

UNIVERSITY OF EDUCATION, WINNEBA

EXPLORING ALTERNATIVES TO PLASTICS FOOD PACKAGING:

A STUDY IN BEREKUM MUNICIPALITY.



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A STUDY IN BEREKUM**



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(200016650)

**A Thesis in the DEPARTMENT OF CATERING AND HOSPITALITY
EDUCATION, FACULTY OF VOCATIONAL EDUCATION, submitted to the
School of Graduate Studies, University of Education, Winneba. Kumasi campus
in partial fulfilment of the requirements for award of the Master of Philosophy
Education (Catering and Hospitality) degree**

OCTOBER, 2020

DECLARATION

STUDENT'S DECLARATION

I, Nanice Fosu declare that this dissertation, with the exception of quotations and references contained in published works which have all been cited and acknowledged, is entirely my own original work, and it has not been submitted either in part or whole for another degree elsewhere.

SIGNATURE:.....

DATE:

SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by the College of Technology Education, University of Education, Kumasi.

SUPERVISOR'S NAME: **DR. MRS ELLEN OLU**

SIGNATURE:.....

DATE:

ACKNOWLEDGEMENT

May the almighty God's name be glorified for his guidance and protection throughout this course. By his grace the sun could not harm me during the day nor the moon during the night.

Most debt and gratitude are owned to my supervisor Dr. Mrs. Ellen Olu, a lecturer at the Department of Catering and Hospitality, University of Education, Winneba. Kumasi campus for her constructive criticism and encouragement enabled me bring this work to a reality.



DEDICATION

I dedicate this work to my mother, madam Theresa Yeadoo for being with me through thick and thin, and also to all my well wishers.



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ABSTRACT

The research was to explore alternatives food packaging material other than the use of plastics bags by small scale food vendor in Berekum and its possible effect on the environment. The objectives of the study were to examine other possible alternative biodegradable packaging material such as using leaf and paper to package food other than plastic products by food vendors; to assess the knowledge of food vendors on the health implications of foods packaged in plastic products as well as their knowledge on the effects of plastics on the environment; and also to examine the perceptions and attitudes of consumers on the plastic waste disposal. The case study design was employed with small scale food vendors and consumers as the targeted population. Purposive and convenient sampling techniques were used to select a sample of size of 50 respondents for the study. Open-ended narrative, face-to-face general interview guide approach and observation were used to elicit response for the study. Test-retest technique was used to determine the reliability of the instrument. Data was analysed thematically. The study found out that: most predominant food packaging materials used by the vendors was plastic bags. Again packaging material choice was not based on any scientific research or medical analyses to ascertain the impact of the material on the nutrient or health. The study also revealed most of the waste identified were plastics solid waste as a result of it been used as a packaging material which has been disposed of after use. It was concluded that plastic after use serves as a major material for environmental hazard such as air and land pollution which poses danger to human life and plant, it was also concluded that consumers think it is the sole responsibility of the government to manage waste. The study

concluded that lack of knowledge on health implications on the material choice possibly could be linked with respondent's high rate of illiteracy and lack of nutritional education. It was recommended that alternative packaging materials like leaves and papers should be encouraged and be made more available and affordable for road-side food vendors to use to avoid over reliance on plastic bags. It was also recommended that education should be made to sensitize food vendor on the health implication on the use of plastic bags as packaging materials. The study also recommended that the municipal assembly should make bins available for appropriate waste disposal. It was again recommended that food vendors should be given enough training regularly to resort to more bio degradable and environmental friendly material like paper and leaves for the safety of the environment.



CHAPTER ONE

1.0 Background to the Study

According to Soroka (2002), food has been prepared and packaged since the earliest days of man's history on earth. In the early days of traditional food preparation, the main aim of packaging was preservation to maintain a supply of wholesome, nutritious food during the year and in particular to preserve it for hungry periods, for example when hunting was poor. Food was seldom sold but traded and bartered (Soroka, 2002). While the main objective food preparation remains the provision of a safe nutritious diet in order to maintain health, other aspects particularly the generation of wealth for the producer and seller worth researching.

In recent times, packaging of food is one area that has attracted attention because the use of suitable materials for cooked foods improves shelf-life and contributes to the wholesomeness of the products, (Stillwell, 1991). Food packaging is a structure designed to contain a commercial food product, i.e. to make it easier and safer to transport, to protect the product against contamination or loss, degradation or damage and to produce a convenient way to dispense the product. It is an essential way of ensuring that consumers obtain food products that correspond to their food quality and safety expectations. According to the World Bank, (1996) there has been a steady increase in the use of plastic products resulting in a proportionate rise in plastic waste in the municipal solid waste streams in large cities in sub-Saharan Africa. Waste from the consumption of products that are either preserved in plastic containers or packaged in plastic bags are on the ascendency in both developed and developing countries. The rapid growth of urban population and the increasing number of working women have caused changes in the eating habits of Ghanaians. Parents are often employed

outside the home and children attend schools far away. Consequently, fewer people, especially in the urban areas eat full home-cooked meals; much food is purchased from vendors. As a result, the fast-food industry has been growing rapidly. Around offices and factories, at schools, hospitals, and commercial centres, and along various street in the major towns and cities can be found food stalls, mostly operated by women. In Berekum, a municipality within the Bono Region of Ghana for example, has a number of restaurants, "chop bars," and food hawkers which is likely to increased consumption of street food rapidly in recent times. These street foods may be consumed where it is purchased or can be taken away and eaten elsewhere (WHO, 1996). Street food vending is a prevailing and distinctive part of a large informal sector. It is commonly seen in public places, particularly in the cities and is distinctive in the sense that it provides a basic need to the urban inhabitants (Muzaffar et al., 2009).

Apparently, many people prefer eating foods from vendors to preparing or cooking the food at home. There are different types of food vending sites including mobile stalls, a variety of push-carts, roadside stands, and hawkers depending upon the ingenuity of the individual, resources available, type of food sold and the availability of other facilities (FAO, 1990). Women are often owners or employees of street food businesses. According to FAO study, 70%-90% vendors are women, and they sell food in the street primarily to improve the food security of their family and for a degree of financial independence (FAO, 1997).

The adoption of a modern mode of packaging food, beverages, water and other products which is considered hygienic brought plastic packaging to replace the existing cultural packaging methods such as "leaf wrappers, brown paper and metal cup uses" in cities and towns (Adarkwa and Edmundsen, 1993; KMA, 1995; World Bank, 1995; Schweizer & Annoh, 1996; cited in Fobil and Hogarh, 2006). This widespread

replacement has made plastics the most favoured packaging materials in commerce with firms making huge profits and transferring the environmental cost associated with cleaning plastic waste on the general public.

Among the dwellers of Berekum, the packaging materials are most often dumped anywhere at the convenience of the trekking population since there is usually no mechanism that allows proper disposal of these materials after consumption of the cooked food. This gave rise to indiscriminate dumping of various materials ranging from leaf wrappers through paper to plastics. In Ghana even though some of the municipalities and assemblies have initiated policies to manage the waste disposal menace, these initiatives are without a long history hence requires continuous studies to explore. Exploring some other Alternatives to using Plastics Food Packaging since its decomposition is very difficult, in Ghana specifically within the Berekum Municipality, in order to consolidate these initiatives.

Quite a number of studies have been conducted in the area of plastic waste and its associated dangers to human and the environment as a whole. For instance, in the work of Njeru (2006), it was highlighted that besides plastic wastes being an issue of air pollution, it also poses diverse environmental challenges. Example, plastic wastes block gutters and drains, creating serious storm water problems like flooding, some of which become stagnant to breed mosquitoes. Also, consumption of plastic bags by livestock can lead to death. Since plastic bags are non-biodegradable, their presence in agricultural fields decreases soil productivity. When burned, plastic bags release toxic gases such as furan and dioxin, and leave unhealthy residues that include lead and cadmium.

1.2 Statement of the Problem

Plastic waste menace in the Berekum municipality would have improved drastically if food vendors considered the use of alternative modes of food packaging food such as leaves and papers which are biodegradable. Currently, all food vendors identified in the Berekum municipality use plastics of various forms, shapes and colours which are not biodegradable but constantly contribute to the plastic waste menace constantly affecting the soil quality of farm lands, choking gutters leading to flooding and worsening the health conditions of people living in the municipality. Food vendors expect the municipal assembly to collect all rubbish or waste made at the end of the day for disposal, however, the assembly's inability to rid the streets of all filth leads to accumulation of waste with plastics forming majority of the waste found in the municipality regardless of its inability to biodegrade.

