TABLE OF CONTENTS

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Worldwide, around 57million people work in fish production, a third of them in aquaculture. Global total capture is 93.4 million tons in 2014 with around 4.6 million vessels of which 90% are in Asia and Africa (FAO, 2016; Oluwasola et al., 2015; Mvodo et al., 2018). Despite this, many countries continue to face food shortages and nutrition inadequacies (Komukama, 2011). In Africa, Morocco and Senegal are top producers of marine fish, while Uganda, Tanzania and Nigeria are among major fish producing countries of inland waters, with production levels of about 407,638; 314,945 and 312,009 tons respectively (FAO, 2017). Africa is amongst the top fish producers, its supply of fish remains alarmingly low. Fish still contributes to food security in many regions of the world providing a valuable supplement for diversified nutritious diets.

In Cameroon, like in most Sub-Saharan African countries, traditional fishing is practiced in almost all rivers, lakes, ponds and represents an important part of total fish captures. It is an important sector in the National strategies to fight against poverty and food safety. In Cameroon, fish is available from both external and domestic productions. Due to high demand (about three million tons), Cameroon imports about 20,000 – 60,000 tons from China and Mauritania respectively, representing an average of 50% of the volume of imports (Tambi, 2001). In 2015, over 100 billion FCFA was spent on the importation of 150,000 tons of fish. Annually, Cameroon produces 176,000 tons with only 1000 tons originating from aquaculture. The sector currently contributes up to nearly 5% of Cameroon’s Gross Domestic Product (GDP). Total

consumption of fish in Cameroon has increased by more than 24,000 metric tons from 104,300 metric tons in the period of 1980-1998 (Tambi, 2001).

Fish import in Cameroon decreased to 385.08FCFA billion in 2013 from 3,325.16 FCFA billion the previous year. Imports in Cameroon averaged 1,961.39 FCFA billion from 2001 until 2013 reaching an all-time high of 3,325.16 FCFA billion in 2010. The estimated demand is influenced by socioeconomic and cultural factors both in rural and urban households (Camstat, 2017). The shift in food preferences is not only occurring in Cameroon. There are major changes throughout the world, towards more diversified diets resulting from emerging socio-demographic factors (Kearney, 2010). These changes come with considerable health consequences; malnutrition (under nutrition and micro-nutrient deficiencies) mostly in developing countries (Cornelsen et al., 2016; Pieters et al., 2013). At regional, urban and village levels especially Buea Municipality, factors such as; income distribution, poverty, availability and accessibility of fish products as well as preferences influence smoked fish consumption. In many developing countries like Cameroon and Buea municipality to be specific, fish is mainly for direct human consumption. Though it is consumed in all parts of Cameroon, disparities caused by the aforementioned socio-economic factors exists between rural and urban households.

Fish production which is also known as fish farming was introduced in Cameroon in 1948 and the country has been working on several projects in the sector of aquaculture to enhance the adoption of fish farming in the country (MINEPIA, 2009). Fishes are one of the most important group of vertebrates serving as food for human. They possess a great economic, nutritional, medicinal, industrial, aesthetic and religious values

as well as providing employment for millions of people in the world. They contribute to food security in many regions of the world, providing a valuable supplement for diversified and nutritious diets. Consumption of fish has several health, nutritional, environmental and social advantages over other terrestrial animal meat. Edible tissues of fish are appreciably greater than that in chicken, pig and sheep/goat. It provides tasty, low calorie meal but is a good source of high quality protein. Fish is an almost zero carbohydrate food, good for diabetes and other such patients. The protein content in fishes varies from 15-30% on weight basis and 60-80% on dry weight basis. Fish is a good source of vitamins A, B and D and also offers a good source of calcium, iodine, fluorine, magnesium and zinc. Fish are rich in poly unsaturated fatty acids containing omega-3. Fish is low in fat, high in protein and an excellent source of omega-3 fatty acids. Regular consumption of fish can reduce the risk of various diseases and disorders (FAO, 2012). Some research findings indicate the following diseases Asthma, brain and eyes, cancer, cardiovascular disease, depression, diabetes fish will help in the treatment of these diseases. Fisheries and aquaculture sector in Cameroon provide, either directly or indirectly, a great employment opportunity for millions of people around the country. In 2012, many people were directly engaged in part time or full time, in production of fish either in fishing or in aquaculture.

The role of aquaculture in the Cameroon economy is marginal as the sector employs only about 3500 to 4200 people for a production of about 870 tons (FAO, 2009). The species cultivated in Cameroon are; the Nile tilapia (Oreochromis niloticus), Catfish (Clarias gariepinus), Common carp (Cyprinus carpio), African bonytongue (Heterotis niloticus), etc. Transportation of fisheries products is still rudimentary

with the use of local techniques. This is done either by road, sea or by the railway. By road smoked fish is either packaged into cartons tied with rubber bans or in baskets and covered with paper, then stocked in trucks. Fresh fish products by road are transported in isothermal trucks by fish traders and in ice coolers and iced drums by wholesalers. By railway, smoked products mostly are transported from fish producing areas to other cities like Buea, Yaounde, Mbange, Kumba, Ngoundere. The principal markets for fishery products are both internal and external. The internal markets include fishmongers, fish traders, restaurants, wholesalers who are responsible for the marketing and commercialization of these products. In Buea, fisheries products are stocked in cold stores and either sold to the local populace or distributed to other cities around the market place. Fish traders in Buea sold fresh fish in basins, buckets, baskets for small pelagic and in kilograms, hips, buckets and sometimes basins for demersals (Chiambeng, 2011). The marketing of the fish products is by counting in pairs per thousand francs CFA in the fishing ports. Fish traders from the different regions of the country always visit these coastal fish markets and purchase smoked fish in large quantities and they transport either by car or by train to different cities and sell in small quantities ranging from 100 to 1000frsCFA. These cities are Bafoussam in the Western region, Bamenda in the North western region and Yaounde in the Central region. According to FAO statistics (FAO, 2007) annual fish consumption is at 15,5kg/inhabitant while annual fish requirement for the population is at 247500 tons. The townships of Buea, Douala and Yaounde consume three quarters (80%) of the fishery products landed in Cameroon (Chiambeng & Ngoande, 2011).

Artisanal fish production in Cameroon has faced an upward trend from

1950 till date. From 1950 to 1970, the production stood at around 20000tons per years. From 1970 to the 80s, it further increased to 1bout 60000tons. In addition, in the 90s, there was an increase to 70000tons and above 90000tons in the early 2000s. There was a drop in production from 2000 to 2005 from about 90000tons to 70000tons. Uptill 2010, the production remained at 70000tons. Furthermore, from 2010 to 2015, production greatly increased to about 15000tons and to 17000tons in 2016 from which the increase in production continued steadily till date. The graph below shows artisanal fishing in Cameroon waters from 1950 till 2016;

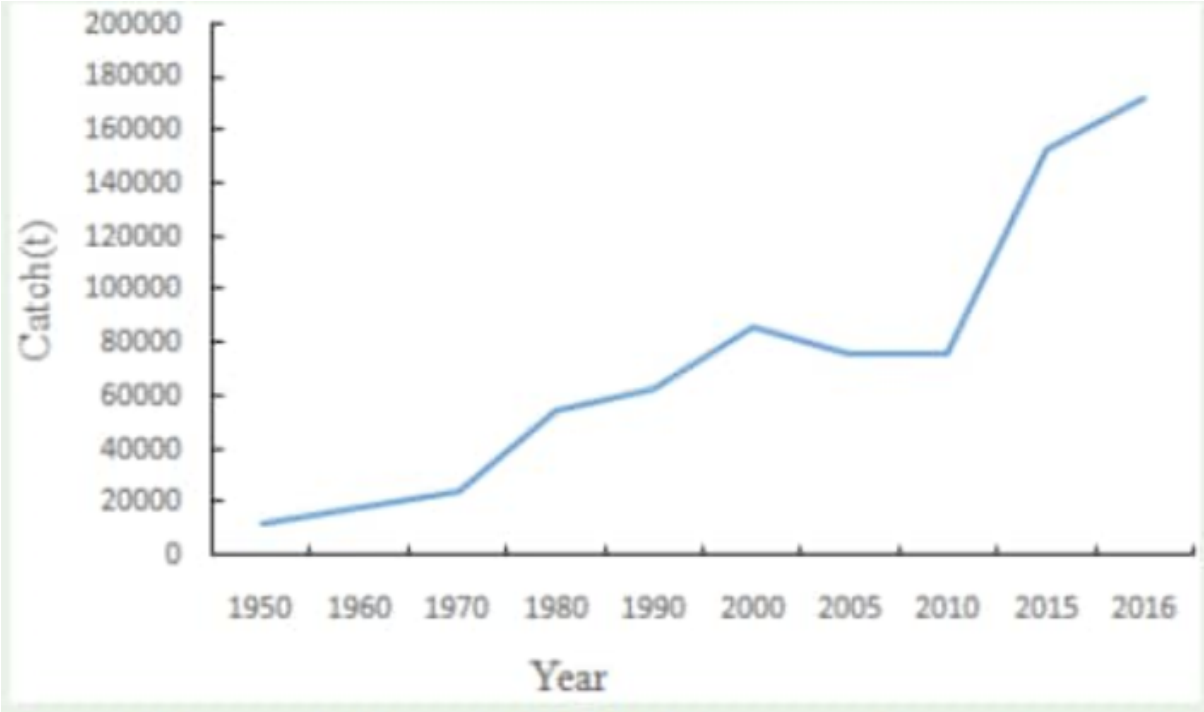


Figure 1.1 : Reconstructed artisanal fishing in Cameroon waters from 1950 – 2016 (FAOSTAT)

Recently, the government has started giving the priority to the sector to set up a legal strategic framework governing fisheries and aquaculture in Cameroon. Fish farming occupies an area of about 250ha, out of an estimated population of 10,000 fish farmers (PNVRA) 6 percent, or

about 600, are female pond owners (Fisheries Directorate MINEPIA, 2000-2000). In Cameroon the only form of fish production being practised in freshwater pond (Satia, 1991) in both dammed ponds and diversion ponds. Dammed ponds were the first ponds built in Cameroon and could not be completely emptied, running parallel to the valleys. Due to the difficulty of managing those ponds, the second series of ponds built after 1974 have been diversion ponds, all of whose production parameters are controllable. Fish culture began in country with tilapia followed by catfish and mostly practiced by small farmers and today government have gradually established 22 breeding centres, which are used for extension work. The accessibility of fish farmers in the Douala has actually been neglected to an extend maybe due to policies, ignoring of some because they have low income and small enterprises in favour of large scale enterprises which are literate enough to satisfy their stringent loan conditions. Marketing plays an important role in a market economy of a country. Fish farming is mostly for local consumption, fish is sold around the ponds. Sometimes, fish is taken to the market or to the restaurants and sold at normal prices (around 1000 CFA francs per kilogram of tilapia and 1500 CFA francs per kilogram of catfish).

Fish consumption has undergone major changes in the past four decades. World per capita fish consumption has increased steadily from an average of 9.9kg in the 1960s to 11.5kg in 1970s, 12.5kg in the 1980s, 14.4kg in the 1990s, 16.4kg in the 2000s and rising above 20kg in 2016 (FAO, 2016). However, this increase has not been uniform across regions. The global increase in fish consumption tallies with trends in food consumption. Generally, per capita food consumption has been rising, and in the past few decades nutritive standards have shown positive long term trends, with worldwide increase in the average global

calories supply per person. Globally, fish provides 6.7% of all protein consumed by humans as well as offers a rich source of long-chain omega-3fatty and amino acids, vitamins calcium, zinc and iron (FAO, 2016).

Fish is one of the healthiest animal sources. Its lack of connective tissues makes it easy to digest. Very efficient in the prevention of cardiovascular diseases, high blood pressure, cholesterol, Alzheimer's disease and various types of cancer, fish consumption contributes up to 108kcal per capita per day (Can et al., 2015; Erdogan et al., 2011; Oluwasola et al., 2015; Kearney, 2010; Kudzanayi et al., 2015; Mvodo et al., 2018). While the recommended minimum animal protein consumption rate is 12.5kg and the required average protein intake by the Food and Agriculture Organization of the United Nations (FAO) is 75g/caput/day (Erdogan et al., 2011; Kearney, 2010). Approximately, 16% of the animal protein consumed by the world's population is derived from fish (Komukama, 2011).

According to Clover (2005), fish is the best source of fat-free protein and vitamins and that, the omega-3-fatty acids in oily fish gives optimum brain function, reduces the danger of heart attacks, strokes and osteoporosis. Communing fish has been found to slow down the ageing process while enabling people to lose weight because a fishy diet swites off the hunger hormone thus making people feel satisfied on smaller and more nutritious amounts of food. There is also a high demand for fish because it is an important source of cheap first class protein, providing essential amino acids (Paul & Southgate, 1978). And calcium, phosphorus, vitamin A and D (Brigette, Brigette, &Corlein, 1994). Fish is also quicker to cook and more easily digested than meat (Mayhew & Penny, 1988).

Yet, fish is an extremely perishable commodity, spoiling soon after death due to microbial actions, which results in disagreeable taste, smell and texture thereby reducing consumer acceptability (Garrow& James, 1994). Maddison, Machell& Adams (1993) suggest the use of refrigeration as a means of preventing the fast rate of deterioration in fish. However, some bacteria such as Salmonella, which survive in refrigerators and brine, can only be destroyed by heating of smoking (Bender, 1982). In Cameroon, various methods are used to preserve fish; namely, refrigeration, smoking, salting, drying and steaming. Fish smoking which is big business for consumers and marketers is the focus of this study.

