, availability, or dietary preferences.

4.3.2. The preferred fish attributes by the consumers in pakwach district

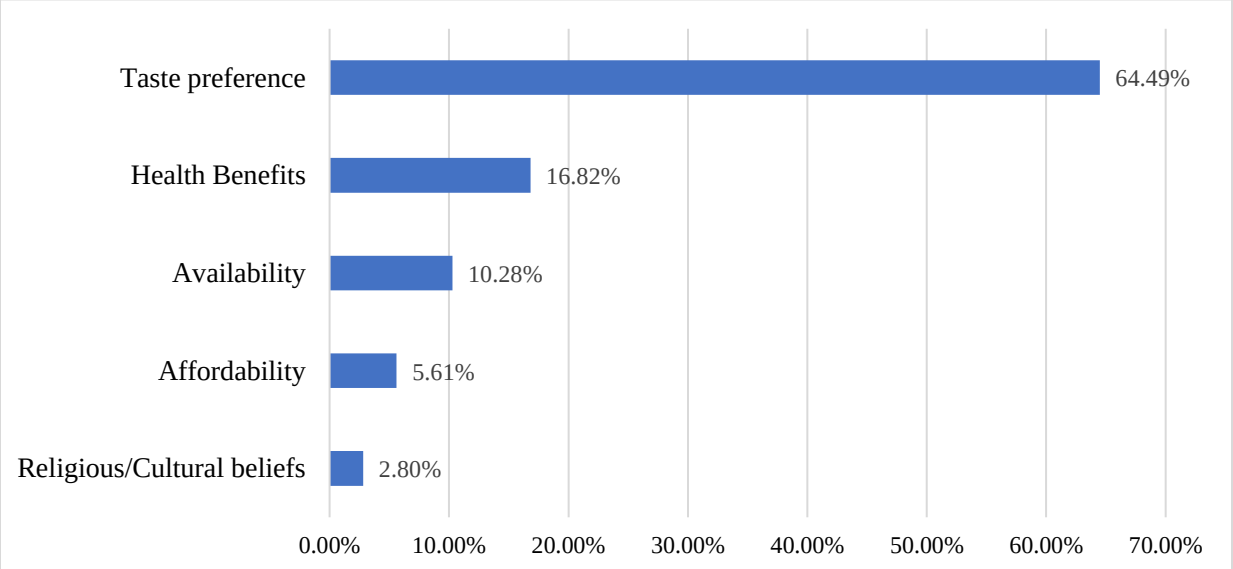
Table 2: Preferred fish attributes by the consumers in Pakwach district

Attribute	Important	Less Important	Not Important	Very Important
Price	16.82%	0.93%	1.87%	80.37%
Taste	55.14%	0..00%	0.93%	43.93%
Availability	39.25%	2.80%	0.93%	56.07%
Nutritional Value	56.07%	0.93%	0.93%	40.19%
Cultural Preference	15.89%	6.54%	35.51%	42.06%

The results in Table 1 indicate that price is the most critical attribute for fish consumers in Pakwach District, with 80.37% rating it as very important and another 16.82% as important, totaling over 97% recognizing its relevance. This highlights the cost-sensitivity of households, especially considering the relatively low average monthly income (UGX 89,701) among respondents. Availability also ranks highly, with 56.07% rating it as very important and 39.25% as important, showing that ease of access significantly influences consumption. Similarly, taste and nutritional value were largely considered crucial, with over 96% of respondents rating these two attributes as either important or very important, confirming that both sensory satisfaction and health benefits drive consumer preference.

Cultural preference received mixed reactions: although 42.06% considered it very important, a notable 35.51% rated it not important. This suggests cultural influences are relevant for a substantial segment of the population but are not universally decisive across households. The diverse views on culture likely reflect varying ethnic, religious, or generational perspectives within the district. These results justify that while multiple factors influence consumer choice, economic and practical considerations (price and availability) dominate decision-making in a low-income setting like Pakwach, followed by personal satisfaction (taste) and health awareness (nutritional value).