Human survival mostly depends on quality food and water supply. However, poor sanitary conditions that keeps increasing due to increase in plastic waste resulting from its over dependence by food vendors in packaging food is a constant source of worry to the food vendors, people living in the community and the government of Ghana as a whole. Some studies supporting this pattern is a survey conducted in 2010 by Oteng-Ababio and metropolitan waste management departments of Takoradi in Ghana indicating that about 30% of 268 tons of waste generated in the Secondi-Takoradi metropolis is comprised of plastics with Accra metropolis generating 2000 tons of waste, and Kumasi metropolis generating 1200 tons of waste.

Poor sanitary conditions resulting from the plastic waste menace also contributes to the poor health of the people and further increases the financial burdens on the government. This study therefore seeks to explore alternatives that could be used in packaging foods that is more environmentally friendly and easily acceptable such leaves and paper for

use by food vendors as well as customers in the Berekum Municipality with the aim of reducing the plastic menace in the municipality and country at large.

1.4.1 General Objective

To ascertain alternatives food packaging material other than plastics for food packaging by food vendors in Berekum Municipality.

1.4.2 Specific Objective

1. To examine other possible alternative biodegradable packaging material such as using leaf and paper to package food other than plastic products by food vendors.
2. To assess the knowledge of food vendors on the health implications of foods packaged in plastic bags
3. To assess the knowledge of food vendors on the effects of plastics on the environment
4. To examine consumer's attitudes and perceptions of plastic waste disposals

1.5 Research Questions

This research addressed the following questions

1. What are the possibilities of using leaf and paper to package food by food vendors other than plastic materials?
2. How knowledgeable are food vendors on health implications of foods packaged in plastic products?
3. How knowledgeable are food vendors on the effects of plastics on the environment?
4. What are the perceptions of consumers on the use of plastic materials in packaging foods by food vendors in Berekum?

1.6 Significance of the Study

The growing trends of food vendors on the street and the influx of small-scale food producers is now a major concern to consumers and government organizations responsible for maintaining healthy life. In view of this the study will inform the Food and Drugs Authority to formulate policies that will regulate the activities of small scale food vendors in terms of proper packaging and waste disposal practices which pose a threat to consumers' life and the environment. It will contribute to the body of knowledge in the area of science and hospitality so that in future other researcher can rely on that to get enough or well informed source of literature. it will also help reduce drastically the amount of plastic waste generated within the municipality. The study will help reduce the amount spent on managing plastic waste in the municipality. It will help reduce the importation of foreign materials and will help promote the use of our locally produced materials which are environmentally friendly.

1.7 Delimitation

This study was delimited to only the Berekum Municipality in the Bono Region of Ghana. It was also be delimited to the food packaging practices regarding plastics. The study focused on only two possible alternatives, mainly leaf and paper and its impact on the environmental hazards. In view of this, it may not be possible to generalize the result of this study beyond the Berekum Municipality. However, the results of this study could be replicated in any other district in the country

1.8 Limitation of the Study

In the course of the research, several difficulties were encountered. Paramount among them are inadequate finances and time constraint, as well as reluctance of some of the respondents to make available relevant information even though they were reassured that the study will not have any legal, political or economic undertones. The span of time allocated for the study was a challenge since the study was designed to meet a specific deadline. All the cost associated with the investigations was borne by the researcher alone. Data gathering was also delayed due to the corona virus pandemic. The outlined challenges notwithstanding, the research strategized well enough to mitigate the perils that are likely to emerge in order to conduct a credible research work.

1.9 Operational Definitions of Terms

Solid Waste: Solid waste is any material that arises from human and animal activities that are normally discarded as useless or unwanted. Solid waste includes non-hazardous industrial, commercial and domestic waste such as household organic trash, street sweeping, institutional garbage and construction waste (Zerbock, 2003)

Solid Waste Management (SWM): refers to the collection, transportation, treatment, final disposal and recycling of solid wastes.

Disposal of Waste: final handling of solid waste following collection, processing or incineration.

Enforcement: administrative or legal procedures and actions to require compliance with legislation, regulations or limitations.

Municipal/Domestic Waste: generally liquid and solid waste originating from a mixture of domestic (household), commercial, and industrial sources.

Reuse: application of appropriately treated materials for a constructive purpose.

1.10 Abbreviations Used



EPA	:	Environmental Protection Agency
BMA	:	Berekum Municipal Assembly
SWM	:	Solid Waste Management
WMD	:	Waste Management Department
NESAP	:	National Environmental Sanitation Action Plan
NGO	:	Non-Governmental Organization

1.11 Organization of the Study

The study was organized into five chapters. Chapter Two focused on the review of related literature to the study. Chapter Three focused on the methodology pivoted around design of the study, the study area, population, sample and sampling techniques, instrument for data collection, data collection procedure and analysis and ethical issues. Chapter four presented the analysis of the data while Chapter five presented the results, findings and recommendation of the research.



CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Theoretical frame work

This research is being shaped by the diffusion of innovation theory. The multidisciplinary nature of diffusion research cuts across various scientific fields; a diffusion approach provides a common conceptual ground that bridges these divergent disciplines and methodologies. One can understand social change processes more accurately if the innovation is followed over time as it courses through the structure of a social system (Rogers, 1983). The diffusion of innovation theory has been used to explain how innovations have penetrated into a society and have been fully adopted or how it has failed to be accepted by the target population. Rogers (1983) defines diffusion as the process by which an innovation is communicated through certain channels over time among the members of a social system. Diffusion scholars have long recognized that an individual's decision about an innovation is not an instantaneous act. Rather it is a process that occurs over time and consists of a series of actions.

The steps identified in an innovation process include; recognition of need or problem through research, development, commercialization of an innovation, diffusion and adoption and then consequences. The diffusion of innovation and an adoption as a process is not generic; it varies from product to product and or service to service. Some products or service offerings gain quick acceptance, and the diffusion is fast and rapid; for other products and services, the process may be slow and take considerable amount of time. Diffusion of innovation and subsequent adoption is impacted by socio-economic, cultural, technological as well as legal factors; it is also impacted by

individual determinants like psychological variables and demographics; these are all forces in most cases “uncontrollable” by the marketer. Plastics have evolved over the years to be used to serve a variety of purposes all over the world.

Time does play a role in the diffusion of innovation. Time does not exist independently of events but it is an aspect of every activity. A conceptual and analytical strength is gained by incorporating time as an essential element in the analyses of human behavioural change. Time is involved in diffusion in the innovation decision process by which an individual passes from first knowledge of an innovation through its adoption or rejection (Rogers, 1983).

According to Rogers (1983) the process involves five (5) steps presented in the frame below:

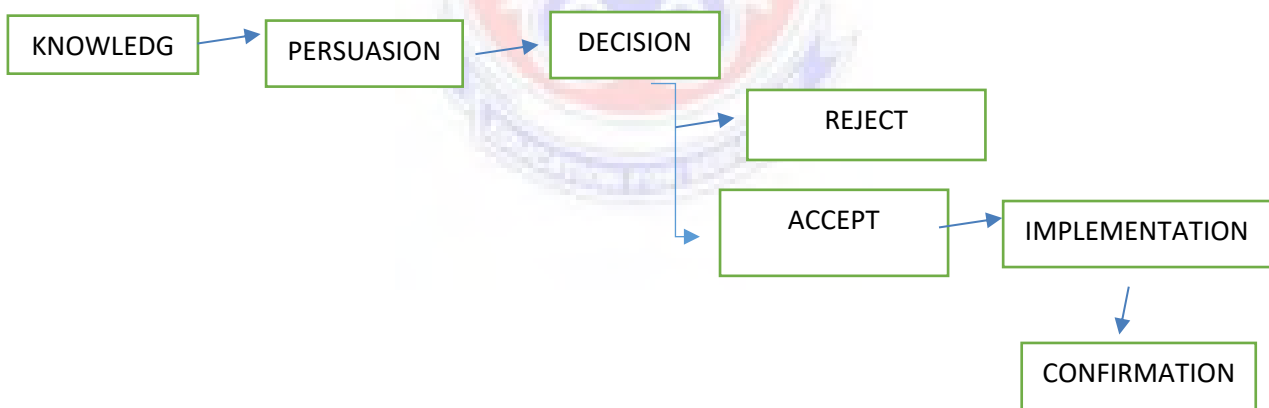


Figure2.1: A model of stages in the Innovation-decision

In the diagram above, an individual is exposed to the innovation when the person gets knowledge about the product. Knowledge occurs when an individual is exposed to the innovation’s existence and gains some understanding of how it functions. Persuasion occurs when an individual form a favourable or unfavourable attitude towards the