Fish smoking in Cameroon is traditionally carried out by women in coastal towns and villages, along river banks and shores of lakes. In most fishing communities, the main economic activity of women is fish processing (Essuman, 1992). Depending on the type of fish to be smoked, it uses possible storage period, the smoking process can take the form of “wet-hot smoking or dry-hot smoking. Both processes are carried out temperatures above 80^{o}C, which are high enough to cook the fish (Clucas, 1982). Smoking also preserves fish by drying and depositing natural wood smoke chemicals like phenols and aldehydes, both of which have powerful bactericidal action and prevent the growth of other micro-organisms on the flesh of the fish (Garrow & James, 1994). Smoked fish is also tastier and provides longer shelf-life.

1.2 Problem Statement

Local population have developed traditional fish processing techniques that make use of available natural means, namely sun and wood. In this respect, the mainly sun-dry and smoke-dry more than 75% of fresh fish captured. Fish processing is usually carried out by women. The method includes fish scaling if necessary, evisceration, washing and draining

prior to sun-drying or smoke drying. Smoke drying is carried out in terracotta smoking-rooms using various wood species especially mangroves. Fish are smoked for 2-3 hours at 70 – 80^{o}C, followed by mild smoking (30-35^{o}C) for 24-48 hours. For sun-drying, fish are exposed to sun and free air and are turned over from time to time during 48-72 hours depending on the size of fish and the intensity of sun (Armed et al., 2011).

But the technology employed by local fishermen is not standardized and most parameters remain uncontrolled. Hence, such essential drying parameters as duration, air humidity and temperature are not precisely determined and mastered. In addition, hygienic conditions of fish capture, processing, storage as well as consumption are questionable. These might impact on the nutritional value and safety of processed fish with possible food toxi-infections. The present study is therefore carried out to analyse the consumption of smoked fish in Buea Municipality (Armed et al., 2011).

Smoked fish consumption, frequency, and preferences are affected by consumers' geographic, social, and cultural characteristics. It is known that food preferences are also affected by a number of sensory (taste, smell, texture, etc) and non-sensory factors (income level, price of the commodity, price of substitutes, behaviour, beliefs, personal characteristics, risk perception).

Marketing systems play a decisive role in vibrant economies as mechanisms for both exchange (necessary for specialization and hence leads to higher economic growth) functions and the proper coordination of the exchange (through price signals) which reflect and shape producer and consumer incentives in supply and demand interaction. If small scale domestic producers are to take advantage of the projected

domestic demand growth, then marketing systems in the supply chains linking producers to consumers must be able to support low cost production and timely delivery of the products (Andrew et al., 2008).

Agricultural products particularly smoked fish can only be supplied to satisfy the demand through effective and efficient marketing system which links farm and non-farm communities. For a marketing system to successfully coordinate the interaction of the suppliers and consumers of goods and services must be accompanied by efficient marketing system. Both producers and consumers satisfy their conflicting goals regarding the pricing behaviour of a marketing system through such efficient and competitive marketing systems. In parts of the world, rural people often say that one reason they cannot improve their living standards is that they face difficulties in accessing markets.

Even though livestock products particularly smoked fish have sky rocketing demand in Buea Municipality and beyond. It is widely recognized that inadequate information, inefficient marketing system entailing substantial costs to consumers and less incentives to producers could not provide the mechanism to meet the accelerating demand for high quality food items.

Information concerning the smoked fish marketing system is lacking. Despite the high demand for the smoked fish, producers in Buea are not market oriented and the production system is characterized by its low productivity and scavenging type. This in turn leads to very small supply compared to the high potential the country has in the subsector. Research efforts to increase smoked fish consumption have been underway in Buea. Increased production, however, needs to be accompanied by efficient marketing system that adds place, form, time,

and possession utility to the product along the supply chain. The marketing system for local smoked fish in Buea, particularly in the study areas is poorly developed.

The recent advent of the negative impacts of climate change coupled with numerous allegations of price fixing and other non-competitive practices by some players in the smoked fish value chain in the country, specifically in Buea municipality has rekindled interest on how prices are transmitted along the chain of production. Price transmission studies has been used to understand the functions of agricultural markets and how food prices are determined and transmitted along the entire supply chain particularly in times of food crises.

Asymmetric price transmission of smoked fish along its supply chain will lead to higher prices to consumers, which will cause a fall in the consumption of smoked fish and a shift to its substitute. This will reduce poultry farmers' income due to the shift to the consumption of its substitute. Due to asymmetric price transmission, nutritional insecurity can occur especially for consumers who prefer substitutes such as meat and chicken. This could lead to health problems arising due to lack of balance diet since smoked fish is a rich source of protein but they can't afford because of high prices.

Furthermore, increased water pollution leads to decrease fish availability and hence increased prices. Also, increased deforestation, lead to climate change with negative implications on the availability of wood for drying the fish. Poor storage facilities due to lack of income to purchase storage facilities/ technology, as a result of unemployment, leads to reduced consumption of smoked fish.The causes and effects of reduced consumption pattern of Smoked fish is presented on the

diagram below;

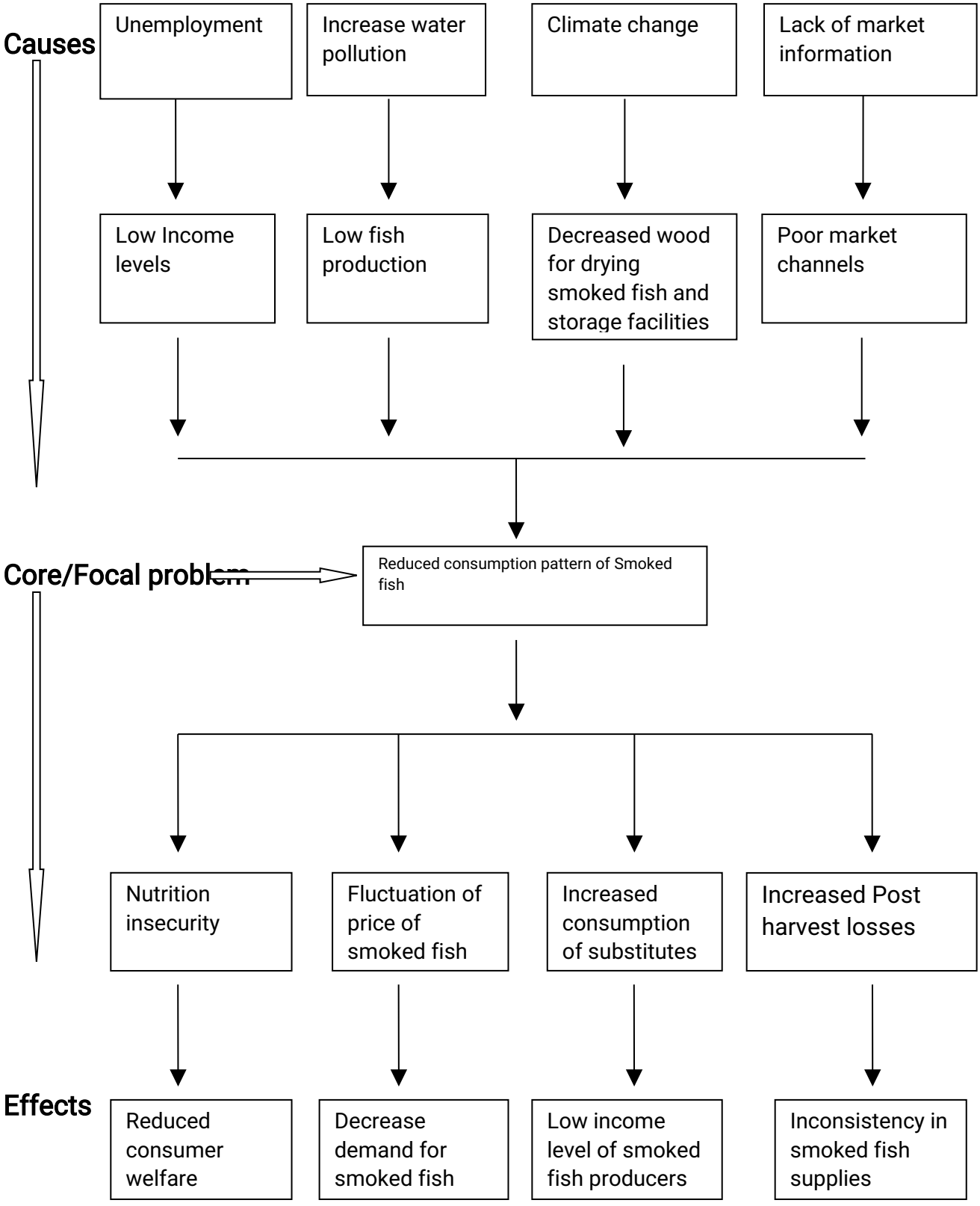


Figure 1.2: Cause and Effect diagram of smoked fish consumption (Source: Author's conceptualization, 2019).

1.3 Research Questions

The problem statement above raises some key questions;

a) Which factors affect smoked fish consumption patterns in Buea Municipality?

b) What is the level and frequency of smoked fish consumption?

c) Are there differences in smoked fish consumption patterns among households?

1.4 Research Objectives

1.4.1 Goal

The goal of this research is;

- To carry out an economic analysis of Smoked Fish Consumption in the Buea Municipality.

1.4.2 Specific Objectives

More specifically, it aims to;

a) Identify the determinants of smoked fish consumption in Buea Municipality

b) Obtain information on smoked fish consumption level and frequency

c) Examine the associations between the socio-economic characteristics of consumers and their preferences.

1.5 Research Hypotheses

This research seeks to test the null hypotheses that;

a) Socio-economic factors have no influence on the quantity of smoked fish consumed.

b) There is no significant difference in the consumption pattern of smoked fish by households.

1.6 Justification of Research

This work is important to various stakeholders;

a) To the Government:

- It provides them with knowledge on the causes of imbalance diet in communities.
- It provides information on the determinants of rural welfare, providing information for good policy making regarding improving household welfare.
- This study also helps development planners and policy makers in designing appropriate policies for the marketing and consumption of smoked fish to enable farmers and other participants benefit.

b) To Researchers:

- It enables researchers to tap on the existing knowledge on consumption patterns of smoked fish.

d) To Students:

- It also serves as a guide for further research in this field of studies.
- It will impact knowledge on household consumption of smoked fish.

i) To the public/ farmers:

- It provides information on diversified household consumer behaviour.
- It also examines the role of households in food security.
- The study is helpful to farmers, traders and service providers involved in the consumption of smoked fish in the study area.
- Moreover, the information can be provided for potential investors along the supply chain to determine consumption patterns.

1.7 Structure of Research Report

The first chapter introduces the study with a general introduction, the statement of the problem, the research questions, the set objectives, hypotheses and the justification of the study. The second chapter is on the definition of technical terms and literature review. Chapter three presents the sources and nature of data, and the statistical tools and models used to analyze data in chapter four as well as presentation of the results obtained there from. The summary, recommendations, limitations, and policy implications and conclusion are presented in chapter five. Finally, the bibliography and other vital information are presented in the appendix.

CHAPTER TWO

LITERATURE REVIEW

2.1 Concepts and Issues

- **Agriculture**

It is the science of the cultivation of the soil for crop production and the

raising of livestock (Little, 1997). It has many branches; agricultural economics, crop production, plant health management, animal science, soil science, agricultural engineering, horticulture, agricultural extension service and many others.

It is generally accepted that the history of agriculture began more than 10,000 years ago. But without written records, the evolution of agriculture can only be reconstructed through deductions using logic. These deductions are based on anthropological and archaeological evidences rather than pure scientific facts. Examples of these evidences are artifacts of ancient farming tools and remnants of wild grain.

It is believed that the transformation from hunting-gathering to agriculture occurred gradually after a long period of time. According to Went and the Editors of life (1963), the early development of agriculture may have involved first the management of wild grains and other useful plants by removing adjacent weeds. It is also possible later that a primitive tribe may have discovered a vigorous plant; the seeds were harvested for food, but some were deliberately sown to ensure supply for the next season.

- **Consumption**

It refers to the use of goods and services by households. Neo-classical economists generally consider consumption to be the end point of an economic activity, and thus the level of consumption per person is viewed as a central measure of an economy's productive success. The study of consumer behaviour plays a central role in macro and microeconomics. Macroeconomists are interested in aggregate consumption for two distinct reasons. First aggregate consumption determines aggregate savings because saving is defined as that portion

of income that is not consumed. Because aggregate saving feeds through the financial system to create the national supply of capital, it follows that aggregate consumption and saving behaviour has a powerful influence on an economy's long-term productive capacity. Secondly, since consumption expenditure accounts for most of national output, understanding the dynamics of aggregate consumption expenditure is essential to understanding macro-economic fluctuations and the business cycle.

Micro-economists have studied consumption behaviour for many different reasons, using consumption data to measure poverty, to examine households' preparedness for retirement, or test theories of competition in retail industries. A rich variety of household-level data sources allows economists to examine household spending behaviour in minute detail, and micro-economists have also utilized these data to examine interactions between consumption and other microeconomic behaviour.

- **Food Security**

Food security exists when all people at all times have physical and economic access to safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life (World Food Summit, 1996). The concept of food security includes both physical and economic access to food that meets people's dietary needs as well as their food preferences. According to the World Health Organization (WHO) (2012), food security is built on three pillars which include; Food availability: sufficient quantities of food available on a consistent basis; Food access: having sufficient resources to obtain appropriate foods for a nutritious diet; Food use: appropriate utilization of the available food based on knowledge of basic nutrition and care, as well as adequate

water and sanitation.

- **Household**

The household is composed of individuals, but it is clearly more than that.

We shall consider the household to possess three leading properties;

- The household is a collection of individuals
- It is a small collection of individuals
- It is a closely-knit collection of individuals.