Figure 8: Main reason for consuming fish



The primary reason for fish consumption among respondents in Pakwach District is taste preference, by a dominant 64.49% of participants. This highlights the strong influence of sensory satisfaction in shaping dietary habits, suggesting that flavor and palatability are central to fish selection. Health benefits followed at 16.82%, indicating that a notable portion of consumers also value fish for its nutritional contribution, such as high-quality protein and essential fatty acids. Other reasons like availability (10.28%) and affordability (5.61%) were less influential, and only 2.80% attributed their choice to religious or cultural beliefs. This pattern implies that while practical and cultural factors do play a role, personal taste overwhelmingly drives fish consumption decisions in the district, which is crucial for informing promotion and marketing strategies for specific fish species

4.4 The factors influencing the frequency of fish consumption among households in Pakwach district

Table 3: Logistic regression results on factors influencing the frequency of fish consumption

Fish consumption	Coefficient.	Std error	p-value
Age in complete years	0.018	0.018	0.304
Gender of the household head (1=Female, 0 = Male)	0.002	0.564	0.997
Marital status (1= Married, 0 = Otherwise)	-0.014	0.571	0.981
Household size	-0.092	0.078	0.238
Education level of the household head (years)	0.76	0.453	0.093*
Respondent's Occupation (1=Farmer, 0 = Others)	-0.18	0.49	0.714
Monthly Income in Uganda Shillings (Log scaled)	0.127	0.188	0.498
Received training in the last one month (1 = Yes, 0 = No)	-0.313	0.983	0.75
Distance to the nearest food market (km)	-0.11	0.062	0.074*
Residence (1= Rural, 0 = Rural)	-0.371	0.46	0.419

Constant	-1.349	2.26	0.55
Number of observations	107		
Pseudo R^2	0.0927		

The regression results in table 3 show that education level of the household head and distance to the nearest market significantly influenced the frequency of fish consumption among households in Pakwach District at the 10% level of significance.

Education exhibited a positive relationship (OR = 0.76, p = 0.093), suggesting that households headed by individuals with higher levels of education were more likely to consume fish eight times a month. This implies that education improves awareness of the nutritional benefits of fish, leading to healthier dietary practices. Conversely, distance to the nearest food market had a negative relationship (OR = -0.11, p = 0.074), indicating that households farther from markets were less likely to meet the recommended fish consumption frequency. This shows the role of physical accessibility in shaping dietary behaviors, as longer distances likely increase transaction costs and limit availability, reducing household consumption levels.

Other variables, such as age, gender, marital status, household size, occupation, income, and training on nutrition, were not statistically significant predictors of frequent fish consumption ($p > 0.10$). This suggests that while socio-economic and demographic factors may play a role in shaping overall food consumption, they did not have a strong or consistent effect on households' ability to meet the recommended fish intake in this context.