innovation. The individual makes a decision when engaged in activities that lead to a choice to accept or reject the innovation. The innovation is then used by the individual - implementation and then confirmed (Confirmation) when an individual seeks reinforcement of an innovation-decision already made, but may reverse this previous decision if exposed to conflicting messages about the innovation. In that event though the individual might have accepted to use the innovation, certain information on the product received later is likely to change the individual's attitude towards the product. At every level of the diagram described above, communication is very important. Rogers (1983) defines communication channel as the means by which messages get from one individual to another. An obvious principle of human communication is that the transfer of ideas occurs most frequently between two individuals who are alike, similar or homophilous. Such communication is likely to be more effective and rewarding. It is likely to lead to knowledge gain, attitude formation and change and overt behaviour change after a carefully going through the steps over a period of time. The important factor affecting the adoption rate of any innovation is its compatibility with the values, beliefs and past experiences of social system. The plastic bag waste disposal menace has had consequences on the environment: land, air and water with attendant health problems on humans and possible death in animals. The relevance of the diffusion of innovation theory to the study is to explore alternatives food packaging material other than the use of plastics bags by small scale food vendor in Berekum and its possible effect on the environmental. This is because when people tend to be more innovative by rethinking of new way of doing things as a means of improving on existing situations, life conditions become better. Here food vender will tend to think of new way of packaging food other than the plastic bags which over the years have pose environmental challenge and resort to other material that are biodegradable and

environmentally friendly. Hence the choice of diffusion of innovation theory for the study is very appropriate.

2.2 Food Storage and Packaging Materials

Packaging and storage materials first covers rigid containers such as glass, pottery, tins and cans, plastic bottles, wood and cardboard. The second part deals with flexible packaging including paper, plastic films, aluminum foil and cloth.

2.2.1 Packaging in hard containers

1) *Jars and bottles*

Glass containers used for food include old jars and bottles that originally held manufactured products such as beer, soft drinks, creams, and pomade. They are obtained from dealers in discarded containers, who collect them from homes and, in some cases, from refuse dumps. Jars and bottles are used even if they have minor defects at the top. They do not have any special crown or cover (Franklin, 2004). In general, the foods packaged in bottles and jars contain natural or added sugar and therefore attract flies. Unfortunately, the products are not sterilized before or after packaging and may remain uncovered during sale. With the exception of *akpe-teshie*, which is strong liquor, the products have a very short shelf-life at ambient temperatures and are meant to be sold within a day (Soroka, 2009).

Glass containers are re-used as long as they remain undamaged. They do not react with foods and can be washed. Products packed in glass have an aesthetic appeal; but, because of the inadequate supply of water in many Ghanaian homes and the low level of sanitation, the washing of these containers may be ineffective. Products sold in glass

containers are not labelled. Purchase and use, therefore, depend on previous experience with or knowledge of the foods (Stillwell, 1991).

2) *Glass-sided boxes*

A variety of ready-to-eat foods are displayed for sale in large boxes with transparent glass sides. Over the last few years these boxes have become popular for the sale of pastries and other fried or baked foods. These items previously were kept in open trays, large pans, and bowls and many vendors still use these containers. The base and top of the boxes are made of wood, which holds one or more glass walls in place. The boxes are available in sizes of about 20 x 30 cm with a height of 10 to 30 cm or larger. They may be opened either at the top or from the sides. Nylon mosquito netting is sometimes used in place of glass (Selke, 1994). These boxes protect the food from flies and dirt. This has improved the way in which foods are displayed to customers.

However, it may be warm and damp inside the boxes and frequent opening and closing admits flies. Also, the foods may be handled many times by different customers for inspection before purchase. Such practices provide avenues for contamination and microbial growth.

The main physical advantage of glass is its inertness and impermeability. Processors do not need to worry about the type of glass needed as they do with cans and plastics which can react with certain types of foods. Glass has the additional major advantage of being re-usable, recyclable and not damaging to the environment.

According to Soroka (2002), food packaged in glass containers can have a very long shelf life provided that the food has been properly processed before packaging, no contamination occurs at the filling stage and that the container is properly closed with

a lid or seal. It should be remembered that the pack is only as good as the closure. Recommended shelf-lives vary but are usually 6 to 12 months not because the product actually deteriorates, but because over time there is a gradual loss of colour and flavour. Some foods, wines and spirits for example actually improve during prolonged storage and it is not unusual for a bottle of wine to be drunk ten or more years after packing (Yam, 2009). Glass packaging manufacture is only economically possible at large scale. As the moulds are very expensive, only very large food companies can afford to have their own moulds in the glass factory to produce their own special bottles. Various standard colors are made including clear, green or brown depending upon the protection needed from light (Soroka, 2002).

According to Bix, et al (2003) pottery is one of the most ancient forms of traditional packaging. Pottery wine and oil jars have been used for thousands of years. Hundreds of years ago crude sugar was crystallized in pots, a stage known as potting. Potting later was used to describe the method of preserving 'potted meats' in clay containers. Although pottery containers have now been largely replaced by other materials for commercial food packaging they still are widely used in some countries for certain products, for example cooking oil, tomato paste and gun They also find application when packing high value, luxury foods (Soroka, 2002).

Pottery containers are made from clays either by hand or with the use of moulds. Hand-made pots vary considerably in size and shape while moulded ware is far more standard and thus more suitable for routine food packaging. After production the pot has to be baked or fired in a kiln at high temperatures, between 600 and 1250°C. The

appearance and properties of the final product depend upon the type of clay used, the firing temperature and whether or not the pot is glazed. Ordinary clays fired at low temperatures yield earthenware. Other clay type, fired at higher temperatures produces stoneware while the use of special clays and very high temperatures yields porcelain. The fired pot may, if required, be dipped in a glaze and returned to the kiln where the glaze melts to a glassy coating. Both external and internal glazing can be applied. When earthenware is glazed, the glaze does not bond into the pot but essentially sticks to the surface. As the pot cools such a glaze often 'crazes' and the tiny cracks so produced mean that an incomplete impervious glaze coating forms. When stoneware is glazed the glaze bonds into the clay and a far more perfect protection results (Robertson, 2013).

2.2.2. Packaging in flexible materials

1) *Leaves*

According to Roden, (1997) most traditional maize products consumed in southern Ghana are wrapped in leaves. Leaves commonly used for wrapping food include those of *Thespesiapopulnea* (*Malvaceae* family), *Marantoclea* spp. (*Marantaceae* family), and the plantain (*Musa paradisiaca*) and the sheaths of maize (corn, *Zea mays*). Some items are packaged raw before cooking. Others are wrapped in the leaves immediately after cooking, while they are still hot. In the preparation of *fantekenkey*, a maize product, for example, the raw dough is wrapped completely in four or five layers of brown plantain leaves before cooking. For *gakenkey* the raw dough is incompletely wrapped in a single layer of maize sheaths. Portions of the dough remain exposed and may be lost in the water during cooking (Robertson, 2013).

Boiling or baking sterilizes foods pre-packaged in leaves. Fantekenkey, for example, has a shelf life of five to seven days, but other products such as gakenkey and abolo store for only two or three days because of incomplete wrapping, which results in recontamination and spoilage, especially by moulds. According to Selke (1994) products wrapped in leaves after cooking generally have a shelf-life of only two days. Etsew (another form of fantekenkey) and 'agidi', which are wrapped while hot in plantain leaves and the leaves of *Marantoclea spp.* respectively, can be stored for three days. Cooked rice and beans are stored in bulk in a large pan and sold wrapped in the leaves of *T. populnea*. They cannot be stored for more than 12 hours in the leaf.

Leaves for packaging are poorly handled and transported. They are often dirty and are kept in the open with little or no provision for washing before use. They may therefore be a source of microbial contamination of food. When broad leaves are stored for more than a week they deteriorate through drying out or decay. Maize sheaths, however, can be stored for several months and are the only type of leaf that is sometimes retrieved and re-used for packaging (Stillwell, 1991).

2) *Paper*

Paper is used extensively to package a variety of ready-to-eat foods, with newsprint the most commonly used. Paper wrappers are not pre-formed into any shape, but pieces are torn from a bigger sheet depending on the type of product. A few vendors, however, package popcorn in well-designed, cone-shaped paper containers (Twede, 2005).

From the point of view of sanitation, the quality of paper is generally poor. Any old newspaper, multi-wall Portland cement sacks, magazines, and old stationery from

schools and offices are used. The paper is not stored properly and cannot be cleaned. Such poor hygienic practices coupled with the harmful effect of printing ink make the use of paper for wrapping food a health hazard. Paper is also used as a secondary packaging material for some pre-packaged products such as kenkey (Robertson, 2013).