Insofar as the household is a collection of individuals, a theory of the household can draw on general theoretical results for groups such as; aggregation

properties and the properties of social decision rules. Since it is a small collection, we must reject group properties that depend on large numbers and search for properties that depend on smallness of numbers. Since the household is a closely knit group, we can accept some things like interpersonal utility comparisons that we would not over random aggregates, and must be prepared to emphasize others, like joint consumption, that would be peripheral phenomena for large groups.

- **Household Access to Food**

Access refers to the ability for everyone, regardless of disability or special needs, to access, use and benefit from everything within their environment. It is the 'degree to which a product, device, service or environment is available to as many people as possible.

Food accessibility refers to the access by individuals to adequate resources for acquiring appropriate foods for a nutritious diet. It

addresses whether the household or individuals have enough resources to acquire appropriate quantity of quality foods, thus, it encompasses their income, expenditure and buying capacity.

There are two aspects of food access; the economic and physical access. Economic access refers to the factors such as income, poverty and other indicators of buying capacity. Physical access indicators are related to infrastructure and facilities that hasten the access to food.

- **Household Consumption Patterns**

Food consumption patterns can be define as a recognizable ways of eating food, Rural dwellers tend to adhere to their old eating patterns rather than venturing more proper eating habits.

This provides information about the quantities of food items consumed of the survey households. Household food consumption has been defined as the amount of food available for consumption in the household, generally excluding the food taken outside unless prepared at home (Klaver, Knuiman et al. 1982). Research in developing countries show that as income increases, the poorest households spend a major share of their additional expenses.

- **Smoked fish**

Smoked fish is fish that has been cured by smoking. Foods have been smoked by humans throughout history. Originally, this was done as a preservative. In more recent times, fish is readily preserved by refrigeration and freezing, and the smoking of fish is generally done for the unique taste and flavor imparted by the smoking process. The process of smoking fish occurs through the use of fire. Wood contains three major components that are broken down in the burning process to form smoke. The burning process is called pyrolysis, which is simply

defined as the chemical decomposition by heat. The major wood components are; cellulose, hemicelluloses and lignin (Rozum, 2012).

The major steps in the preparation of smoked fish are salting, cold smoking, cooling, packing (air/ vacuum or modified), and storage. Smoking is one of the oldest preservation methods, combines the effects of salting, drying, heating and smoking. Typical smoking of fish is either cold (28-32^{o}C) or hot (70-80^{o}C). Cold smoking does not cook the flesh, coagulate the proteins, inactivate food spoilage enzymes, or eliminate the food pathogens, and hence refrigerates storage is necessary until consumption although dry-cured hams are smoked and require no refrigeration (Alasalvar, Miyashita, Shahidi & Wanasundara, 2011).

A smokehouse is a building where fish or meat is cured with smoke. In a traditional fishing village, a smokehouse is often attached to a fisherman's cottage. The smoked products might be stored in the building, sometimes for a year or more. Traditional smokehouses serve both as smokers and to store the smoked fish. Fish could be preserved if it was cured with salt and cold smoked for two weeks or longer. Smokehouses were often secured to prevent animals and thieves from accessing the food (Rozum, 2012).

Today, there are two main methods of smoking fish: traditional method and the mechanical method. The traditional method involves the fish being suspended in smokehouses over slowly smouldering wood shavings. The fish are left over night to be naturally infused with smoke. In the mechanical method, smoke is generated through the use of smoke condensates, which are created by the industrial process of turning smoke into a solid or liquid form. The flow of smoke in the mechanical kiln is computer controlled and the fish generally spends

less time being smoked than in a traditional kiln. Laminar air-flow technology allows mechanical kilns to achieve a higher production rate, while the use of micro-processors has allowed mechanical kiln smokers increases sensor coverage within the kiln. High-quality smoked fish is a high-end product sought after by restaurants (Rozum, 2012).

2.2: Theoretical Framework

Consumption pattern describes the variation in goods and services consumed. This change can be at a given time or overtime. The motive behind consumption can be described in various ways. The most important is that relating to the nature of the demand that is, direct or otherwise. The decision of an individual on what range of items to consume is largely influenced by his income and the price of the commodity. An increase in the consumer's income or a reduction in the prices of foodstuff will automatically increase the quantity of food consumed by a household and vice-versa, all things being equal.

The effect of increases in income level on the demand for food is based on Engels law which states that the proportion of income spent on food diminishes as income increases. Therefore as incomes increase, the marginal utility of food is less than that of other commodities because consumers would have satisfied their need for food first. A higher income would then mean that better foods would be consumed such as animal proteins, but the increase in the consumption of other commodities would be greater. The consumer has a given income which sets limits to his maximizing behaviour. Income therefore acts as a constraint in the attempt for maximizing utility. The income constraint in the case of two commodities (X and Y) may be expressed as;

$Y = PxQx + PyQy$ …….…….…..…….. (1)

This is referred to as the budget constraint of the consumer. The consumer is in equilibrium when he maximizes his utility, given his income and market prices. Two conditions must be fulfilled for the consumer to be in equilibrium. The first condition is that the marginal rate of substitution be equal to the ratio of commodity prices.

$MRS_{x,y}=MU_x/MU_y=P_x/P_y$

$$\frac{MUx}{MUy} = \frac{Px}{Py} \text{……(2)}$$

Where;

MU_x = Marginal Utility of Commodity X

MU_y = Marginal Utility of Commodity Y

P_x = Price of Commodity X

P_y = Price of Commodity Y

The second condition is that the indifference curve be convex to the origin. This condition is fulfilled by the axiom of diminishing MRSx,y which states that the slope of the indifference curve decreases (in absolute term) as we move along the curve from left downward to the right.

At the point of tangency the slopes of the budget line (Px/Py) and of the indifference curve (MRSx,y = MUx/MUy) are equal that is, MUx/ MUy = Px/Py. The figure below shows the indifference curve and utility maximization;

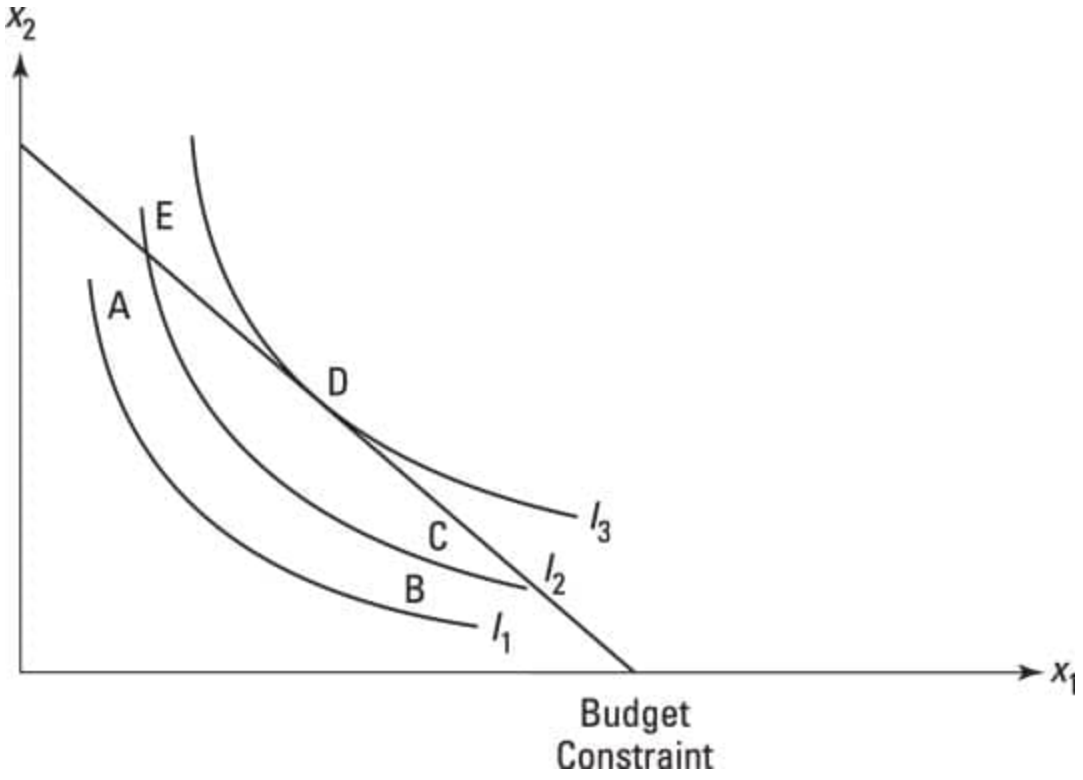


Figure 2.1: Indifference Curve Showing Maximization of Utility

We are all consumers: each of us undertakes many forms of consumer behavior in every day of our lives. Consumer behavior involves more than just how a person buys products or services. In today's world of competitive offerings, diversity of consumer preferences, and proliferation of brands, consumer behavior has become extremely important for marketing decisions.

Consumer behavior emerged as an independent field of research within marketing nearly sixty years ago. In recent years, study of consumer behavior has emerged as a specialty of growing concern to marketing scholars. Knowledge of consumer behavior can provide useful input to marketing strategies like segmentation, target market selection and positioning. In many ways, consumer behavior is a subtle phenomenon. The reasons for their behavior are not always clear. Actions of consumers are impulsive thus sometimes difficult to predict, and

sometimes even hard to explain.

It is believed that consumers make their purchases on the basis of small number of selective chosen pieces of information. Markets resolve every activity around the ultimate consumers and focuses on:

- Who buy the products?

- How do they buy the product?

- Where do they buy them?

- How often do they buy them?

- When do they buy them?

- Why do they buy them?

- How often do they use them?

The decision process helps the marketers to decide the target consumers and also the consumers need satisfying products. The ultimate target and the primary force of all marketers is the consumer. No matter who they are: urban or rural residents, male or female, young or old, rich or poor, educated or uneducated, believer or non-believer. As a consumer, individual encompasses many different behaviors such as collecting, nurturing, cleaning, preparing, displaying, storing, wearing, sharing, evaluating, and serving etc.

An organization’s marketing activity look forward to satisfy consumer needs and wants at a profit. Consumers play an important role in building local, national, and international economic conditions.

Every person has, is and will continue to be a consumer of some product or the other. Because of this, the study of consumer behavior will be of interest not only to marketers but also to economists. An understanding

of consumer behavior will help the economists to shape overall infrastructure of the industry, suitable for the future development. For a layman, the study will help to become a better consumer. Thus, the study will be enabling to grasp a gainful insight into the internal and external factors influencing the consumption related behavior of individuals. To have a wide and clear view of the behavioral aspect, meaning of consumer, customer and buyer are bifurcated and their meaning are as follows:

• Customer - Individual who is the ultimate user of the goods/services and purchases the same from particular organization or shop. A customer is not always a consumer thus; all the buyers or consumers are not buyers.

• Buyer - One who purchases the product is called the buyer. Buyer may not be the ultimate user.

• Consumer - The end user of goods/services is known as consumer. The consumer may or may not be the buyer or customer. Latent purchase behavior is referred here.

As time changes, the consuming entities being used by consumer has been divided into personal consumer and organizational consumer. Personal consumer is the ultimate or the end user of the goods/services. Here the purchase activity is made with little or no influence of others. Organizational consumer purchases the commodity either for profit or for the non-profit activities, which are further used in the production processes. Products purchased by organizational buyer are secondary goods, which are further used for production process; here direct consumption does not take place.

Assael (1992) has discussed the concept of consumer behavior with the

help of a simple model. First and the foremost criterion to start the model is the consumer decision-making process. He studied the consumer decision on purchasing a brand, through evaluating the product information, with the other available alternatives in the market. To come up with the decision making process, three factors influence the same, namely, individual consumer, environmental influences, and applications of consumer behavior to marketing strategies. Thus, the purchase of the product is affected by consumers' needs, attitude towards alternatives, characteristics of the products/services, lifestyle, personality and many more. Besides these, individual factors such as social class, culture, sub-culture also play an effective role. Before influencing the consumer, marketing opportunities should be evaluated by the marketer. This will help to target the exact consumer with the appropriate goods/services.

Once the consumer has made a decision i.e. post-purchase evaluation, consumer response stage is reached. As per the experience, a consumer can change their pattern of consumption and may or may not buy the product. Consumption experience will directly influence whether the consumer will buy the same brand ever again in the future. Thus, marketing research is required at every stage of consumer response, by the marketer and the importance of analyzing consumer behavior can be judged with the same process.

The model of consumer behavior provides a basis for developing marketing strategies beside the information necessary for the same. The only limitation with the consumer behavior model is that the model will vary among individuals in the same market and also that all purchase decisions are not equally complex.

Wilkie (1990) has studied seven basic characteristics of consumer

behavior. They are motivational behavior, activities, process, timing, complexity, roles, influencing factors, and the people. One of the priority keys to study consumer behavior is motivation, as consumer behavior is always requisite. It aims to achieve a particular goal.

Consumer behavior includes many activities. Understanding such activities provides a useful basis for developing marketing strategies and the process can be referred to as selecting, purchasing, and using the product. Timing refers to when the decision takes place and how long the entire process takes. At the same point complexity refers to the number of activities involved in a decision making process. Combination of roles a consumer can play includes influencer, purchaser and the user. Influence is the natural occurrence in the consumer world. It can be external or internal. Culture, sub-culture, lifestyle, and family are some of the universal influencing factors. External influence sources vary with the time duration. Consumer behavior differs from one to another. As a result, market segmentation stands as one of the basic strategy for producers.

As said by Adam Smith (1776), consumption is the final purpose of all the production. The interest of the producer is to promote their goods or services to the consumer. In the present commercial system, the consumption is the ultimate end point and the production relies heavily on it.