4.5 Challenges faced by consumers in accessing fish in Pakwach district and coping mechanism employed

4.5.1 challenges faced by consumers in accessing fish in pakwach district

Table 4: Challenges faced by consumers in accessing fish

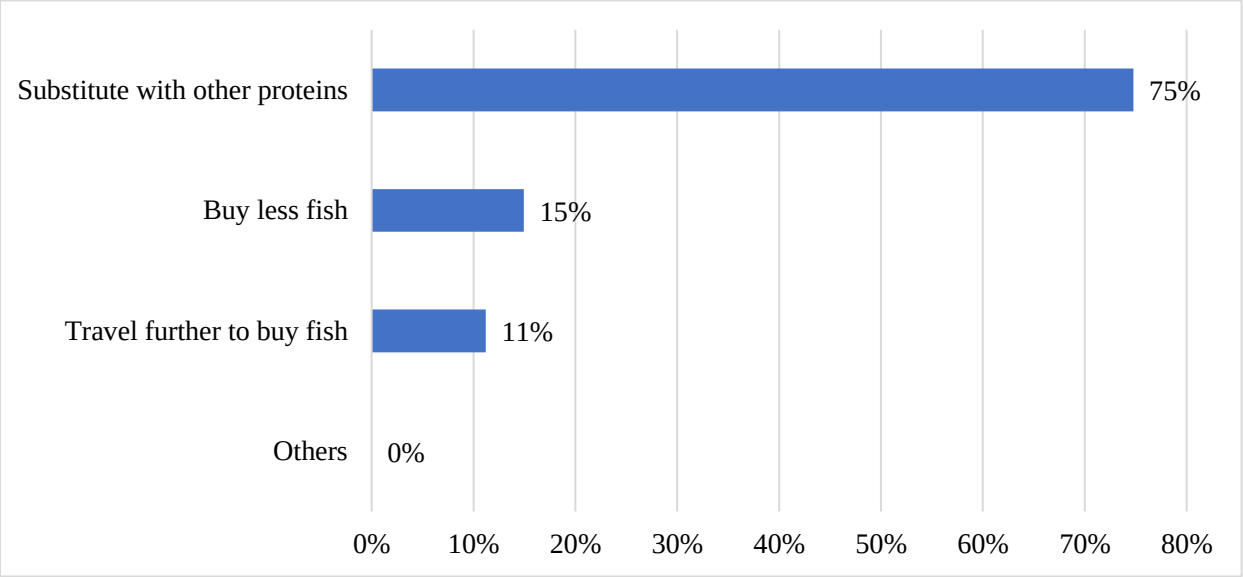
Challenge	Count	Percentage	Rank
High prices	66	62%	1
Poor storage facilities	12	11%	2
Limited supply	12	11%	2
Long distances to markets	7	7%	5
Poor quality fish	12	11%	2
Others	1	1%	6

The most prevalent challenge faced by consumers in accessing fish in Pakwach District is high prices, by 62% of respondents. This finding aligns with earlier results showing that price is a critical factor influencing fish consumption frequency. The dominance of high cost as a barrier suggests that despite the district's proximity to major water bodies like Lake Albert and the River Nile, affordability remains a major concern for most households—especially those with low or irregular incomes. This economic limitation reduces the ability of many families to access sufficient and regular fish protein, contributing to dietary gaps and potential food insecurity. Therefore, interventions such as price subsidies, tax relief on fish products, or support for local fish farming could help alleviate the financial burden on consumers.

The second tier of challenges includes poor storage facilities, limited supply, and poor quality fish, each reported by 11% of respondents. These issues point to systemic problems in the fish supply chain, including inadequate infrastructure for preserving fish, seasonal fluctuations in catch volumes, and possible mishandling during processing and distribution. Such conditions not only affect access but also diminish consumer trust in the safety and freshness of fish. Long distances to markets were noted by 7% of respondents, indicating that for a smaller but significant portion of the population—especially in more remote rural areas—geographic access also limits consumption.

4.5.2 coping mechanism employed to overcome fish challenges

Figure 9: Coping mechanism with Fish access challenges



The majority (75%) of respondents substitute fish with other protein sources, such as beans, meat, or legumes. This indicates that when faced with barriers like high prices, poor quality, or limited availability, most households resort to dietary alternatives rather than increasing effort or cost to access fish. While this ensures protein intake is maintained, it may compromise the unique nutritional benefits that fish offers—especially in providing essential fatty acids and micronutrients critical for health. This pattern also reflects the economic constraints many households face, where flexibility in dietary options is driven more by affordability than preference.

In addition, 15% of respondents reported buying less fish, demonstrating a reduction in consumption rather than replacement. Only 11% cope by traveling further to buy fish, possibly due to the associated costs and time burden. The absence of respondents under the "others" category suggests that alternative coping strategies are either rare or not perceived as viable. These findings justify the need for interventions that reduce fish prices, improve local supply chains, and enhance affordability—particularly through community-level fish markets, cooperative purchasing models, or small-scale aquaculture initiatives in Pakwach District.