3) *Plastic bags*

Transparent plastic film formed into bags is becoming increasingly important in the packaging of a variety of foods. Low-density polyethylene (commonly called polythene) is the best known. The adoption of these bags in packaging has significantly improved the display of ready-to-eat foods from aesthetic and hygienic points of view. Unfortunately, many food vendors are not familiar with the suitability or otherwise of the various types of plastic films for different products. This can lead to deterioration in the quality of the foods (Selke, 2004).

Polythene bags are manufactured locally and are available in different sizes, ranging from narrow strips of 3 x 5 cm to larger bags measuring 25 x 40 cm. These film wraps are desirable for packaging food because they are much less permeable to water vapour and gases than paper and leaves and are chemically inactive with food. They are used to package both solid and liquid foods. Polythene bags are useful for dry products such as gari, sugar, coffee, and cocoa powders, as the items remain dry for a long time if properly sealed. Since heat-sealing devices are not readily available to many vendors, the open ends of the bags are usually tied into firm knots after the food is inserted. Bread and other pastries are packed in polythene bags on a large scale.

Many vendors expose their products to the sun while sealed in the bags. Moisture condenses inside the bags, and this facilitates mould growth. Sometimes air is blown into bags with the mouth to open them. This introduces vapour and microorganisms, which sets the stage for spoilage when foods are placed in the bags (Mead, 1997). ToSelke(2004) home-made ice follies, which are commonly frozen in plastic cups, and beverages such as *nmadaa*, normally served in calabashes, are now sometimes packaged in small polythene bags for sale. Iced water is also sold in plastic bags and sachet by some vendors in response to official directives aimed at curbing the unhygienic practice of using a single cup to distribute water to many customers. The use of polythene bags to package liquids has not been very successful, however, because defects in the bags frequently lead to spillage.

Some vendors package vegetables such as carrots, cabbages, and tomatoes in polythene bags with tied ends. This speeds the rate of deterioration since the exchange of moisture and gas with the atmosphere is cut off. Heavier-weight polyethylene film wraps have limited application for street foods except for bulk packaging, or covering such items require heat and moisture to be retained (Robertson, 2013).

2.3 Food Packaging Materials Choice

The key to successful packaging is to select the package material and design that best satisfy competing needs with regard to product characteristics, marketing considerations (including distribution needs and consumer needs), environmental and waste management issues, and cost. Balancing so many factors is difficult and also requires a different analysis for each product. Factors to be considered include the properties of the packaging material, the type of food to be packaged, possible food/package interactions, the intended market for the product, and the desired product

shelf life. Other factors include environmental conditions during storage and distribution, product end-use, eventual package disposal, and costs related to the package throughout the production and distribution process.

The rate of consumption of foods packaged in plastics is very high among city residents in most countries of Sub-Saharan Africa. There is high intake of water by pedestrians and traders on the streets due to intense heat which characterises countries located within the tropical and equatorial latitudes of Sub-Saharan Africa. It is very common to find people trekking and selling iced water on the street and in vehicular traffic. However, Stillwell (1991) is of the view that Containers for food should facilitate the transport of the product, prevent its contamination or loss, and protect it against damage or degradation. According to United Nation Development Programme (UNDP) survey report, solid waste disposal is the second most pressing problem facing urban city dwellers after unemployment (Da Zhu *et al.*, 2008). Solid wastes consist of solid material such as plastics and papers generated by households and other actors in the economy.

Ideally, a food package would consist of materials that maintain the quality and safety of the food over time; are attractive, convenient, and easy to use while conveying all the desired information; are made from renewable resources, thereby generating no waste for disposal; and are inexpensive. Rarely, if ever, do today's food packages meet these lofty goals. Creating a food package is as much art as science, trying to achieve the best overall result without falling below acceptable standards in any single category.

From a product characteristic perspective, the inertness and absolute barrier properties of glass make it the best material for most packaging applications. However,

the economic and safety disadvantages of glass boost the use of alternatives such as plastics. While plastics offer a wide range of properties and are used in various food applications, their permeability is less than optimal—unlike metal, which is totally impervious to light, moisture, and air. Attempts to balance competing needs can sometimes be addressed by mixing packaging materials such as combining different plastics through coextrusion or lamination or by laminating plastics with foil or paper. Plain paper is not used to protect foods for long periods of time because it has poor barrier properties and is not heat sealable. When used as primary packaging (i.e., in contact with food), paper is almost always treated, coated, laminated, or impregnated with materials such as waxes, resins, or lacquers to improve functional and protective properties. In contrast, paperboard is seldom used for direct food contact, even though it is thicker than paper.

Ultimately, the consumer plays a significant role in package design. Consumer desires drive product sales, and the package is a significant sales tool. Although a bulk glass bottle might be the best material for fruit juice or a sports beverage, sales will be affected if competitors continue to use plastic to meet the consumer desire for a shatterproof, portable, single-serving container.

2.4 Food Packaging and Food Poisoning

National Institute of Health (2006) indicates that food borne illness, commonly called “food poisoning”, is caused by bacteria, toxins, viruses, parasites, and poisons. Roughly 7 million people die of food poisoning each year, with about 10 times as many suffering from a non-fatal version. According to Stillwell (1991) the two most common factors leading to cases of bacterial foodborne illness are cross-contamination of ready-to-eat food from other uncooked foods and improper temperature control. Less

commonly, acute adverse reactions can also occur if chemical contamination of food occurs, for example from improper storage, or use of non-food grade soaps and disinfectants.

Food can also be adulterated by a very wide range of articles (known as "foreign bodies") during farming, manufacture, cooking, packaging, distribution, or sale. These foreign bodies can include pests or their droppings, hairs, cigarette butts, wood chips, and all manner of other contaminants. It is possible for certain types of food to become contaminated if stored or presented in an unsafe container, such as a ceramic pot with lead-based glaze (Harold, 2004).

Food poisoning has been recognized as a disease since as early as Hippocrates. The sale of rancid, contaminated, or adulterated food was commonplace until the introduction of hygiene, refrigeration, and vermin controls in the 19th century. Discovery of techniques for killing bacteria using heat, and other microbiological studies by scientists such as Louis Pasteur, contributed to the modern sanitation standards that are ubiquitous in developed nations today. This was further underpinned by the work of Justus von Liebig, which led to the development of modern food storage and food preservation methods (Mead, 1997). In more recent years, a greater understanding of the causes of food-borne illnesses has led to the development of more systematic approaches such as the Hazard Analysis and Critical Control Points (HACCP), which can identify and eliminate many risks. Sotomayor, *et.al.*(2007,)recommended measures for ensuring food safety include maintaining a clean preparation area with foods of different types kept separate, ensuring an

adequate cooking temperature, and refrigerating foods promptly after cooking (Harold, 2004).

According to Potter and Hotchkiss (1995) foods that spoil easily, such as meats, dairy, and seafood, must be prepared a certain way to avoid contaminating the people for whom they are prepared. As such, the general rule of thumb is that cold foods (such as dairy products) should be kept cold and hot foods (such as soup) should be kept hot until storage. Cold meats, such as chicken, that are to be cooked should not be placed at room temperature for thawing, at the risk of dangerous bacterial growth, such as Salmonella or E. coli.

2.5 Plastic Bags Waste and Effects on Environment, Humans and Animals

Plastic Bags Waste and Effects on Environment, Humans and Animals. Most plastic bags become waste after they have served the purpose of carrying goods from the shop, market centres and streets. Very often, the individual has practically no use for the plastic bag especially the thin plastic bags after first use. Ellis et al, (2005) revealed that in all stages of a plastic bag's life, from manufacturing to disposal, negative social and environmental impacts are associated with it. The environment, including its soil, water and air, is affected directly in numerous ways, beginning with the extraction and use of fossil fuels during the manufacturing process of plastic bags. Most plastics deteriorate in full sunlight, but never decompose completely when buried in landfills. Plastic bags can exist up to 1000 years without being decomposed by sun light and/or microorganisms (Clapp & Swanston (2009) citing UNEP, 2005). Research has demonstrated that the thickness and weight of a plastic bag does not impact on the ease with which it may become litter if placed in a waste receptacle and dispersed by the

wind (Tough, 2007 citing Verghese, 2006) Waste if not managed properly becomes a danger to health, a nuisance, and possibly a major social and economic problem. Plastic bags do not have any boundaries; hence they pollute places several kilometres away from where they are dumped. This is because of their negligible weight and structure which make it possible for them to be filled up with air just like balloons, and get blown and dispersed over large areas (Mangizvo, 2012).