Consumer behavior reflects the totality of the decisions i.e. whether, what, why, how, when, where, how much/often/long about the consumption, acquisition, usage and disposition of an offering, product, service, time, and ideas by the decision making units including information gatherer, influencer, decider, purchaser, or user over time i.e. for hours, days, weeks, months, and years (Arnould et al., 2002).

Consumer behavior studies the characteristics of individual consumers such as demographics, psychographics, and behavioral variables. In an attempt to understand the consumer activities, one has to study the people's wants. As consumer behavior has become an integral part of strategic market planning, detail research of the area by marketers is of priority. Next section discusses the important models of consumer behavior, helps in understanding and studying the marketing strategies in trend, in the market environment.

2.3 Empirical Literature

2.3.1 Fish Smoking

Smoking is one of the oldest methods used to process and preserve fish (Bilgin et al., 2008; Hultmanna et al., 2004; Simko, 2002; Stołyhwo & Sikorski, 2005; Swastawati et al., 2000). Smoking can inhibit the formation of toxins in products (University of Florida, 2004), reduce the growth of bacteria, due to lower water activity by smoking in combination with salting and drying which creates a physical surface barrier (Rørvik, 2000; Swastawati et al., 2000). The spoilage and pathogenic micro-flora of smoked products are affected by density of smoke, concentration of active components of the smoke in combination with the salt content, and the time and temperature of smoking (Kolodziejska et al., 2002).

After smoking, the colour and flavour of fish are changed (Visciano et al., 2008). Smoked fish has specific odour, taste and yellow colour (Swastawati et al., 2000). Nowadays, shifting for high sensory quality product is the main purpose of smoking. The smoked products have

higher moisture and lower salt content than in the past (Kolodziejska et al., 2002). The smoking process is characteristically a combination of salting, drying, smoking (Alcicek and Atar, 2010; Bhulyan et al., 1986; Kenneth & Hilderbrand, 1992; Sigurgisladottir et al., 2000) followed by vacuum, modified or controlled atmosphere packaging (University of Florida, 2004).

In the past, smoked fish was typically produced with high salt and low moisture content. Nowadays, producers have adjusted the processing condition to produce lower salt products to fulfill consumer demands. The drying step is therefore carried out before and after smoking to remove the moisture from the flesh to increase the water phase salt (WPS) and strengthen the texture of the final product. Drying is affected by heat, humidity, air velocity, and characteristics of material (Kenneth & Hilderbrand, 1992). Depending on the way smoke gets into products, smoking can be categorized accordingly: the traditional technique – where the smoke is formed directly by burning chips or sawdust from firm wood in the oven (Stołyhwo & Sikorski, 2005; Visciano et al., 2008); or new technique - by using an electric field acts on the ionised smoke particles, which quickens the smoke deposition or by using commercial liquid smoke flavourings (Duffes, 1999; Martinez et al., 2007). Furthermore, smoking can be defined as hot smoking, warm smoking or cold smoking depending on the smoking temperature (Duffes, 1999; University of Florida, 2004; Rørvik, 2000; Stołyhwo & Sikorski, 2005). Cold smoking has only one basic function which is applying smoke to the product while the hot smoking has the function of applying heat and cooks the product (Kenneth & Hilderbrand, 1992). It is therefore not necessary to cook hot smoked fish before consumption because it is a ready-to-eat food.

The quality of smoked fish is affected by raw material (Cardinal et al., 2001; Rora et al., 1998), salting method, brining concentration (Alcicek & Atar, 2010; Goulas & Kontominas, 2005; Sigurgisladottir et al., 2000) condition processing (Duffes, 1999), composition of smoke (Kenneth & Hilderbrand, 1992; Stołyhwo and Sikorski, 2005) smoking method (Cardinal, et al., 2006), smoke agents (Siskos et al., 2007) and storage conditions.

2.3.2 Smoking methods

2.3.2.1 Hot smoking

Hot smoking is known as the traditional smoking method (Arason et al., 2014). The products have high salt and low moisture content. Safe hot smoked fish requires at least 3.5% water phase salt (WPS) and must have achieved an internal product temperature of at least 145 °F (62.8 °C) for at least 30 minutes (Kenneth & Hilderbrand, 1992; University of Florida, 2004). This prevents the production of toxins by Clostridium botulinum (Kenneth & Hilderbrand, 1992). Additionally, water activity (aw) of hot smoked fish products must be less than 0.85 to make products stable at room temperature (Arason et al., 2014).

The hot smoking of fish includes five steps: surface drying, smoking, drying, heating/cooking and cooling. Cooling the fish to lower than cooking temperature is carried out immediately in the smoke house. Then, cooling down to less than 38 °F (3.3 °C) as quickly as possible but not in the smokehouse and keeping products at that temperature to reduce the growth of food poisoning bacteria until consumption (Kenneth and Hilderbrand, 1992). Hot smoking has been applied to different fish species such as: tuna, mackerel, halibut and sardine.

2.3.2.2 Cold smoking

Cold smoking is a smoking method where the temperature is maintained below 95 °F (35 °C) and the final salt content in the product must be at least 3.5% WPS (Kenneth & Hilderbrand, 1992; University of Florida, 2004). Arason et al., (2014) suggests that the relative humidity during cold smoking should be remained in the range of 75–85%. Vacuum packed and chilled storage should be followed by cold smoking because product is not completely preserved (Kenneth & Hilderbrand, 1992; Rørvik, 2000).

2.3.3 Smoke Agents

2.3.3.1 Wood smoke

Wood smoke is produced by smouldering chips or sawdust of firm wood below the fish in the smokehouse (Visciano et al., 2008). The composition of wood has an effect to the taste of the final product. Wood used as a smoke source is hardwood such as: beech, hickory, oak or fruitwood as apple, pear jackfruit, etc.

2.3.3.2 Commercial liquid smoke flavourings

Smoke flavourings have been used for the preservation and aromatization of meat and fish for over 40 years (Hattula et al., 2001). It is made by distilling dry wood which is then concentrated to a specific concentration (Arason et al., 2014). Concentrated smoke can be used directly on products or dissolved in water or oil (Maga, 1988). Polycyclic aromatic hydrocarbons (PAHs), the largest class of chemical compounds known to be cancer causing agents (Simko, 2002), is not present in liquid smoke flavourings thus, it can be evaluated as safe for

health (Alcicek & Atar, 2010). Using liquid smoke has some advantages over traditional smoking techniques such as lowering costs, less environmental damage and greater availability and variety of application methods (Hattula et al., 2001; Maga, 1988).

2.3.4 Fish Consumption Studies

Various studies have been carried out on the pattern of fish consumption by the household, such as the relationship between fish consumption and income level and certain socio-economic factors that influence household consumption expenditure. However, opinions on the composition of the criteria used in these studies differ based on the perspective of the researchers.

Oniye & Adeboye (1986), in their study on consumer preference for fish in Kaduna State observed that fresh fish was most preferred by people of all groups, followed by fried, smoked and dried fish in that order. Income level was found to be a major factor influencing household fish consumption decision.

Adeniyi (1987) in a preliminary analysis carried out on fish consumption in Kwara and Oyo States, found that 60.2% of the consumers interviewed indicated that they preferred fish to any other source of animal protein, while 20.5% had preference for beef. This preference however appeared not to be reflected in the expenditure on fish, for average monthly fish expenditure was 35.53 which was less than that of beef 43.29. The reason for this discrepancy could be found in the low price of beef relative to that of fish, particularly fresh fish.

Other important factors to be considered in fish consumption studies in Nigeria include the various species of fish sold in the Nigerian market and the different forms in which fish can be bought. These forms were

analyzed by Mabawonku et al. (1982) as fresh, smoked, sundried or salted. Thus a consumer in purchasing a particular variety or form .of fish may likely depend not only on relative prices or the prices of substitutes such as meat, but more especially on the distinct characteristics or quality which the consumer attaches to what he buys. From their study, they found that a high proportion of respondents would increase their consumption of cured fish relative to others such as fresh fish and meat. Fresh fish was considered as a substitute in this case.

Fabiyi (1985), in his study on the demand for fish conducted in Calabar, found that both own price elasticities of demand for fresh and frozen fish decreased as the level of per capita income increased, while income elasticity of demand increased as per capita income increased. The calculated per capita consumption was found to be 5.18 kg and 4.31 kg per annum for fresh and frozen fish respectively. The values of own price and income elasticities indicate that more fish will be consumed at every increase in income, if both production and marketing are improved.

Adesimi & Aderinola (1983) in their study on the economic analysis of fish import demand in Nigeria, have shown that Nigerians have a relatively high marginal propensity to consume imported fish and that the volume of fish imports was very responsive to changes in socio-economic factors such as population, national income and domestic fish production.

2.4 Contribution of Current Study

Although a vital body of literature has emerged focusing on fish consumption, little research has been undertaken on the economic analysis of the consumption of smoked fish in Buea Municipality. This

research work shall add to the existing literature. This will be achieved through the study of the determinants of household consumption patterns with respect to smoked fish and the use of socioeconomic data to make policy recommendations to be used by smoked fish consumers as it will go a long way to increase their consumer welfare.

CHAPTER THREE

METHODOLOGY

3.1 Description of Study Area

This study was carried out in Buea the Regional Capital of the South West Region, of the Republic of Cameroon. The town is located on the eastern slopes of Mount Cameroon. Buea is situated at 4.15^{o} North latitude and 9.24^{o} East longitude. It is found around the foot of Mount Cameroon; about 896m above sea level. It covers a surface area of $7000km^2$ and has a population of above 200,000 and population density of 19.78 persons/km^2 (2005 BUCREP figures). It has 67 villages, four distinct identified urban spaces as per outlined criteria (Buea station, Soppo, Molyko/Mile 17 and Muea) it is a highly complex community caught in between a blend of urban, semi urban, rural and traditional settings.

Buea Municipality is bounded to the North by tropical forest on the slope of Mount Cameroon (4100m above sea level). The mountain range extends to the beautiful sandy beaches of the Atlantic Ocean. The town also share boundary with other major towns like the city of Limbe to the South West, Tiko municipality to the South East, Muyuka municipality to the East, and Idenau district to the West. With an equatorial climate, temperatures are moderate with a slight seasonal variation (rainy and dry season). Buea has moderate economy with agricultural, administrative, business, tourism and the financial sectors taking the central stage of the town.

Buea has an estimated population of above 200,000 inhabitants (2005 BUCREP figures and annual growth rate of 5% as per UN projections for urban population growth rate for Africa) constituting essentially of the Bakweris (the indigenes) in the villages and highly cosmopolitan population within the urban space putting the indigenes at a minority. The Bakweri language spoken by the natives is equally written and

documented. English and French are the two official languages used for general interaction while pidgin is the lingua franca. The average life expectancy of this area is 50 years (1999 statistics) literacy rate is on the rise with some 60-75% of the youths having access to education (Buea council, 2014). According to 2004 survey, carried out by the Ministry of Public Health in Cameroon, about 40% of the population do not have access to quality health care while close to 60% have financial difficulties to afford basic healthcare services. This citation is currently true for rural areas of the municipality and much less realistic in the urban zones (Buea council, 2014).

Buea is one of the fastest growing towns in Cameroon today with a mix cosmopolitan setting and a constellation of about 67 villages. These villages are inhabited by the Bakweris who, according to social scientists, have lived around Mount Cameroon for atleast 4,000years (Buea council, 2014). Its urban rims now include; Molyko, Buea station, Muea, GRA, Mile 16, Clerks and Federal quarters, Great Soppo, Small Soppo, Likoko-Membea, Bokwaongo, and Bonduma. Buea is presently the headquarters of the Southwest region of Cameroon. It remains the only one having the Senior Divisional Office, most of its Divisional Sectorials offices and a few regional offices located in another town (Limbe).

Buea municipality has a distinct biophysical environment surrounded by an evergreen tropical ecosystem with high variety of biodiversity including; birds and animal species. Some parts of the mountain slopes have rare species of plants and animal found nowhere else in the world such as the unique Prunus Africana and animal species living only under particular conditions, which can be met here. From vegetation thick forest, secondary forest, shrubs to savanna towards the peak of the mountain (Buea council, 2014). Accessibility to villages in this area is

through the roads. Most of the villages are located on the slopes of the mountain. The biophysical environment has been greatly tempered with and exploited for habitation and settlement, agricultural, forestry and fishing activities, housing and furniture materials through cutting down of trees. Volcanic activity has greatly altered and influenced the biophysical environment. The exploitation of the primary forests have turned them into secondary forests and in some cases farms or habitation in almost all accessible and nearby land in the villages and urban spaces. Theses intensive activities have caused and continue to cause environmental hazards to soils, water sources, climate and biodiversity (Buea council, 2014).

Buea GMT time is +1 hour and is mostly cloudy. Average sunrise is at 06:16 am and sunset at 18:10pm. In effect, it has an equatorial climate with 2 major seasons. Rainy season which runs from March to October and Dry season, from November to May. Temperatures range between 20^{o}C to 28^{o}C while annual rainfall ranges between 3000mm to 5000mm (Buea council, 2014). The conditions here are generally the tropical rainforest climate with rainfall almost during the entire year. However, average monthly high/low temperatures for these urban spaces ranges from 23 ^{o}C low to 32 ^{o}C high. This temperature increases as one moves downwards from Buea station to Muea. Several factors are behind this. Firstly, the principle of the higher one goes, the colder it becomes applies as the town is on the slopes of the mountain. Secondly, some areas have higher population intensity, activity and urbanization than others. Molyko for example has more infrastructure which reduces circulation and exchange of air.