CHAPTER FIVE

DISCUSSION OF THE RESULTS

This chapter present the discussions of the objectives beginning with the most common type of fish consumed and preferred fish attributes, factors influencing fish consumption choices, and the challenges consumers face in accessing fish in Pakwach District

5.1 The most common type of fish consumed and the preferred attributes by consumers

This study found out that Tilapia is the most commonly consumed fish in Pakwach District, accounting for 46% of responses, followed by Nile Perch (21%) and Catfish (19%). This is consistent with findings by Adewumi et al. (2020) who reported that Tilapia is the most preferred fish species in many parts of sub-Saharan Africa due to its soft bones, mild taste, and wide availability. Similarly, Musinguzi et al. (2019) in their study around the Lake Victoria basin found Tilapia consumption to be dominant in Ugandan households, citing familiarity and ease of cooking. However, these findings differ slightly from those by Kunda et al. (2021) in Zambia, where Catfish ranked highest due to its longer shelf life when smoked. The higher preference for Tilapia in Pakwach can be attributed to its local availability and consumer trust. In terms of attributes influencing preference, the study found that taste, price, availability, and nutritional value were the most critical factors. This aligns with Boniface et al. (2017), who observed that consumer preferences for fish are strongly guided by sensory appeal and cost considerations, particularly in rural African communities. Similarly, Mhlanga and Mbiriri (2020) reported in Zimbabwe that taste and affordability are the top drivers of fish consumption, with price significantly influencing the quantity and frequency of purchase. The results also support Olafsdóttir et al. (2021), who emphasized that freshness and nutritional awareness play a growing role in consumer food choices in developing countries. On cultural influence, the study found mixed views. Although cultural preferences were acknowledged, they were less significant compared to taste and affordability. This partly contrasts with findings by Abdulai and Ohene-Yankyera (2015), who emphasized the role of tradition and religion in fish preference among Ghanaian households. However, Kamau and Mungai (2018) noted that in peri-urban and semi-rural Ugandan settings, economic factors have begun to outweigh cultural considerations in dietary choices. These variations can be explained by the increasing exposure to nutritional education and market constraints.

5.2 Factors influencing the frequency of fish consumption among households in Pakwach district

The results indicate that education level of the household head significantly influenced the frequency of fish consumption, with more educated household heads being twice as likely to consume fish at least three times per week compared to their less-educated counterparts. This suggests that education enhances awareness of the nutritional benefits of fish and encourages healthier dietary practices. In a study by Murendo et al. (2018) in Zimbabwe, where higher education was positively associated with dietary diversity, including fish consumption, reported similar findings. Likewise, Mhlanga and Mbiriri (2020) found that education plays a pivotal role in shaping consumer awareness and food choices, particularly in low-income households. In Uganda, Musinguzi et al. (2019) highlighted that better-educated households around the Lake Victoria basin were more consistent in consuming fish due to their appreciation of its health benefits. These findings resonate with Oluwatusin and Shittu (2014), who emphasized that nutrition knowledge, often correlated with education, increases the likelihood of adopting recommended dietary practices. Therefore, education emerges as a critical factor in promoting compliance with the FAO-recommended fish intake of at least two servings per week.

In contrast, distance to the nearest market exhibited a negative influence on fish consumption, with households located farther from markets being less likely to consume fish frequently. This reflects the impact of physical accessibility and transaction costs on food choice and availability. A study by Adewumi et al. (2020) noted that long distances to fish markets reduce consumption frequency, particularly in rural African settings where transport networks are poor. In Malawi, Chirwa and Matita (2020) observed that proximity to fish landing sites was a major determinant of consumption, with distant households consuming fish less regularly. Comparable findings by Kamau and Mungai (2018) in Kenya revealed that households closer to markets had greater access to fresh fish and were thus better able to meet nutritional recommendations. Furthermore, Njiru et al. (2019) highlighted that market access is central to achieving food security in fishing communities, as reduced accessibility discourages frequent purchases and promotes reliance on substitutes. These results imply that infrastructural barriers, such as poor road networks and market location, constrain households from achieving the recommended fish consumption levels in Pakwach District.