Zoomlion is a waste management and environmental sanitation company in Ghana and Africa. Anthony (2003) reports that accumulation of plastic bag wastes causes environmental pollution that can be manifested in a number of ways. One of the problems is deterioration of natural beauty of an environment. On land, plastic bags are some of the most prevalent types of litter in habited areas. Littering is often a serious problem in developing countries where waste collection infrastructure is less developed than in wealthier nations. Impacts on human health of plastic bag waste are perhaps the most serious of the effects associated with plastic bags, ranging from health problems associated with emissions to death. Ahrens (2011) citing the Ocean Conservancy found that 5% of all marine debris collected over the past 25 years was plastic shopping bags, with 7,825,319 bags collected from beaches, streams, and waterways during that period. They can harm animals that accidentally consume them and sometimes lead to deaths. Clapp and Swanston, (2009) citing Krulwich, et al (2001), stated that the key rationale specific to India's imposition of a ban on the use of plastic bags is that they pose a health threat to free-roaming sacred cows. Cows eat discarded bags along with other garbage in the streets, and starve to death because the plastic bags clog their digestive systems. Air pollution caused by the emission of toxic chemicals and CO₂ during the manufacturing of plastic bags is a significant part of the

environmental impact of this product (Ellis et al 2005). Ellis et al (2005) citing the Institute for Lifecycle Environmental Assessment (1990), state that the manufacturing of two plastic bags produces 1.1 kg of atmospheric pollution, which contributes to acid rain and smog. Acid rain and smog are recognized as a serious threat to natural and human-made environments. Ellis et al, (2005) make reference to the Institute for Lifecycle Environmental Assessment (1990) stating that the manufacturing of two plastic bags produces 0.1 g of waterborne waste, which has the capability of disrupting associated. An organisation started in 1972 to fight for a healthy ocean ecosystem, such as waterways and the life that they support. According to a report by the Environmental Protection Agency (EPA) to the UNFCCC in 2011, emissions from the waste sector in Ghana constituted an average of 10% between 2000 and 2006, which is approximately 8% higher than the 1990 levels. Disposal of solid waste to land with relative deeper depth and to sanitary landfill sites is increasingly becoming common practices in urban waste management. This provides suitable conditions for the production of methane, which is not managed in any way in Ghana. Growing rates of per capita waste generation especially in the urban areas due to population increase and urbanisation are generally driving the increases in emissions (EPA, 2011). A social consequence of poor sanitation and waste management is its effects on children.

According to Owusu (2010), citing Bartlett (1999), poor living environments have particularly far-reaching consequences for children and adolescents as they are more vulnerable than adults to a range of environmental concerns and more likely to be affected in ways that have longer term repercussions. It is widely acknowledged that clean and well-kept neighbourhoods are not only good for the health of children but also offers them opportunities for companionship, recreation and social learning

(Owusu, (2010) citing UNFPA, 2007). In addition, the environment serves as the arena for cultural rules and norms that guide the activities and behaviours which are reinforced and reproduced through the repetition of those daily activities in which people participate (Owusu (2010), citing Pellow, 2002). An important effect of this observation is that children's world view is likely to be affected by what they observe in a community. Children who grow up within an environment with garbage all around and poor sanitary practices are unlikely to behave any differently from their older community members who litter in the community (Owusu, 2010). This may partly account for indiscipline behaviour towards littering and the lack of appreciation of good sanitary practices.

2.6 Economic and Environmental Challenges

The environment is a major consideration in planning for health, sanitation and food safety. There is the need therefore to assess the environmental situation of the food preparation and vending sites to identify environmental challenges which acts as constraints to development (Schmdit and Rodrick 2003). A variety of wastes are produced in food processing facilities with a major proportion being liquid waste which is mainly waste water from cleaning of facilities, equipment/utensils, raw materials and processes such as blanching. Liquid waste is relatively easier to dispose off than solid wastes when screened of solid residues and pre-treated using sanitizers to purify and destroy microorganisms before discharge into the municipal sewers or reuse (Marriott and Gravani, 2006; Polanski, 2009). Solid wastes are mainly the peels and unwanted portion of raw materials, most difficult to manage and comprise of inorganic and organic materials (Polanski, 2009). Its accumulation for even a short period of time attracts insects, rodents and produce odours. Methods of disposing

garbage include land fill, incineration, recycling and composting. Institutions employ the services of waste management companies to dispose of the waste (Russ and Meyer-Pittroff, 2004). Incineration is a way of discarding waste where solid organic wastes are subjected to combustion (Marriott and Gravani, 2006). Composting is a method of discarding organic waste such as the unused portion of the raw materials to decompose and used as fertilizers (Russ and Meyer-Pittroff, 2004). Recycling wastes such as aluminium beverage cans, plastic, polyethylene are sold to recycling companies (Russ and Meyer-Pittroff, 2004). Waste disposal needs to be done properly and often because they can attract pests resulting in infestation in food storage facilities, the plant and the environment. Trash cans must have a tight fitting lid, lined with polyethylene and be easy to clean (Marriott and Gravani, 2006). Every food processing institution must have an adequate system for collection, managing and disposing waste materials.

2.7 Environmental and Regulatory Frameworks in Ghana

Environmental sanitation is aimed at developing and maintaining a clean, safe and pleasant physical and natural environment in all human settlements to promote socio-cultural economic and physical well-being of all sections of the population (ESP, 2010). A healthier and wealthier population will tend to generate more of all waste types (domestic, industrial, commercial, institutional and hazardous). The challenge of increasing disease burden from poor environmental sanitation, improving the attitudes and behaviour of individuals, households and communities towards environmental sanitation remains central in any effort aimed at making sustainable progress. There is therefore the need for urgent action based on a clear national strategy (policies, plans, and programmes) to manage this trend supported by sustainable financing. Environmental policy can be defined in several ways. Mickwitz, (2003) citing

Lindquist (1996) differentiated between definitions based on function, institution and purpose. A definition based on function would define policies that affect the environment as environmental policy, whereas an institutional definition would view policies undertaken by: a certain set of institutions; an environmental ministry; certain agencies; etc., as environmental policy. Environmental policy can be seen as courses of action which are intended to affect society – in terms of values and beliefs, action and organisation – in such a way as to improve, or to prevent the deterioration of, the quality of the natural environment (Mickwitz, (2003) citing Lindquist (1996). Environmental policy instruments are a set of techniques that governmental authorities wield their power in attempting to affect society – in terms of values and beliefs, action and organisation.

The power is used to improve, or to prevent the deterioration of the quality of the natural environment (Mickwitz, (2003) citing Vedung, 1998). Regulations aim at modification of the set of options open to agents. Instruments used include: standards, bans, permits, zoning and restrictions. The most comprehensive environmental policy in Ghana is the National Environmental Policy and National Environmental Action Plan enacted in 1991. The Policy seeks to improve living conditions and the quality of life of the entire citizenry and to harmonize economic development with natural resources conservation. The Action Plan was the first comprehensive plan for environmental protection for Ghana in which the following activities are spelled out: Investment related to the environmental protection institutional building commitment of the government to policy making, legislation and management of land resources, forest and wildlife, water, marine and coastal ecosystem, human settlements and pollution control. Waste management practices in Ghana are guided by the

Environmental Sanitation Policy of 1999 which was revised in 2010. The document spells out the roles of the various stakeholders including the private sector. The policy also gives the local assemblies the right to manage waste at the local level. Hence there are bye-laws to this effect. The problem, however, is the fact that solid waste in the policy is defined as comprising all solid waste material generated by households, institutions (including health care waste from hospitals and clinics), commercial establishments and industries and discharged from their premises for collection; all litter and clandestine piles of such wastes; street sweepings, drain cleanings, construction/demolition waste, dead animals and other waste materials.

All solid waste (plastics, food, concrete, leaves, etc) are put together and they all end up at the landfill site. The primary responsibility of solid waste management lies with the metropolis, even though the private sector does assist in the collection of waste. Although there is no legislation on plastics, there are relevant laws and ordinances that regulate its use. There is the Criminal Code 1960, Act 29 Chapter 8 (Public Nuisance) Whoever does any of the following acts shall be liable to a fine not exceeding 50 pounds, namely throwing of rubbish in the street or in front of premises, nuisances defacing public notices or buildings, drumming etc. Cap 75 of May 13, 1911 (Mosquito Ordinance) permits the lawful entry of sanitary officers into individual premises to destroy mosquito larvae. There is also the Town and Country Planning Ordinance- Cap 84. The plastic producing companies have standards to adhere to which is closely monitored by the EPA; permits are issued by EPA before commencement of operations by any plastic producing company in the country. The companies also have to produce quarterly and annual reports for EPA to ascertain whether they are complying with regulations that bothers on their operations in the country.