Also the vegetation is evergreen almost throughout the year. Buea council has had several water sources currently more or less exploited

and losing its value if not protected. Some of these sources run dry and are affected by the following human and natural activities; climate change effects and resulting longer dry season, unprotected nature of the water catchment areas, felling of trees and shrubs for native raw materials and fire woods, bush and hunting fires, advancing poor vegetation due to urbanization and human activities, hazards waste disposal, expansion of farms, animal activities and residential areas. However, viable catchments could be found in the following areas with some losing value, potency and almost extinct; Upper farms, Small Soppo, Ewonda, Muea, Bonduma and Molyko, Bulu Blind, Mile 16 and 14 area, German spring, Koke, Bwitingi, and Musole spring (Buea council, 2014).

The main economic activity of its people is agriculture. The cultivation of food crops like; maize, tomato, yams, cocoyam, potatoes, beans, cassava, egusi and vegetables. Cash crops such as; oil palm, banana, plantain, tea, cultivated by CDC (an agro-industry), Tole tea estate and other smallholder farmers and out-growers. Farming in this area is still very primitive that is, labour intensive with little or no use of machines. But in all, agriculture in Buea is a success due to the fertility of the soil and favourable climatic conditions for the cultivation of both food and cash crops

The soils are very rich in nutrients favouring the growth of plankton which are natural food for fish and together with the climate, favour the creation of fish ponds. The species grown in Buea are; the Nile tilapia (Oreochromis niloticus), Catfish (Clarias gariepinus), Common carp (Cyprinus carpio), African bonytongue (Heterotis niloticus), etc. Fish smoking in Buea is traditionally carried out by women in coastal towns and villages, along river banks and shores of lakes. In most fishing

communities, the main economic activity of women is fish processing. Depending on the type of fish to be smoked, it uses possible storage period, the smoking process can take the form of “wet-hot smoking or dry-hot smoking. Both processes are carried out temperatures above 80^{o}C, which are high enough to cook the fish (Buea council, 2014).

Buea Municipality, which is the focus of this study, has in recent years been characterized by an increasing population that depends on various species of fish; smoked, frozen or fresh. The demand for fish in the Buea municipality has been on the increase with daily influxes of various species into the markets in Buea. The high demand for fish has resulted in a growth of a fish market that attracks largely women as retailers and/ or wholesalers thereby improving the marketing channels of smoked fish for consumption by the Buea populace. Smoked fish is consumed by many inhabitants in Buea especially in dishes such as; banga soup, eru, ekwang, toxi banana, and the fish species smoked are mainly; morocco, bar fish, catfish, djanga, etc.

Bakweri ethnic groups are the majority in the indigenous villages whereas the urban spaces and large villages are a cosmopolitan blend of more than 100 local and national ethnies. Important foreign population especially the Igbos from Nigeria could be found scattered in lucrative commercial activities. The town is equally host to one of the Nigerian Consulates. Dominant languages include; English, French, Pidgin, and Mokpe (Bakweri native language). In a whole, 5 large regional - cultural divisions could be found within the Municipality: Western highlanders (semi-bantu or grass fielders population); coastal tropical forest peoples, including the South west and Littoral regions; Southern tropical forest peoples, from the Centre, Southand East regions; Islamic people of the Noethern semi-arid regions(the Sahel) and central

highlands, including the Fulani and the Kirdi, non-Islamicor recently Islamic peoples of the Northern desert and central highlands. Foriegn migrant population from other countries including; Nigeria, Equatorial Guinea, Tchad, Garbon etc.

The Buea Municipality has a plethora of religious groups. A majority of them are Christians of different denominations like; Catholics, Presbyterians, Baptists, Full Gospel Mission, the Apostolic, 7 Day Adventist, and Jehovah witnesses, etc. There exist growing trends of Christian spiritual or charismatic churches with particular influx from Nigeria. However, a few indigenous populations still maintain their traditional African religions, jujus, and beliefs. Some combine and exchange intermittently. The Muslim population is also growing especially in the urban spaces. The order of importance is as follows: Catholics, Presbyterians, Baptist, Charismatic Christians, other Protestant Christians, Animist and Traditional African religions and Muslim& Islamic faithful. Below is the map of Buea Municipality depicting the various villages;

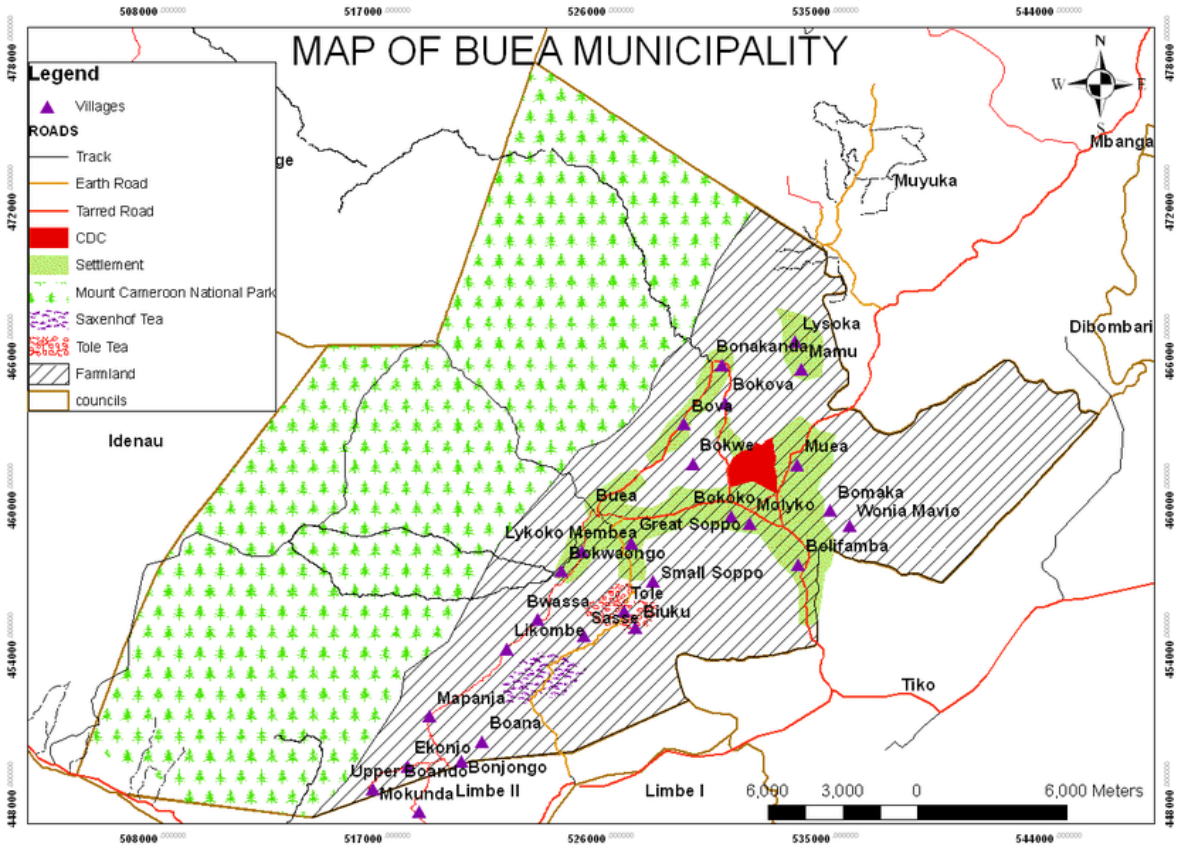


Figure 3.1: Map of Buea (Source: Buea Council)

3.2 Conceptual Framework

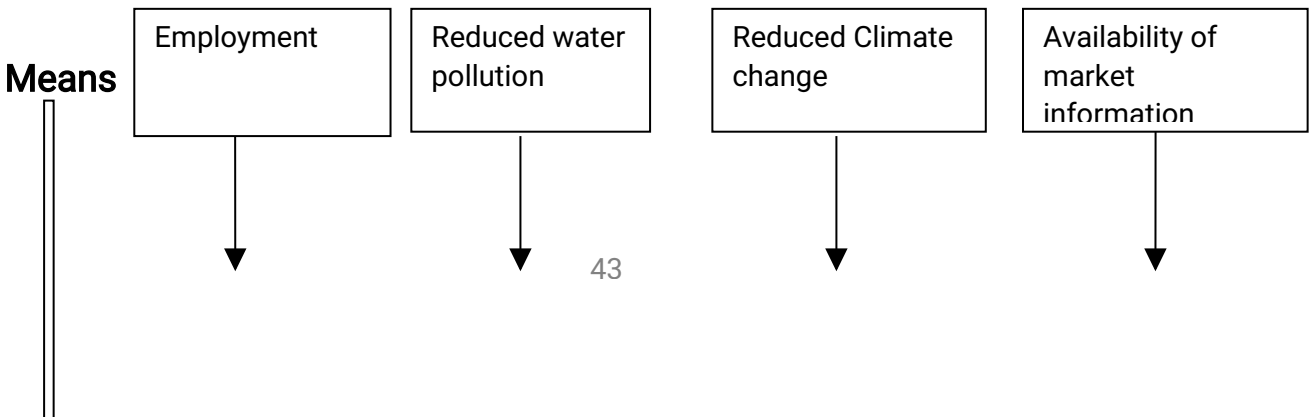
The domestic fish production is derived from artisanal inland waters, artisanal and coastal waters, industrial fishing in inshore and offshore waters and aquaculture. The artisanal subsector covers the operation of small scale canoe fishermen operating in the coastal areas, creeks, lagoons, inshore waters and inland rivers.

The inability of the domestic fish production to meet the domestic demand for smoked fish has led to the importation of fish as well as encouragement of local production using fish ponds, despite the drain on the economy, however, with importation and the use of fish ponds to raise fish, there is a steady supply of smoked fish supply to meet local consumption.

The need for protein in human diet continues to increase as the Buea

population grows. Proteins for human consumption come from two main sources namely plants and animals. Plant proteins have been found to be deficient in certain amino acids (methionine, tryptophan and lysine) which are necessary for healthy growth. Animal proteins on the other hand are rich in these amino acids and are described as first class or good quality proteins. Proteins obtained from livestock population are limited by several factors including scarcity and high cost of feeds, diseases and low genetic potentials of indigenous breeds, which have caused them to be expansive.

Increased employment, reduced water pollution, decrease deforestation, reduced climate change as well as availability of market information will lead to increase smoked fish consumption. This is because, increase employment increases income level, while reduced water pollution leads to increase fish growth, availability of market information will create more efficient market channel. Increase smoked fish consumption will in turn lead to nutrition security, moderate smoked fish prices, decrease consumption of smoked fish substitutes, increase revenue to fish sellers, consumer welfare and hence, increase living standards of the population of Buea Municipality. This can be viewed on the figure below;



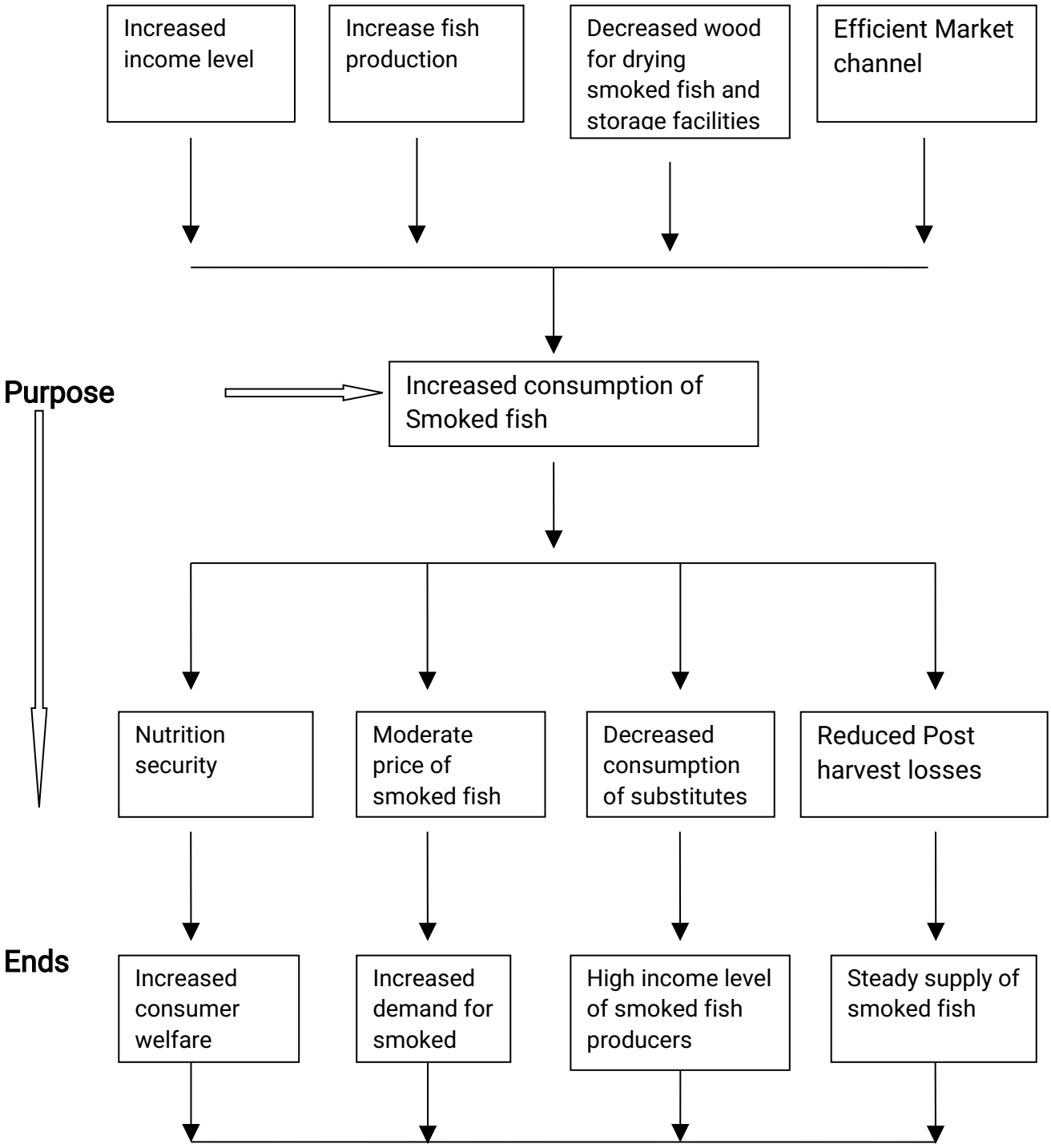


Figure 3.2: Means and Ends diagram of smoked fish consumption (Source: Author's conceptualization, 2019).