5.3 Challenges faced by consumers in accessing fish and coping mechanism employed

This study found that high prices were the most significant challenge faced by consumers in accessing fish in Pakwach District, with 62% of respondents identifying it as a major barrier. This finding is consistent with studies by Boniface et al. (2017) and Abila and Othina (2006) who highlighted that fish prices in many East African communities are often prohibitive, especially for low-income households. Similarly, Musinguzi et al. (2020) noted that fluctuating prices driven by seasonal supply and market inefficiencies limit regular fish consumption. The dominance of price as a barrier suggests that despite proximity to water bodies rich in fish, economic constraints prevent adequate access.

Other notable challenges included poor storage facilities, limited supply, and poor fish quality, each reported by 11% of respondents. These findings align with Kaminski et al. (2014) and Mhlanga and Mbiriri (2020), who observed that lack of cold storage infrastructure and poor handling practices reduce fish availability and quality in many rural African markets. This can result in increased spoilage and consumer reluctance to purchase fish, further limiting access. Additionally, long distances to markets were identified by 7% of respondents as a challenge, echoing Okello et al. (2021) who found that geographic isolation in rural Uganda significantly impacts food access.This highlights the multifaceted nature of access issues that go beyond just affordability.

Regarding coping mechanisms, the study found that the majority (75%) of consumers substituted fish with other protein sources such as beans or meat when faced with access challenges. This coping strategy is similar to what Nayiga et al. (2018) and Mwangi et al. (2019) found in their studies, where households rely on alternative proteins to maintain nutritional intake when fish is unavailable or unaffordable. Additionally, 15% of respondents reported buying less fish, and 11% traveled further distances to access fish, indicating varying adaptive responses based on household resources. These coping mechanisms underline the need for targeted interventions to improve fish affordability, market infrastructure, and supply consistency in Pakwach District to enhance dietary quality and food security.

CHAPTER SIX

SUMMARY OF RESULTS, CONCLUSION AND RECOMMENDATION

6.1 Introduction

This chapter presents a summary of the key findings from the study. It also provides conclusions drawn from the analysis and discussion, followed by practical recommendations aimed at addressing the identified challenges and enhancing fish consumption and accessibility in the district. The chapter closes with suggestions for further research to build on the insights gained from this study.

6.2 Summary of results

This study found that Tilapia was the most commonly consumed fish species in Pakwach District, preferred by 46% of respondents, followed by Nile Perch and Catfish. Key attributes influencing fish choice included taste, price, availability, and nutritional value, with taste being the primary reason for consumption for most households. These preferences reflect both cultural inclinations and practical considerations such as affordability and local availability, highlighting the importance of sensory appeal and health awareness in shaping consumer behavior.

Logistic regression results revealed that the education level of the household head and distance to the nearest market were significant predictors of consumption frequency at the 10% level. Specifically, households with better-educated heads were more likely to meet or exceed the recommended consumption of at least two servings of fish per week, reflecting higher awareness of nutritional benefits. However, households located farther from markets consumed fish less frequently due to reduced accessibility and higher transaction costs. These findings resonate with descriptive evidence, where 59% of respondents reported consuming fish more than five times a month, yet some households cited affordability and accessibility as constraints.

The study further identified high prices as the main challenge faced by consumers in accessing fish, cited by 62% of respondents, followed by poor storage facilities, limited supply, and poor-quality fish. To cope, the majority of households substituted fish with other protein sources, while others reduced their fish purchases or traveled further to buy fish. These challenges underscore the need for interventions to improve fish affordability, market infrastructure, and supply consistency in Pakwach District to enhance food security and nutritional outcomes.

6.3 Conclusions

This study concludes that Tilapia is the predominant fish species consumed in Pakwach District, favored primarily for its taste, availability, and nutritional benefits. Consumer preferences are strongly influenced by sensory attributes such as taste, but practical factors like price and accessibility also play critical roles. These preferences align with regional patterns observed in other East African communities, confirming the cultural and economic significance of Tilapia in local diets.