In Ghana, the Local Government Act, 1993 (Act 462) empowers the district assemblies by Section 10 (3) (e) to be responsible for the development, improvement and management of human settlements and the environment of the districts. Each district assembly is also established by Act 462 as the Planning Authority (Section 46 I). One important function of the Planning Authority very relevant to and having implications for waste management is its powers of enforcement. There is therefore a legal and legitimate basis for the intervention of the assemblies to control and deal with plastic waste littering. There are bye laws made pursuant to Section 79 of Act 462. The bye laws give exclusive responsibility to the assemblies or their registered agents or contractors for the management of both solid and liquid waste within their jurisdiction or administration.



CHAPTER THREE

METHODOLOGY

3.1 Methodology

Qualitative research was used to ascertain in-depth understanding of human behaviour and perception in relation to exploring alternatives to plastics food packaging material in Berekum Municipality.

3.3 Design for the Study

A case study design was used for the research. According to Seidu (2006), a case study involves an intensive investigation on the complex factors that contributed to the individuality of a social unit, a person, family or a group of people. The researcher considered a case study design because the topic under study is only peculiar to that of Berekum Municipality. Hence, a case of exploring alternatives to plastics food packaging in Berekum Municipality and not any other. Here the outcome of the research may not necessarily be generalized to include all the Municipalities in Ghana. With this all data relevant to the case are gathered and organized in terms of the case. This rested on the assumption that the case being studied is typical of cases of a certain type. However, through intensive analysis generalizations may be made that will be applicable to the cases of the same type.

3.4 Population of the Study

The population of this study was made up of all the small-scale food vendors and their customers in the Berekum Municipality of the Bono region. According to the Environmental Protection Agency inspectors the total registered members mandated

to sell food items are estimated to be about 1245 vendors in the municipality. Hence, the registered members who were road side food vendors constituted the population for the study.

3.5 Sample and Sampling Technique

Thirty (30) small scale food vendors and twenty (20) consumers were selected to constitute the sample size. Purposive sampling techniques was employed to select thirty (30) small scale food vendors for the study. Purposive sampling technique was considered because it is the type of sampling method where the researcher carefully selects the sample to reflect the purpose of the investigation. Again, convenient sampling procedure was used to select twenty (20) consumers for the study. With this the researcher at a convenience kept visiting and contacted the market at convenience until a quota of 50 were contacted to respond to the instrument and those who agreed were used for the study.

3.6 Instruments for Data Collection

The researcher used open- ended narrative face-to-face general interview guide approach and observation to gather the necessary data for the study. The interviews were conducted with the sampled population and was guided by the questions based on the research questions. The interview guide was made up of five sections. Section A dealt with the background of respondent, section B focused on examining the possibilities of using leaf and paper to package food other than plastic products by food vendors. Section C accessed the knowledge of food vendors on the health implications of foods packaged in plastic products. section D focused on the knowledge of food vendors on the effects of plastics on the environment whiles section E focused on the

perceptions of consumers on the use of plastic materials in packaging foods by food vendors in Berekum.

3.7 Validity of Instrument

To be certain that the interview guide that will be used in the research is valid, it was discussed with colleagues and later vetted by the researcher's supervisor. Some additions were suggested to enrich the interview guide by the colleagues and the supervisor.

3.8 Reliability of Instrument

Reliability is the degree of consistency that the instrument or procedure demonstrates. That is, whatever the instrument is measuring, it does so consistently. It is also the degree of a research instrument (a test, a questionnaire, an interview schedule, or an observation scheme) to measure a subject or variable at different occasions and on all occasions consistently to give the same or similar results (Seidu, 2006). Five small scale food vendors in Dormaa Ahenkro were selected for the pilot testing of the instrument to test its reliability. The same groups were tested two weeks later. Cronbach's Alpha ($\hat{\alpha}$) was computed for all the two sections to determine the internal consistency and co-efficient of the instrument. According to Munro and Page (1993) Cronbach's Alpha ($\hat{\alpha}$) co-efficient is a measure of internal consistency reliability. Such reliability, the continue, is an alternative way of looking at the extent to which items go together. According to Coolican (1999) Cronbach's Alpha ($\hat{\alpha}$) is probably the commonly used statistics for estimating a test's reliability.

3.10 Data Analysis

The interview responses were recorded both electronically and manually in a field notebook. The data was transcribed, edited and analyzed base on themes derived from the objective of the study. This focused on identifying key ideas and patterns of responses received from the field in relation to the research objectives. Data was presented using SPSS or Excel.

3.11 Ethical Considerations

Consent for the conduct of the research was sought from the food venders. A letter of introduction was obtained from the head of department. This enabled the researcher to seek consent for conduct of the study. This enabled the researcher to formally introduce herself to the study participants, during data collection. The researcher also liaised with the district assembly and any other agency responsible for proper food packaging and, storage practices. Participants were assured of their anonymity and confidentiality.

CHAPTER FOUR

FINDINGS AND DISCUSSION

4.1.1 Demographic Information on Respondents

The current findings represent the demographic information of respondents for the study.

Table 4.1: Category of food vendors

Category of respondents	Frequency	Percentages(%)
Waakye vendors	5	10
Gari and Beans vendors	5	10
Rice vendors	5	10
Roasted plantain vendors	5	10
Fish vendors	5	10
Kenkey/banku vendors	5	10
customers	20	40
Total	50	100

Table 4.1 speaks to the classification of respondents who participated in the study. Here, a quota of 5 respondents were given to each sampled food vendor. Ten percent (10%) were waakye vendors, 10% were Gari and Beans vendors; 10% were rice vendors; 10% were Roasted plantain vendors; 10% were fish vendors; 10% were Kenkey/Banku vendors while 40% were Customers.

Table 4.2 Background characteristics of respondent

Sex	Frequency	Percentages (%)
Female	41	82
Male	9	18
Total	50	100

Age	Frequency	Percentages
Lower than 30 years	19	38
30 – 50 years	25	50
50 and above	6	12
Total	50	100

Marital status	Frequency	Percentages
Single	22	44
Married	27	54
Widow/widower	1	2
Total	50	100

Religion	Frequency	Percentages
Muslim	11	22
Christian	36	72
Others	3	6
Total	50	100

Table 4.2 above represents the gender, age, marital status and religion of respondents in the study, 82% were females while 18% were males. The dominant female representation could be attributed to the dominant involvement of women in trading in Ghana. With respect to the age thirty-eight percent (38%) were less than 30 years; 50%

were within the age range of 30-50 years and 12% were 50 years and above. The ages of respondents were found to be in the working-class age bracket. In terms with the marital status of respondents, forty four percent (44%) were single; 54% were married while 2% were widow/widowers. The marital status of respondents indicated that most of the respondents were married and are responsible people who can adequately give responsive and detail opinion on alternatives food packaging material other than the use of plastics bags and the possible effect on the plastic bags on the environment. With respect to religion of respondents who partook in the study, twenty-two percent (22%) were Muslims; 72% were Christians while 6% were neither Christians nor Muslims.

Table 4.3: Educational Background of Respondents

Academic Qualification of Respondents	Frequency	Percentage %
No formal education	21	42
Middle School	14	28
WASCE	12	24
G.C.E 'O' And 'A' Level	1	2
3-Years Cert 'A' Post Sec	1	2
Diploma	1	2
Total	50	100

Table 4.3 indicates the academic qualification of the respondents. Out of 50 respondents, 42% had no formal education, 28% had Middle School Leaving Certificate; 24% had West African School Certificate, 2% of the total respondents had either GCE 'O' or 'A' level certificates, 2% had 3-years cert 'A' Post Secondary Certificates and 2% had diploma certificate. It could however be deduced that an average of 70% of the vendors have lower educational background.

Table 4.4: Examples of foods from respondents that can be packaged in Leaves

View on Product Packed in Leaves	Major Ingredient and Characteristics	Number of respondents
Kenkey	Maize	40
Waakye	Rice and Beans	38
Etsew	Corn Dough	40
Piiwa	Maize	35
Apapransa	Maize and palm Soup	37
Fish	Smoked, Dried and Fried	38
Gari And Beans	Cassava and Beans	33
Aboloo	Maize	39
Cooked Rice	Rice and Stew	38
Nkyekyeraa	Maize and groundnut	40

Table 4.7 indicates respondent's views on food items and their major ingredients which are usually packaged in leaves. An open face to face interaction was used to engage all the respondents to give their views. Here each respondent was allowed to give more than one view (hence the multiple responses).

Categorization was done based on the similarities of responses gathered and summarized. Forty(40) respondents mentioned kenkey; 38 respondents indicated Waakye, 40 respondents mentioned Etsew, 35 respondents mentioned Piiwa, 37 respondents indicated Apapransa, 38 respondents indicated Fish, 33 respondents indicated Gari and beans; 39 respondents mentioned Aboloo; 38 respondents indicated Cooked rice while 40 respondents stated nkyekyeraa.