3.3 Empirical Model

3.3.1 Mathematical Model

The choice of an appropriate econometric method is usually dependent on the type of dependent variable. Our dependent variable is continuous and varies separately for all consumers of smoked fish. Thus, we employ the conventional Ordinary Least Squares (OLS) technique to model the implications of household living standards on smoked fish consumption patterns in the Buea municipality. We specify the model implicitly as;

$$Y_i = f(x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8, x_9, x_{10}, x_{11}) \quad \text{.....(3)}$$

Where Y_i = total monthly expenditure on smoked fish of the i^{th} consuming household, β_0, β_1, β_2, β_3, β_4, β_5, β_6, β_7, β_8, and β_9 are parameters to be estimated, x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8 and x_9 are the determinants of smoked fish consumption (total household disposable income, price of smoked fish, household size, age of household head, gender of household head, occupation of household head, educational level of household head, household monthly expenditure on substitutes, taste/ preference, ethnicity, and religion). Assuming the relationship is linear, it may be expressed as;

$$Y_i = \beta_0 + \beta_1 \ln x_1 + \beta_2 \ln x_2 + \beta_3 \ln x_3 + \beta_4 \ln x_4 + \beta_5 \ln x_5 + \beta_6 \ln x_6 + \beta_7 \ln x_7 + \beta_8 \ln x_8 + \beta_9 \ln x_9 + \beta_{10} \ln x_{10} + \beta_{11} \ln x_{11} + e$$

.....(4)

Where “e” is error term which accounts for the unexplained variations in total monthly expenditure of smoked fish.

3.3.2 Description of Variables

Y_i = total monthly expenditure on smoked fish of the i^{th} consuming household measured in FCFA

x_1 = total household disposable income measured in FCFA

x_2 = price of smoked fish measured in FCFA

gender measured as 1 if male and 0 if female

x_3 = household size (number of people living and feeding together)

x_4 = age of household head measured by the total number of years lived

x_5 = gender of household head (0 if female and 1 if male)

x_6 = occupation of household head (1 if involved in fish farming and 0 if not involved in fish farming)

x_7 = educational level (measured in years of schooling)

x_8 = Price of substitutes (measured in FCFA)

x_9 = household taste measured by ranking their preferences (measured 1, 2, 3, 4, 5).

x_{10} = ethnicity (measured using dummy variables that is, 1 if Bakwerian and 0 if non Bakwerian)

x_{11} = religion (measured using dummy variables that is, 1 if Christian and 0 if non Christian).

3.3.3 A priori Expectations

This study expects to reveal that;

a.) The higher the disposable income, the higher the total monthly expenditure on smoked fish and hence increased consumption.

b.) The higher the price of smoked fish, the lesser the total monthly expenditure on smoked fish.

c.) The larger the household size, the higher the total monthly expenditure on smoked fish.

d.) The older the household head, the higher the total monthly expenditure on smoked fish.

e.) Female in the households are expected to have higher total monthly expenditure on smoked fish.

f.) Households whose head work off-farm have higher the total monthly expenditure on smoked fish.

g.) The more educated the household head, the higher the total monthly expenditure on smoked fish.

h.) The higher the price of substitutes, the higher the total monthly expenditure on smoked fish.

i.) If the household head prefers smoke fish over meat and chicken as a source of protein, then it is expected that the total monthly expenditure on smoked fish will increase.

j.) It is expected that households which are Bakwerian will consume more smoked fish than non Bakwerian households.

k.) Main stream Christian households are expected to consume more smoked fish than protestant Christians as well as non-Christian households.

3.4 Nature and Source of Data

3.4.1 Type of Data

Principally, this research used primary data. The primary data was obtained through the use of self administered questionnaire and field observations from smoked fish consumers in Buea municipality on the determinants as well as consumption patterns. The idea of these questionnaires was to get first hand information and opinions from farm households.

3.4.2 Sampling Framework

This study targets households involved in smoked fish consumption in the Buea Municipality. Men, women, and youths are included in the sample frame. The method used was the simple random sampling technique in the selection of respondents (since this technique gives equal opportunities for every member of the population to be part of the sample). More especially, since one cannot study everything, everyone and everywhere samples need to be drawn (Huberman et al., 1994).

3.4.3 Sampling Size

Seven (7) consuming households from 10 different localities in Buea were selected using a simple random technique, making a total of 70 respondents for the study. In each household, the household head is selected for study.

This research work targeted respondents in the Buea Municipality with age range from 26 to 65 years. A sample size of 70 households was drawn as seen in the calculations below. The sample size is derived as follows;

When the population of the farming households is not known and simple random sampling is applied, the sample size (n) can be calculated as;

$$n = \frac{Z^2P(q)}{d^2} \quad \text{.....} \quad (5)$$

Where, d is absolute precision, P is expected proportion, n is calculated sample size, q = 1-P, Z = $Z_{\alpha/2}$ = level of significance at a given confidence level. Assuming a 95% confidence interval, d = 0.05 which is 0.1 (1dp) and $Z_{\alpha/2}$ = 1.96.

Since the population of consuming households in Buea Municipality is not known due to poor statistical record, a population proportion p of ¾ of the population of the smoked fish consumers, where total population is 1.

From p + q = 1.....(6)

Given that p = ¾ implies;

q = 1-p .....(7)

= 1 – ¾ = ¼

The sample size can then be calculated as;

$$n = \frac{Z^2P(q)}{d^2}$$

$$= \frac{(1.96)^2(¾)\ (¼)}{(0.1)2}$$

= = 72.03 farmers

In this study, 70 households were interviewed from 10 different villages. This can be seen below:

Table 3.1: Location and sample size

Location	Frequency	Percentage (%)
Wonganga	7	10
Bokwaongo	7	10
Tole	7	10
Likoko	7	10
Bwitingi	7	10
Bokwai	7	10

Bokova	7	10
Muea	7	10
Lysoka	7	10
Molyko	7	10
Total	70	100

Source: Field Survey, 2019

3.4.4 Research Instrument

This study uses mainly a primary source in obtaining information necessary for analysis. The research instrument used was a structured questionnaire which had both closed and open-ended questions relevant to socioeconomic factors including; total monthly expenditure on smoked fish consumption, total household disposable income, price of smoked fish, household size, age of household head, gender of household head, occupation of household head, educational level of household head, household monthly expenditure on substitutes, taste/ preference, so that the respondents could express their own opinion on the topic under investigation. The face-to-face interviews were administered in English, and local interpreters were used where necessary to obtain information with the use of local dialects.

The questionnaire was divided into 2 sections. Section A; contains the biographic profile of the household, section B; Household living standards comprising of; income generation and expenditure and consumption pattern.

In order to avoid losing information, the researcher used a pen, notebook, paper, pencil, and camera for recording the data collected from the farming households.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Data Presentation

4.1.1 Occupation

The survey reveals that, 58.3% are full time farmers and 41.7% are part time farmers out of the 60 farming households interviewed from 10 different villages in Buea. These results are presented in the table below;

Table 4.1: Farmers' occupation

Farmers	Frequency	Percentage (%)
Full time	35	58.3
Part time	25	41.7

Total	**60**	**100**

(Source: Field Survey, 2019)

4.1.2 Age Distribution

The age range examination reveals that 38.3% were in the range of 51years and above, 26.7% within the range of 41-50 years, 20.0% in the range 31-40 years and 15% in the range of 20-30 years. These results are presented below;

Table 4.2: Age Distribution of Farmers

Ages ranges	Frequency	Percentage (%)
20-30	9	15
31-40	12	20
41-50	16	26.7
51+	23	38.3
Total	**60**	**100**

(Source: Field Survey, 2019)

4.1.3 Marital Status

The survey reveals that 20% of farmers are single, about 60% are married while 5% are divorced. This shows that there are more married farmer household heads and about 15% of the farmers are widows (ers). This is illustrrated in the figure below;

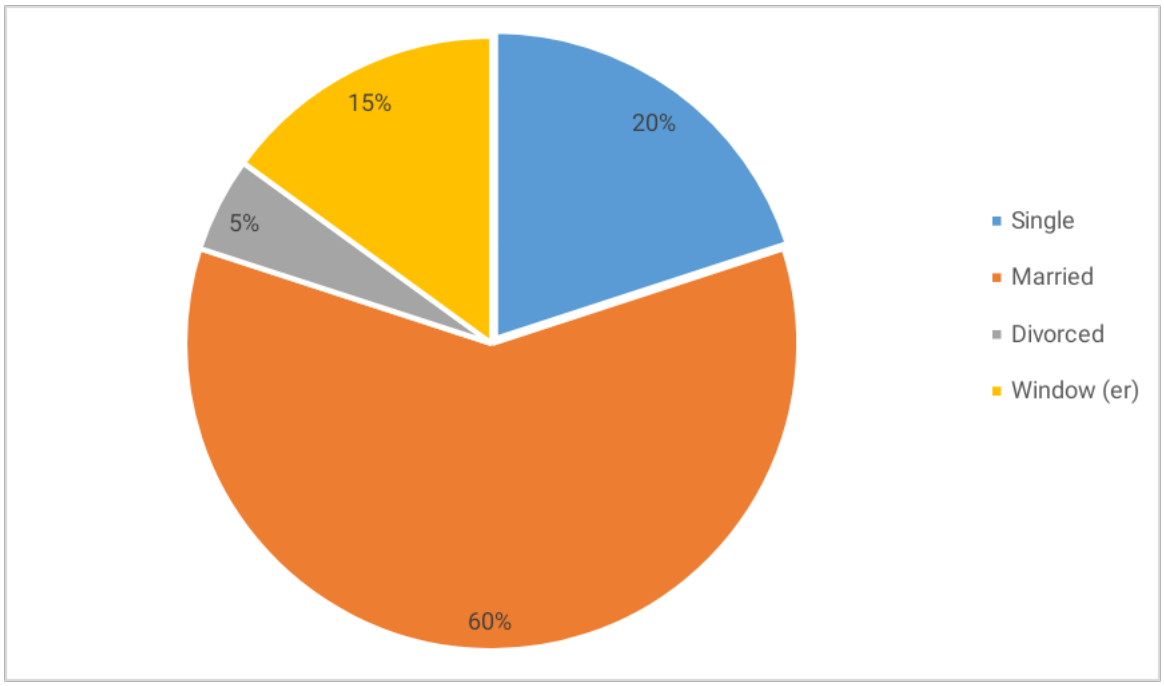


Figure 4.1: Marital Status (Source: Field Survey, 2019)

4.1.4 Gender Distribution

The research shows that 67.1% of the farmers are females while 32.9% are males, showing that there are more females involved in farming than males as seen in the table below:

Table 4.3: Gender Distribution

Gender distribution	Frequency	Percentage (%)
Males	23	38.3
Females	37	61.7

Total	**60**	**100**

(Source: Field Survey, 2019)

4.1.5 Other Income Generating Activities

It shows that 56.7% of the farmers don't have other income generation activities while 43.3% have, as seen below;

Table 4.4: Other income generating activities of farmers

Other Income Activities	Frequency	Percentage (%)
Have	26	43.3
Don't have	34	56.7
Total	**60**	**100**

(Source: Field Survey, 2019)

4.1.6 Household Composition

This research work reveals that 27.1% of the farmers' household composes of 1-5 persons, 64.3 % are 6-9 persons and 8.6% are 10 and above persons. This results are depicted in the figure below;

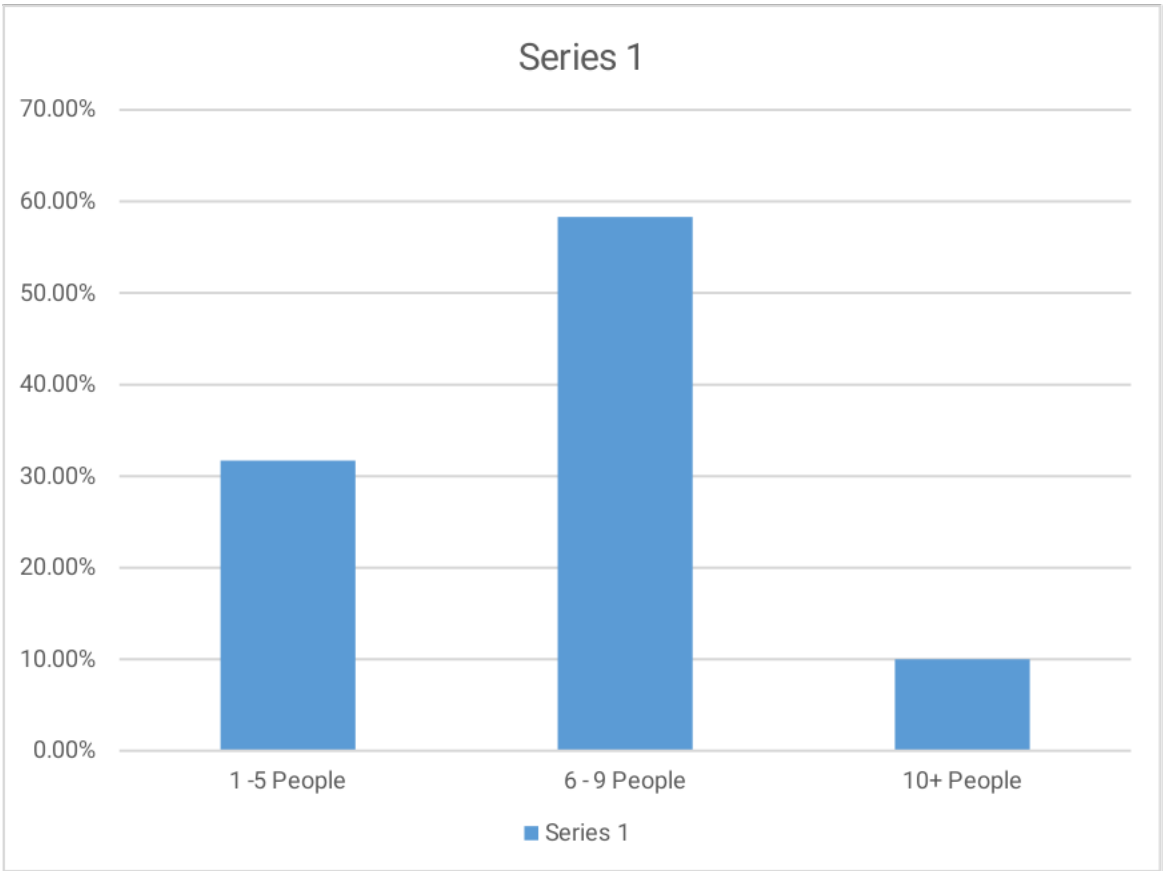


Figure 4.2: Household composition (Source: Field survey, 2019)