The analysis further concludes that the frequency of fish consumption among households is significantly influenced by socio-economic and demographic characteristics, particularly education level and distance to markets. Households with better-educated heads were more likely to consume fish frequently, reflecting greater nutritional awareness and appreciation of its health benefits. In contrast, households located farther from fish markets consumed fish less often due to accessibility challenges and higher transaction costs. While 59% of households reported consuming fish more than five times a month, both affordability and distance emerged as persistent barriers. The regression findings therefore underscore the importance of strengthening nutritional education and improving market accessibility in order to sustain and increase fish consumption across all households.

This study highlights high fish prices as the main barrier to fish access in Pakwach District, accompanied by challenges related to poor storage facilities, limited supply, and fish quality. Consumers adopt various coping mechanisms, such as substituting fish with other proteins or reducing consumption frequency, which may affect nutritional outcomes. Addressing these challenges through targeted policies and improved market infrastructure is essential to support sustainable fish consumption and enhance food security in the district.

6.4 Recommendations

Based on the results on the common fish types consumed, this study recommends that local fisheries and market stakeholders prioritize the sustainable production and supply of Tilapia, Nile Perch, and Catfish, as these species align with consumer preferences in Pakwach District. Efforts should be made to promote awareness campaigns emphasizing the nutritional benefits of these fish species, especially targeting households with lower education levels to enhance informed

consumption choices. Encouraging diversification in fish species available could broaden consumer options and improve dietary variety.

To enhance fish consumption in Pakwach District, the study recommends interventions that focus on improving household nutritional awareness through education campaigns, particularly targeting communities with lower education levels, to emphasize the health benefits of fish. In addition, policies and programs should prioritize improving market accessibility by establishing more local fish outlets, enhancing transport infrastructure, and supporting cold storage facilities to reduce distance-related barriers. Addressing these constraints would not only increase the frequency of fish consumption but also ensure equitable access across households, thereby contributing to better nutrition and livelihoods in the district.

To overcome the challenges faced in accessing fish, especially the issue of high prices and limited supply, this study recommends investing in improved fish storage and preservation infrastructure, such as cold storage facilities, in key market areas within Pakwach District. Enhancing local fish processing capabilities can reduce post-harvest losses and improve fish quality. Additionally, policies that regulate and support sustainable fishing practices will help maintain fish stocks and ensure steady supply. Expanding market access by improving transportation and reducing distances to markets can further ease consumer access to fish, while programs that encourage alternative livelihoods may reduce pressure on fish resources.

6.5 Areas for Further Research

While this study has provided useful insights into fish consumption patterns, influencing factors, and challenges in Pakwach district, further research is needed to broaden the scope and deepen understanding. Future studies could examine the role of gender dynamics and intra-household decision-making in influencing fish consumption, as this may reveal hidden social factors not captured in this research. In addition, longitudinal studies could track seasonal variations in fish availability and affordability, thereby providing a clearer picture of how consumption fluctuates over time. Comparative studies across different districts along the Nile could also generate valuable lessons on best practices for improving access and addressing supply chain constraints.

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Appendix i: Questionnaire

Title: Consumer Preferences for Common Fish Species in Pakwach District

Dear Respondent,

Greetings! My name is Rwothongeyo Pilate, a student of Makerere university, currently undertaking a research study titled "Consumer Preferences for Common Fish Species in Pakwach District"

The purpose of this research is to understand the preferences, consumption habits, and factors influencing consumer choices regarding different fish species commonly sold and consumed in Pakwach District. Your views are extremely valuable in helping to inform future fisheries management strategies, market development, and sustainable fish supply chains.

This questionnaire is designed to collect relevant data from consumers like you. It contains both closed-ended and open-ended questions and is estimated to take approximately 15–20 minutes of your time.

Please note the following:

Voluntary Participation: Your participation in this study is entirely voluntary. You have the right to decline or withdraw at any time without any penalty.

Confidentiality: All information provided will be treated with strict confidentiality. Your identity will not be disclosed, and the data collected will only be used for academic purposes.

Anonymity: No names or personal identifiers will be included in the final report or shared with any third parties.

Consent: By proceeding with this interview or filling out this questionnaire, you are giving your informed consent to participate in this academic research.

We kindly request your cooperation and honest responses to help ensure the success of this study. Your input is greatly appreciated!