In congruence with the responses gained, Roden, (1997) asserts that most traditional maize products consumed in southern Ghana are wrapped in leaves. Etsew (another form of fante kenkey) and 'agidi', which are wrapped while hot in plantain leaves and

the leaves of *Marantoclea spp.* respectively, can be stored for three days. Cooked rice and beans are stored in bulk in a large pan and sold wrapped in the leaves of *T. populnea*.

Table 4.5: Examples of foods packaged in Papers from respondents

View on products packed in papers	Major ingredient and characteristics	Number of respondents
Fish	Smoked, dry, fried	39
Bread	flour	40
Roasted plantain	Plantain	35
Roasted yam	Yam	36
Roasted maize	Maize	37
Pastries	Flour	40

Table 4.8 indicates respondent's views on food items which are usually packed in papers and the major ingredients. Here an open face to face interaction was used to engage all the respondents to give their view. With this each respondent was allowed to give more than one opinion (hence the multiple responses). Categorization was done based on the similarities of responses gathered and summarized. Thirty nine respondents (39) mentioned Fish, 40 respondents indicated Bread, 35 respondents mentioned Roasted Plantain, 36 respondents indicated roasted Yam, 37 respondents roasted Maize while 40 respondents indicated Pastries. This is in agreement with Robertson (2013) that paper is a secondary packaging material for some pre-packaged products such as kenkey.

Table 4.6: Examples of foods from respondents that are packaged in polythene bags

Examples of foods Packaged in Polythene Bags	Major Ingredient and Characteristics	Number of respondents
Cooked Rice	Rice And Stew	39
Water	Ice Water	38
Fish	Smoked, Dried, Fried	40
Sobolo	Bisap Leaves	30
Bread	Flour	35
Meat	Meat	36
Banku	Maize and cassava dough	40
Soup	Light Soup, Groundnut, Palm Nut	26
Waakye	Rice, Beans	37
Ahaie	Maize	29
Lemogin	Maize	31
Pastries	Flour	40
Porridge	Maize	40

Table 4.6 indicate respondents' views on food products packed in polythene bags. Again an open face to face interaction was used to engage all the respondent to give their opinion. With this each respondent was allowed to give more than one opinion (hence the multiple responses). Categorization was done based on the similarities of responses gathered and summarized. Thirty nine respondents 39 mentioned cooked rice, 38 respondents indicated water, 40 respondents indicated fish, 30 respondents

mentioned Sobolo, 35 respondents mentioned Bread, 36 respondents indicated Meat, 40 respondents mentioned Banku, 26 respondents indicated Soup, 37 respondents indicated Waakye, 29 respondents mentioned Ahaie, 31 respondents intimated Lemogin, 40 respondents indicated Pastries while 40 respondents mentioned porridge. This finding is similar to a study made by Gupta R. K & Dudeja P. (2017) which affirms the findings made from the research that plastic bags increase the shelf life and maintain the freshness of the product. More so, Items that are extremely moisture free can be stored in plastic bags for long.



Table 4.7: respondent's views on leaves and papers as packaging material

Statement	Number of respondents
Leaves are cheaper than the plastics	44
Leaves can be gotten anywhere and are more available	41
There is no problem with handling with leave, papers or plastics	36
plastics are harmful to health but it has come to stay	29
leaves have been in used for years now and it medicinal	49
leaves and papers are more preferable	40
the use of plastics could be banned so we can go back to the use of leave and papers	31
there should be more education on the dangers of plastic food packing so that people can resort to leaves and papers	50
more investment should be made into making leaves and papers available on the market for venders to buy to package foods	40

Table 4.7 indicate respondents' views on views on the possibilities of using leaves and papers as an effective packaging material other than plastic bags. Again an open face to face interaction was used to engage all the respondent to give their opinion. With this each respondent was allowed to give more than one opinion (hence the multiple responses). Categorization was done based on the similarities of responses gathered

and summarized. Forty-four (44) respondents indicated that Leaves are cheaper than the plastics, 41 respondents indicated that Leaves can be gotten anywhere and are more available, 36 respondents indicated that there is no problem with handling with leave, papers or plastics, 29 respondents indicated that plastics are harmful to health but it has come to stay, 49 respondents indicated that leaves have been in use for years now and it medicinal, 40 respondents indicated that leaves and papers are more preferable, 31 respondents indicated that the use of plastics could be banned so we can go back to the use of leave and papers; 50 respondents indicated that there should be more education on the dangers of plastic food packing so that people can resort to leaves and papers, 40 indicated that more investment should be made into making leaves and papers available on the market for vendors to buy to package foods. A research conducted by Robertson (2013) opposes this finding by explaining that for *Ga kenkey* the raw dough is incompletely wrapped in a single layer of maize sheaths with portions of the dough remaining exposed which may be lost in the water during cooking. Also, according to Selke (1994) products wrapped in leaves after cooking generally have a shelf-life of only two days.

Leks-Stepien (2011) explains that natural materials used for packaging production, such as paper and board, pose little risk to the environment or human health, this finding is in agreement to responses from about 58% of respondents of this study who indicated that plastics are harmful to human health.

4.3.4 Observations

It was observed that even though some people wish for their foods to be packed in leaves or paper, others perceived it to be old fashioned. More so, some respondents

really do not like to use plastics in food packaging yet they can also not help but patronize it. Hence the plastic bags have become an inevitable modern day canker.

Table 4.8 Responses on Source of Information on Food Packaging materials and health implications from respondents

Statement	Number of respondents
From television	21
On the radio	11
From relatives	48
From friends	34
From other traders	49
Food and drugs board	10
From parent	21
School	4
Self-taught	41
From dietician	2
Health official	2

Table 4.8 indicate respondents views on Source of Information on Food Packaging materials and health implications. Again an open face to face interaction was used to engage all the respondent to give their opinion. With this each respondent was allowed to give more than one opinion (hence the multiple responses). Categorization was done based on the similarities of responses gathered and summarized. 21 respondents indicated television; 11respondents indicated radio; 48 respondents mentioned

relatives; 34 respondents indicated friends; 49 respondents stated from other traders 10 respondents mentioned Food and drugs board 21 respondents from parents; 4 respondents mentioned that they got to know from school, 41 respondents mentioned were Self-taught; 2 stated dietician; 2 indicated Health official.

4.4.2 Observations

It was observed that most vendors have never attributed any illness to the plastic bags used to pack food items. Most of them believe that it is used everywhere and so it a normal practice.



Table 4.9: Respondents views on packaging material and health implications

Statement	Number of respondents
Packaging materials do not have any nutritional impact	41
Have no knowledge of packaging material on consumes health	32
Do not consider nutrition and health in the selection of packaging materials	32
Not aware of chemical reactions between packaging materials and food served	47
Do not know chemicals contained in the packing material and implications on health	48
Do not know packaging implication on food nutrient and the health of consumers	36
The packaging materials are for convenience sake and note for it health implication	48

Table 4.9 represent views on packaging material and health implications. Again an open face to face interaction was used to engage all the respondent to give their opinion. With this each respondent was allowed to give more than one opinion (hence the multiple responses). Categorization was done based on the similarities of responses gathered and summarized. 41 respondents indicated that packaging materials do not have any nutritional impact, 32 respondents mentioned that they have no knowledge of packaging material on consumes health, 32 respondents indicated that they do not consider nutrition and health in the selection of packaging materials;

47 respondents stated that not aware of chemical reactions between packaging materials and food served, 48 respondents mentioned that they do not know chemicals contained in the packing material and implications on health, 36 respondents stated that they do not know packaging implication on food nutrient and the health of consumers, 48 respondents indicated that packaging materials are for convenience sake and note for it health implication.

4.4.2 Observations

It was observed that most vendors have never attributed any illness to the plastic bags used to pack food items. Most of them believe that it is used everywhere and so it a normal practice.



Table 10: Views on effect of plastic packaging on the environment

Views on Environmental Impact of Refuse	*Frequency/50	Percentage%
Dump		
Unpleasant odour	50	100
Global warming	10	20
Air pollution	48	96
Groundwater contamination	42	84
Surface water contamination	48	96
Blockage of water flow in drainages leading to flooding, erosion	50	100
Attraction of Rodents, vultures and vector insects	44	88
Fire and explosions	15	30
Crop damage	35	70
Dirty environment	50	100
Soil contamination (toxins, metals, nutrients) - potential to convey heavy metals to the soil.	21	42

Table 10 represents Community member's views on environmental impact of refuse dump. To obtain data an open face to face interaction was used to engage all the respondent to give their opinion. With this each respondent was allowed to give more than one opinion (hence the multiple responses). Categorization was done based on the similarities of responses gathered and summarized each of the categories over hundred

percent. Out of 50 respondents, 100% indicated that refuse dump causes unpleasant odour, 20%, indicated that refuse dump causes global warming, 96%, indicated that refuse dump causes air pollution; 84% mentioned groundwater contamination, 96% indicated that refuse dump causes surface water contamination; 100% indicated that refuse dump causes blockage of water flow in drainages leading to flooding and erosion, 88% indicated that refuse dump attract rodents, vultures and vector insects, 30% indicated that refuse dump causes fire and explosions, 70% mentioned that refuse dump causes crop damage, 100% indicated that refuse dump causes dirty environment; 42% indicated that refuse dump causes soil contamination (toxins, metals, nutrients) - potential to convey heavy metals to the soil.