4.1.7 Educational Level

The level of education of household head is shown on the figure below. This reveals that 17.1% of the farmers have no formal education, 41.4% are primary school leavers, 22.9% are secondary school leavers and 18.6% are University/higher education leavers. This is illustrated in the figure low;

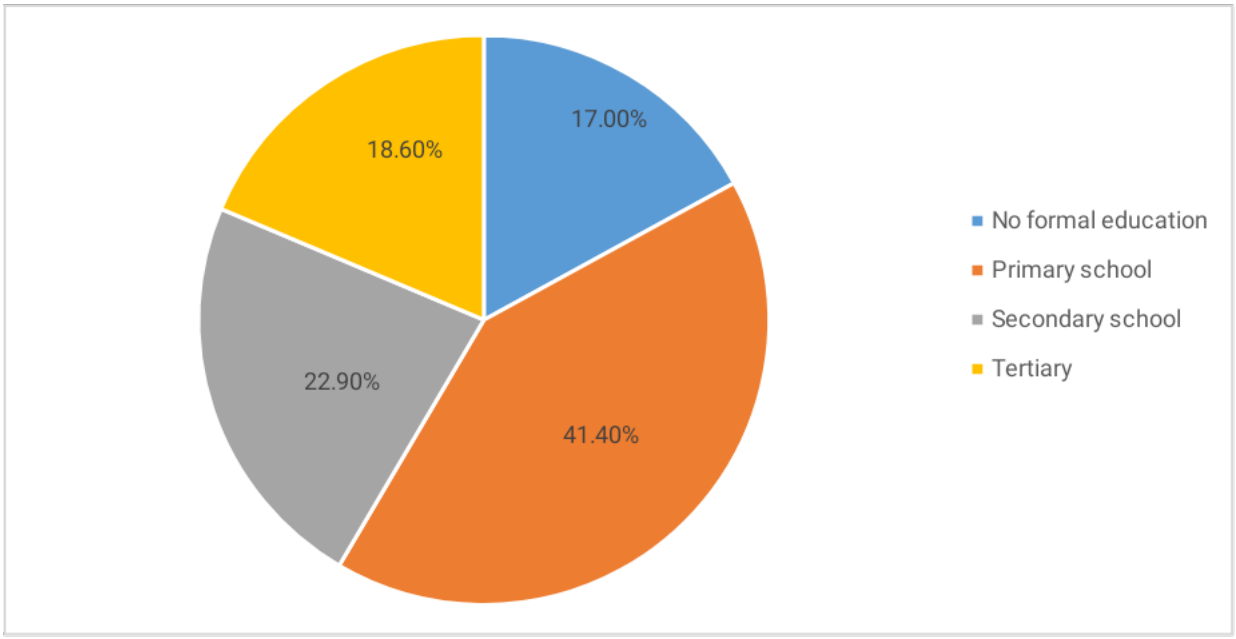


Figure 4.3 : level of education of household head (Source: Field Survey, 2019)

4.1.8 Farmer courses attended

This reseach also reveals that 41.7% of the household heads have attended some farmer courses and 58.3% have not attended farmer courses. The farmer courses were attended in; cooperatives, Regional Delegation of Agriculture and Rural Development, Farmer field School Yoke ,SOWEDA, IRAD Ekona. The table below shows how many farmers have attended any farmer course as seen in the table below;

Table 4.5: Agricultural Courses

Components	Frequency	Percentage (%)
Number Attended	25	41.7
Number not Attended	35	58.3

Total	**60**	**100**

(Source: Field Survey, 2019)

4.1.9 Main Source of Protein

About 31.7% of the household heads said heir main source of proteins is fish, while 35% said chicken, meanwhile 20% choose chicken and the least 13.3% responded mushroom. This can be represented in the table below:

Table 4.6: Main Source of Protein

Respond	Frequency	Percentage (%)
Fish	19	31.7
Meat	21	35
Chicken	12	20
Mushroom	8	13.3
Total	**60**	**100**

(Source: Field Survey, 2019)

4.1.10 Type of weekly meals

This study reveals, 15% of the household heads eat ekwang weekly while 31.7% of them eat eru weekly. An overwhelming majority of about 41.7% eat banga soup weekly wince it is their traditional dish. Meanwhile 11.6% of the respondents feed on other meals weekly. The results are presented in the table below;

Table 4.7 Type of weekly meals

Respond	Frequency	Percentage (%)
Ekwang	9	15
Eru	19	31.7
Banga soup	25	41.7
Others	7	11.6
Total	**60**	**100**

(Source: Field Survey, 2019)

4.1.11 Ethnic group

This research examined that, about 70% of the are Bakwerians by ethnicity while 30% are Non- Bakwerians. This is presented in the below;

Table 4.8 Ethnic group

Sources	Frequency	Percentage (%)
Bakwerians	42	70
Non- Bakwerians	18	30
Total	**60**	**100**

(Sources: field Survey, 2019)

4.1.12 Household access to food and consumption pattern

All the farmers responded they have access to food. Among them, 13% said they eat once a day, 27% said they eat twice a day, 48% responded thrice a day and about 7% said they eat more than three times in a day. This is illustrated in the figure below;

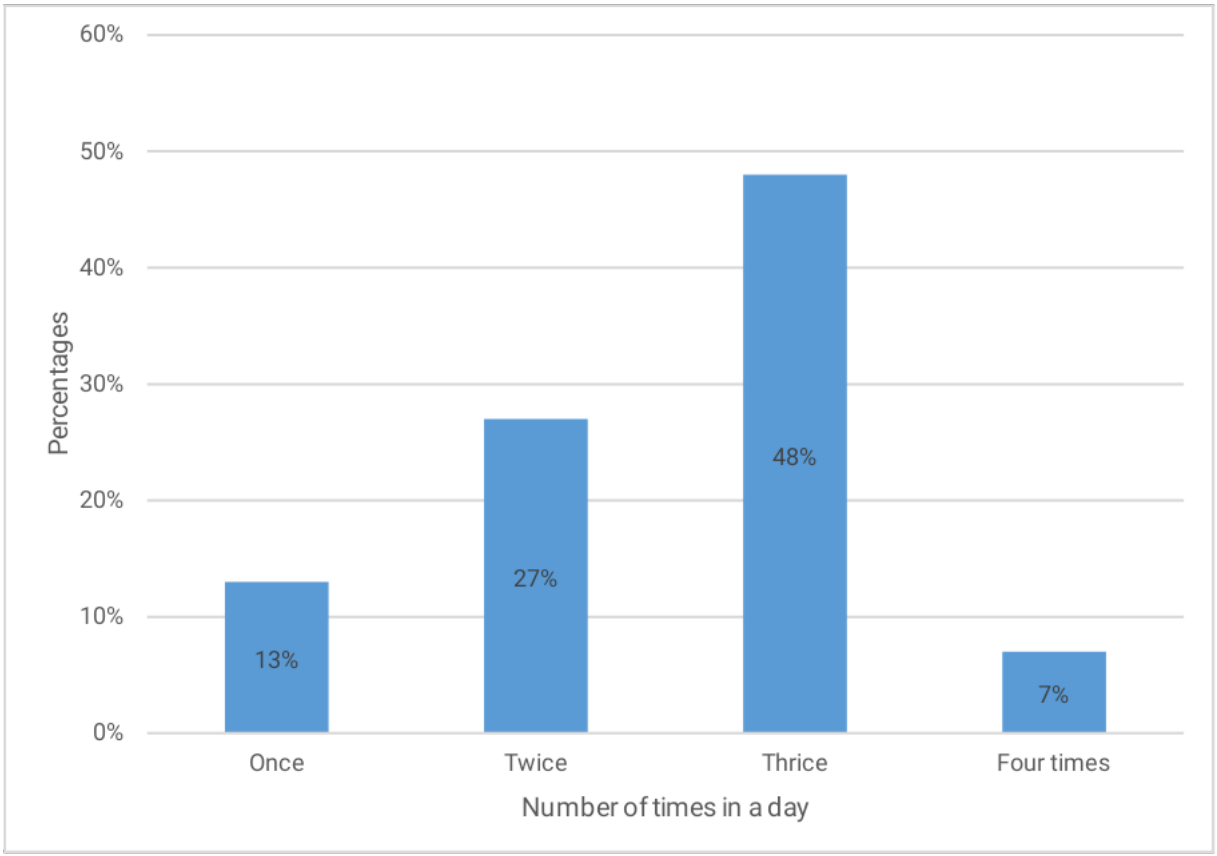


Figure 4.5: Household access to food and consumption pattern (Source: Field Survey, 2019)

4.1.13 Extension Services

This analysis reveals that, 38.3% of the farmers interviewed get advice from extension agents while 61.7% of them do not receive from extension agents. From the farmers who get advice from extension agents (38.3%), 78.3% get advice 1 time a year, 21.7% get it 2 times a

year. This can be seen on table **below;**

Table 4.9 Access to Extension services by household heads

Sex distribution	**Frequency**	**Percentage (%)**
Yes	23	38.3
No	37	61.7
Total	**60**	**100**

(Source: field survey, 2019)

4.2 Econometric Estimation of smoked fish consumption in Buea Municipality

In estimating smoked fish consumption in Buea Municipality, the Ordinary Least Square technique was employed. The results obtained are presented in table below;

Table 4.10: Multiple Linear Regression Analysis

The results of the regression analyses are presented below;

Variables	**Coefficients (B)**	**Other variables**	**Significance level**	**Decision**
Constant	-2.328		0.239	Fail to Reject
Total household disposable income	0.081		0.034	Reject

Price of smoked fish	-0.456		0.050	Reject
Household size	0.646		0.000	Reject
Age of household head	0.532		0.020	Reject
Gender of household head	-0.405		0.076	Fail to Reject
Occupation of household head	-0.229		0.764	Fail to Reject
Educational level of household head	0.034		0.095	Fail to Reject
Price of substitutes	1.542		0.061	Fail to reject
Taste/ preference	0.427		0.015	Reject
Adjusted R^2		(0.617) 61.7%		
F-Stats		60.600		

DW		1.702		
N		60		
df		51		

(Source; Analysis by author, 2019)

$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8 + \beta_9 x_9 + e$

$Y = -2.328 + 0.081x_1 - 0.456x_2 + 0.646x_3 + 0.532\ x_4 - 0.405x_5 - 0.229x_6 + 0.034x_7$

Sig. (0.239) (0.034) (0.050) (0.000) (0.020) (0.617) (0.764) (0.095)

$+ 1.542x_8 + 0.427x_9$

(0.061) (0.015)

Adjusted R^2 = (0.617) 61.7%

4.3 Interpretation and Discussion of Results

4.3.1 Interpretation and discussion of coefficients

The objective is to carry out an Economic analysis of Consumption of Smoked Fish in Buea Municipality, South West Region, Cameroon. The results show the following:

The estimated coefficient for the intercept is the magnitude of the consumption given that the explanatory variables are held constant. In other words, the coefficient of total monthly expenditure on smoked fish when total household disposable income, price of smoked fish, household size, age of household head, gender of household head, occupation of household head, educational level of household head,

household monthly expenditure on substitutes, taste/ preferences are held constant, is -2.323. This goes against the Keynesian consumption function which states there is a positive autonomous consumption even if the consumer doesn't earn any income.

We can now say that the coefficient for income level is 0.081. This depicts a positive relationship between total household disposable income and the total monthly expenditure on smoked fish. So we can say for an increase in disposable income by 1francs, we expect total monthly expenditure on smoked fish to be at 8.1%. This can be attributed to the fact that, increase in disposable income will give the household the liberty to increase their marginal propensity to consume smoked fish by 8.1%. This is in line with the Keynesian consumption theory which states as the disposable income of a household increases, the marginal propensity to consume also increases but its less than one.

For price of smoked fish, the coefficient is -0.456, implying for an increase in the price of smoked fish by 1franc, the total monthly expenditure on smoked fish is expected to drop by 0.456. This shows an inverse relationship between the price of smoked fish and the total monthly expenditure on smoked fish. Therefore, we say for an increase in the price of smoked fish by 1%, we expect total monthly expenditure on smoked fish to reduce by 45.6%. This is because, price of smoked fish is a major determinant of smoked fish consumption. So, any further increase in the prices of smoked fish will negatively affect the household's consumption of smoked fish.