Thank you very much for your time and support.

Do you consent to participate in this study?

☐ Yes ☐ No

If yes, kindly proceed to the next section.

Instructions: Please answer all questions honestly. Your responses will remain confidential and used only for academic research purposes.

Section A: Demographic Information

1. Age of the household head (In complete years) .....
2. Gender: ☐1= Male ☐0= Female
3. Marital Status: 0=☐ Single ☐ 1=Married ☐ 2=Divorced ☐3= Widowed
4. Household Size (number of people living in the household): .....
5. Years spend in school by the house hold head **……**
6. Occupation: 0=☐Fisher 1=☐ Farmer 2=☐ Civil Servant 3=☐ Student ☐ Other (Specify) _____
7. Estimated monthly income of the house hold head……
8. Residence: 0=☐ Urban 1=☐ Rural
9. In the last 12 months, did your household receive any training or other information about nutrition and good feeding for your household

1=☐yes, 2=☐no

10. If yes to question 9, indicate the main source of the training/information:

    0=☐Government workers 1=☐ NGOs 2=☐Radio 3=☐Neighbors and friends 4=☐ Others (specify)…….

11. What's the distance from your homestead to the nearest food market (in Km)……

Section B: Common Fish Consumed and Preferred Attributes

12.How many times do you consume fish in a month?

0 =☐ Never, 1 = ☐Once 2 = ☐2-3 times, 3=☐4-5 times, 4=☐More than 5 times

13.If frequency is more than a month, how many times do you consume it in four months?.....

14. What type of fish do you consume most? (Tick all that apply) ☐ 1 = Tilapia ☐ 2 = Nile Perch ☐ 3 = Catfish ☐ 4 = Lungfish ☐ 5 = Silverfish (Mukene) ☐ 6 = Other (Specify) _____

15.What type of fish is most preferred for this household? (tick all that apply)

☐ 1 = Tilapia ☐ 2 = Nile Perch ☐ 3 = Catfish ☐ 4 = Lungfish ☐ 5 = Silverfish (Mukene) ☐ 6 = Other (Specify) _____

16.Rate the importance of the following factors in your choice of fish (1 = Not Important, 5 = Very Important):

Factor	1	2	3	4	5
Price	☐	☐	☐	☐	☐
Taste	☐	☐	☐	☐	☐
Availability	☐	☐	☐	☐	☐
Nutritional Value	☐	☐	☐	☐	☐
Cultural Preference	☐	☐	☐	☐	☐

17, How do you prefer your fish?
☐ 0 = Fresh ☐ 1 = Smoked ☐ 2 = Dried ☐ 3 = Fried ☐ 4 = Other (Specify) _____

18. Where do you usually buy your fish?
0=☐Market 1=☐Local Vendors 2=☐Supermarket 3=☐Direct from Fishermen Other (Specify) _____

Section C: Factors Affecting Decisions to Consume Different Fish Species

19. What factors influence your decision to consume different type of fish species? (tick that apply)

0=☐household size 1=☐gender 2=☐income 3=☐access to nutrition information 4=☐ age of the household head 5=☐education 6=☐distance to the market 7=☐ others (specify)

20. What is your main reason for consuming fish for this household?

0=☐ Affordability 1=☐ Health Benefits 2=☐ Taste Preference 3=☐ Availability 4=☐ Religious/Cultural Beliefs

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Section D: Challenges in Accessing Fish

21. In the table below rate the challenges in accessing for consumption fish in the following order (1= agree, 2=strongly agree, 3= disagree)

challenges	1	2	3
Price of the fish	☐	☐	☐
Distance to the market or landing site	☐	☐	☐
Seasonal variation in supply	☐	☐	☐
Poor quality or freshness	☐	☐	☐

Others

challenges	1	**2**	**3**
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐

22. What do you think can be done to address these challenges?

Challenges	Suggested solution
High price of the fish	
Distance to the market or landing site	
Seasonal variation	

Section E: Additional Comments

24. What recommendations do you have for improving fish availability and consumption in Pakwach District?

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