The coefficient for household size is 0.646 this shows a positive relationship between household size and total monthly expenditure on smoked fish. Meaning that an increase in the household size by 1 person,

the total monthly expenditure on smoked fish will also increase by 0.646 frs. This is evident especially in due to the fact that larger households, will tend to consume more smoked fish than smaller households. This could be attributed to the fact that, the increase in household size may increase the diversification of meals containing smoked fish.

The coefficient of age household head is positive 0.532 which shows a direct relationship between age household, and total monthly expenditure on smoked fish implying an increase in the age of the household head by 1 year, the total monthly expenditure on smoked fish will also increase by 53.2% and this ties with our a priori expectations. This 53.2% of increase in the age in household head does not depend on the value that age is held at. This could be attributed to the fact that, the increase in the age of household head may trigger dietary healthy tips which encourage consumption of fish rather than meat so as to avoid gout.

The coefficient of gender of household head is negative that is, -0.405. This means a negative relationship with total monthly expenditure on smoked fish. In addition, we say male headed household heads will have more total monthly expenditure on smoked fish and hence, more consumption of smoked fish than female headed households. This ties with our a priori and it can be tied to the fact that most households depend on the male for food allowance.

The coefficient for the occupation of household head is -0.229 showing a negative relationship with total monthly expenditure on smoked fish. This means for households that are full time farmers are less likely to consume more smoked fish since most rural household practice subsistence farming. On the other hand part time farming households

are more likely to allocated more resources for the purchase of smoked fish. This therefore reveals that, a switch by household head from part time to full time farming, the coefficient of the total monthly expenditure on smoked fish will drop by 22.9%.

The coefficient of quantity of educational level is 0.034 which depicts a positive relationship with total monthly expenditure on smoked fish. The more educated the household head is, the more allocations will be made for consumption of smoked fish. In other words, for an increase in the number of years spent in formal schooling, the expected increase in the total monthly expenditure on smoked fish will be 0.034. This is because, an increase in the years of formal schooling, the more educated will the household head be and hence be aware of the dietary importance of smoked fish.

The coefficient of the price of substitutes is 1.542. This shows there is a positive relationship between price of substitutes and the total monthly expenditure on smoked fish. So we can say as the price of substitutes increase by 1 franc, the total monthly expenditure on smoked fish will also increase by 154.2%. this is in line with our a priori expectation as well as economic theory of demand and supply. As prices of other protein sources increase, there will be more demand for fish and hence the total monthly expenditure on smoked fish will increase implying more consumption.

The value for taste and preference is 0.427 which indicates a direct relationship with the total monthly expenditure on smoked fish. More specifically, an increase in the preference of smoked fish by the household head by 1 unit will lead to 42.7% increase in the total monthly expenditure on smoked fish. This aligns with our a priori expectations

and the theory of demand and supply. This is because, taste and preference are important factors influencing the consumption of smoked fish.

4.3.2 Interpretation of t-values

Decision Rule;

The significance level was obtained using the 95% confidence interval and at 5% level of significance. Following the decision rule in this multiple linear regression, when calculated significance level is less than 0.05, we reject the null hypothesis implying the results are significant and when significance level is greater than 0.05, we fail to reject the null hypothesis showing that our results are not significant. The t-tests are as follows;

For the constant variable we fail to reject the null hypothesis since the calculated significance level is greater than 0.05 (0.239 > 0.05). For household's disposable income, we reject the null hypothesis since the p -value is less than 0.05 (that is, 0.034 < 0.05) stating that household's disposable income is a significant determinant of total monthly expenditure on smoked fish consumption. We reject the null hypothesis for price of smoked fish since the calculated significance level is equal to 0.05 (that is, 0.05 = 0.05) implying the results are significant at 5% and that price of smoked fish is an important factor influencing total monthly expenditure on smoked fish consumption. Also, we reject the null hypothesis for household size since the calculated significance level is less than 0.05 (that is, 0.000 < 0.05) stating that household size is a significant determinant of total monthly expenditure on smoked fish consumption. We reject the null hypothesis for age of household head since the calculated significance level is less than 0.05 (that is, 0.020 <

0.05) implying that age of household head is an important factor influencing total monthly expenditure on smoked fish consumption. We also reject the null hypothesis for taste and preference since the p-value is less than the critical value at 5% significance level (that is, 0.015 < 0.05).

For level of gender of household, we fail to reject the null hypothesis since the calculated significance level is greater than 0.05 (that is, 0.076 > 0.05) implying that gender of household head is a slightly insignificant determinant of total monthly expenditure on smoked fish consumption. We fail to reject the null hypothesis for occupation of household head since the calculated significance level is greater than 0.05 (that is, 0.764 > 0.05) implying the results are not significant at 5% and occupation of household head is not a significant factor influencing total monthly expenditure on smoked fish consumption. In addition, we fail to reject the null hypothesis for educational level of household head since the calculated significance level is greater than 0.05 (that is, 0.095 > 0.05) stating that educational level is not a significant determinant of total monthly expenditure on smoked fish consumption. Since the calculated significance level for price of substitute is greater than 0.05 (that is, 0.061 > 0.05), we therefore fail to reject the null hypothesis and hence the price of substitutes is a non-significant determinant of total household's monthly expenditure on smoked fish.

4.3.3 Interpretation of F-statistics, Durbin Watson value, and Adjusted R^2

For the F- statistics, since the F-calculated is 60.6 which is greater than F -table which is 2.19, this means our overall results are significant at 5%, we therefore reject the null hypothesis and our result is more than 95%

reliable based on the F-ratio and it can be used for policy implementation.

The Durbin Watson (DW) value is 1.702 reading its value from the Durbin -Watson table given k = 9 and n = 60 which falls in the region of no autocorrelation therefore, our estimated parameters are very reliable and our model can be used for forecasting.

The line of best fit is considered as the regression line which is designed to explain the extent to which the independent variables explain the behaviour of the dependent variable and this is reported by the regression coefficient in this case known as adjusted R^2. Therefore, the R^2 is 0.617 showing that the regression line accounts for more than 61.7% variation in total household's monthly expenditure on smoked fish which is due to changes in the explanatory variables. That is, the independent variables (total household disposable income, price of smoked fish, household size, age of household head, gender of household head, occupation of household head, educational level of household head, price of substitutes, taste/ preference) jointly predict more than 61.7% of the changes in total household's monthly expenditure on smoked fish with 38.3% accountable for by the stochastic error term. Since regression coefficient is greater than 50%, therefore, the model fit the equation very well.

CHAPTER FIVE

SUMMARY, RECOMMENDATIONS AND CONCLUSION

5.1 SUMMARY

The main goal of this research is to carry out an economic analysis of Smoked Fish Consumption in the Buea Municipality. This research makes use of primary data on total household disposable income, price of smoked fish, household size, age of household head, gender of household head, occupation of household head, educational level of household head, price of substitutes, taste/ preference as well as total monthly expenditure on smoked fish consumption. The multiple linear regression model was specified for the above variables and analyzed using STATA version 12. The econometric estimation reveals that, household's disposable income, price of smoked fish, household size, age of household head, and taste and preference are significant determinants of total monthly expenditure on smoked fish consumption. Furthermore, the results show that 61.7% of the variation of total monthly expenditure on smoked fish consumption is determined by the explanatory variables analyzed (total household disposable income, price of smoked fish, household size, age of household head, gender of household head, occupation of household head, educational level of household head, price of substitutes, taste/ preference). This study therefore recommends minimum wage of households should be increased so as to increase households' marginal propensity to consume smoked fish. Conclusively, the consumption of smoked fish in Buea Municipality is a function of disposable income, price of smoked fish, household size, age of household head, and taste and preference.

5.2 RECOMMENDATIONS

Based on the research findings, the following recommendations are made:

a) Government should increase minimum wage of workers increased so as to increase households' marginal propensity to consume smoked fish.

b) There should be provision of food stamps especially to the age people so as to increase their protein intake and other dietary needs.

c) The government should set floor and ceiling prices so as to stabilize smoked fish prices and hence a positive multiplier effect on the consumers.

5.3 LIMITATIONS OF STUDY AND AREAS FOR FURTHER RESEARCH

This study was limited to carrying out an economic analysis of Smoked Fish Consumption in the Buea Municipality, and thus propose that another study should be carried out on the smoked fish consumption in other regions in Cameroon.

Another limitation was the sample size as this study considered 60 household heads from different villages in Buea Municipality. It thus proposes that other studies should be carried out in other agro-ecologiccal zones in Cameroon with the sample size increased.

Due to absence of consumption records by the household in the villages, most of the respondents did not know the appropriate measures of key variables used in the model and this gave the researcher problems in data cleaning, coding, and analysis.

Not all the variables that affect total monthly expenditure on smoked fish consumption were analyzed in this study, it thus proposes other research works be carried out with analysis of technological changes, changes in seasons, health status, ethnicity, religion, gender, and consumer cooperatives.

5.4 POLICY IMPLICATIONS OF FINDINGS AND CONCLUSION

Developments of policies to increase household disposable income, foods stamps to the elderly, will have a trickledown effect on household consumption of smoked fish in Buea Municipality. This is because consumers are key players in the agricultural value chain because they are the end users and production is incomplete until it reaches the hands of the final consumer. Given the importance of smoked fish in many dishes in Buea Municipality, it is therefore important for there to be effective value chains so as to ease households' access. The creation of consumer cooperatives will aid reduce the cost of smoked fish and hence reducing the prices thereby favouring consumers. Conclusively, the consumption of smoked fish in Buea Municipality is a function of disposable income, price of smoked fish, household size, age of household head, and taste and preference.

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APPENDIX

QUESTIONAIRE

UNIVERSITY OF BUEA

FACULTY OF AGRICULTURE AND VETERINARY MEDICINE

DEPARTMENT OF AGRICULTURAL ECONOMICS AND AGRIBUSINESS

RESEARCHER: NCHA ISSABEL NDANYU

This questionnaire is to elicit information on "Economic analysis of Consumption of Smoked Fish in Buea Municipality, South West Region, Cameroon." Feel free to express your opinion as information given would not be used for any other purpose other than the intended academic research. Thanks for your kind co-operation.

Introduction: mark an "X" where appropriate.

Respondent's Name: _____Tel: _____

Date of interview: _____ Time: _____ Village: _____

SECTION A.) Biographic profile

1) Age of respondent/head of household: _____ in

years

2) Gender of household head: (a.) Male ( ) (b.) Female ( )

3) Marital status: (a.) Single ( ) (b.) Married ( ) (c.) Divorced ( ) (d.) Widow(er) ( )

4) What is your religion? (a.) Mainstream Christian ( ) (b.) Protestant ( ) (c.) Muslim ( ) (d.) Traditional religion ( )

5) What is your ethnic group? (a.) Bakwerian ( ) (b.) Non-Bakwerian ( )

6) What is your level of education? (a.) Primary education = 0 -6 years ( ) (b.) Secondary education = 7 – 11 years ( ) (c.) High school = 12 – 13 years ( ) (d.) University = 14 – 16^{+} years ( )

7) Household composition; how many people regularly live in this household? (a.) 1 – 3 ( ) (b.) 4 - 6 ( ) (c.) 7 - 9 ( ) (d.) Above 10 ( )

8) Occupation of respondent: (a.) Involved in fish farming ( ) (b.) Not-involved in fish farming ( )

9) What is your main source of income? _____

10) Do you have other income generating activities of household? (a.) Yes ( ) (b.) No ( )

If Yes, which? _____

SECTION B.) Consumer Taste and Preferences

11) Do you like smoked fish? (a.) Yes ( ) (b.) No ( )

12) Which variety of smoked fish do you like most? (a.) Morocco ( ) (b.) Bar fish ( ) (c.) Catfish ( ) (d.) Djanga ( ) (e.) Others namely _____

13) What is your preference for smoked fish over fresh fish? (Rank it from 1 to 5) (a.) 1 ( ) (b.) 2 ( ) (c.) 3 ( ) (d.) 4 ( ) (e.) 5 ( )

14) Which factors determines your likeness for smoked fish? (a.) Taste ( ) (b.) Smell ( ) (c.) Colour ( ) (d.) texture ( ) (e.) others namely _____

SECTION C.) Consumption Patterns

15) What is your total monthly income? _____(in FCFA)

16) How much do your save monthly? _____(in FCFA)

17) Is your household food secured? (a.) Yes ( ) (b.) No ( )

18) Does your household eat balance diet? (a.) Yes ( ) (b.) No ( )

19) How many times do you eat a day? (a.) One ( ) (b.) Two ( ) (c.) Three ( ) (d.) Four ( )

20) Which type of meals do you consume weekly? (a.) Ekwang ( ) (b.) Eru ( ) (c.) Banga soup ( ) (d.) others list _____

21) Do you have any health challenge? (a.) Yes ( ) (b.) No ( )

22) What is your main source of protein? (a.) Fish ( ) (b.) Meat ( ) (c.) Chicken ( ) (d.) Mushroom ( ) (e.) others namely _____

23) How many times does your household consume smoked fish per week? (a.) 1 - 3 ( ) (b.) 4 - 6 ( ) (c.) 7 - 9 ( ) (d.) Above 10 ( )

24) What quantity of smoked fish is consumed by your household weekly? ____ (in kg)

25) How much is your total weekly expenditure on smoked fish? _____

(in FCFA)

26) Does your location affect your consumption pattern of smoked fish? (a.) Yes ( ) (b.) No ( )

27) What is the price per kilo of smoked fish? _____(in FCFA)

28) What is your substitute for smoked fish? (a.) Meat ( ) (b.) Chicken ( ) (c.) Mushroom ( ) (d) Others namely _____

39) What is the price per kilogram of its substitute? _____(in FCFA)

THANK YOU