4.5.2 Health Implications of plastic waste

Table 4.11: respondent's views on plastic waste and impact on human health

Statement	Frequency	Percentages%
Foul odor and unsightliness	50	100
Gastrointestinal parasite (worms)	45	90
Typhoid fever	48	96
Cholera	49	98
Malaria	41	82
Skin irritation	32	64
Eye irritation	29	58
Respiratory tract infection – cough	40	80

Table 4.11 represents respondent's views on health implications of improper waste disposal. With this an open face to face interaction was used to engage all the

respondent to give their opinion. With this each respondent was allowed to give more than one opinion (hence the multiple responses). Categorization was done based on the similarities of responses gathered and summarized each of the categories over hundred percent. One hundred percent 100% indicated that poor plastic waste breed foul odor and unsightliness; 90% indicated Gastrointestinal parasite (worms); 96% indicated Typhoid fever; 98% indicated Cholera; 82% indicated Malaria; 64% indicated Skin irritation; 58% indicated Eye irritation whilst 80% indicated Respiratory tract infection – cough.

4.5.3. Observations

It was observed that the most of the gutters in the market centre are choked and most surprisingly most of the food vending are found along the road where most of these choked gutters could be found. Again aside those who wish that their items are packed in plastic bags other buy and site around and eat as well.

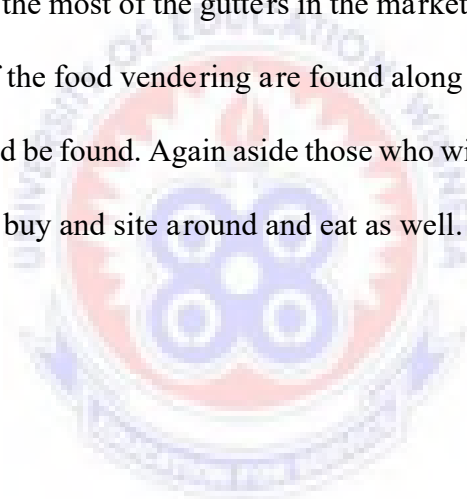


Table 4.12: Views on people’s attitude towards plastic waste disposal

View on attitude and most frequent excuse towards plastic waste disposal	Frequency	Percentages%
Government should collect waste not individuals	48	96

People are paid to collect waste	50	100
Everybody thinks somebody should do it	39	78
The drain will sweep it away	41	82
There are no available bin around here syndrome	44	88
I can't carry rubbish till I get a bin to dispose it syndrome	38	76
Ignorance on the dangers of refuse disposal	37	74
Everybody throw rubbish around so why can't I	48	96
Laziness	40	80

Table 4.12 shows respondent's views on attitude towards plastic waste disposal. With this an open face to face interaction was used to engage all the respondent to give their opinion. With this each respondent was allowed to give more than one opinion (hence the multiple responses). Categorization was done based on the similarities of responses gathered and summarized each of the categories over hundred percent. Ninety six (96%) indicated that people perceived that the Government should collect waste not individuals; 100% indicated that people perceived that the People are paid to collect waste; 78% indicated that people perceived that Everybody thinks somebody should do it; 82% indicated that people perceived that the drain will sweep it away; 88% indicated that people perceived that the there are no available bin around here syndrome; 76% indicated that people perceived that people find it difficult to carry rubbish till they get a bin to dispose it syndrome; 74% indicated that most people were Ignorant on the dangers of refuse disposal; 96% indicated that people perceived that Everybody throw rubbish around so why can't they while 80% representing indicated laziness.

4.6.2 Perceptions on How Waste was Disposed

Table 4.13: attitude on how plastic packaging waste are disposed

Views on how waste are disposed	Frequency	Percentages%
Street bins	49	98
Dumpsite	24	48
Bury or Burn pits	42	84
In bags	35	70
In drains or streets	36	72
Dustbins containers	50	100

Table 4.13 represents perception on how waste are disposed. With this an open face to face interaction was used to engage all the respondent to give their opinion. With this each respondent was allowed to give more than one opinion (hence the multiple responses). Categorization was done based on the similarities of responses gathered and summarized each of the categories over hundred percent. 98 % throw their waste into street bins, 48% throw their waste into dumpsite, 84% indicated that they throw their waste into burn pits, 70% indicated that they keep their waste in bags, 72% indicated that they throw their waste into drains or on the streets; 100% indicated that they throw their waste into dustbins containers.

4.6.3 Observations

It was observed that even though waste bins are provided by the assembly at certain places people still throw rubbish around. Here, instead of putting the rubbish in the container they rather put it on the floor. It was also observed that most vender do not sweep after selling thinking that the assembly will sweep which does not happen

sometimes. That is, the assembly sometimes come late by the time the wind had blown scattered the plastic waste around.

4.7 Development of Themes for the study

To ensure effective discussion of the finding of the study, themes were derived from the objectives to aid discussion of the finding of the study. With this, sub-themes were further developed to discuss the finding of the study. The discussion was done in consonance to the previous related studies. The themes were presented in tabular format to aid the discussion as follows:

Discussions of The Study

This section presented significant findings, interpreted and discussed the result in relation to the themes developed from the objectives. The discussion highlighted the major findings of the research and the inferences made from related previous studies.

4.8.1 Theme 1: The possibilities of using leaf and paper to package food by food vendors other than plastic materials

The research revealed that Polythene bags are now widely used as a major form of packaging materials within the district. Again these bags comes in difference sizes and shapes. The study observed that polythene bags are very affordable and manageable which could be used for any form of packaging. The study also revealed that the most predominate food packaging materials for used by the vendors was plastic bags even though other materials like paper and leaves are sometimes used. Here the food items they use the plastics to package range from solid to liquid food items as shown in table 4.9 above. Robertson, (2013) indicated that Ideally, a food package would consist of materials that maintain the quality and safety of the food over time; are attractive, convenient, and easy to use while conveying all the desired information; are made from renewable resources, thereby generating no waste for

disposal; and are inexpensive. Rarely, if ever, do today's food packages meet these lofty goals. Creating a food package is as much art as science, trying to achieve the best overall result without falling below acceptable standards in any single category. The study found that the one of the possible ways to shun from the use of plastic bags as a packaging material was to employ stringent measure such as banning its sales and importation. As indicated in table 4.10 about 62% of the respondents registered their displeasure about the rampant use of the plastic bags and expressed their interest in going back to use leaves.

Again the research also revealed that another possible means of avoiding plastic as a packaging material due to its harmful content was to engage in more education on the dangers of plastic food packaging so that people can resort to leaves and papers. This has become necessary because studies have shown that many vendors expose their products to the sun while sealed in the plastic bags. Moisture condenses inside the bags, and this facilitates mould growth. Sometimes air is blown into bags with the mouth to open them. This introduces vapour and micro organisms, which sets the stage for spoilage when foods are placed in the bags (Mead, 1997). Some vendors package vegetables such as carrots, cabbages, and tomatoes in polythene bags with tied ends. This speeds the rate of deterioration since the exchange of moisture and gas with the atmosphere is cut off. Heavier-weight polyethylene film wraps have limited application for street foods except for bulk packaging, or covering such items require heat and moisture to be retained (Robertson, 2013).

4.8.2 Theme 2: Vendors knowledge of plastic packaging materials and health implications

The research found that respondents' source of information on food packaging materials was not authoritative or not from any approved nutritional mandated

institution which check the risk in food handling practices. Only about 20% could indicate Food and Drugs Board. Most of them indicated friends, parents and friends which could be based on assumption and hear say. Pienaar (2015) researched that Africa has the most arable land suited to farming of any continent, meaning that with the right packaging and supply chain knowledge, and achieving population forecasts for 2050, African countries should be able to export across the globe. He added that the 'open markets' sell practically every possible household goods in small size sachets consisting literally of only one day supply of the product. This is purely driven by cost and affordability.

The responses in table 4.11 above indicate that respondents lack basic nutritional knowledge that come with food packaging. About 80% on the average are not aware of the health implications of the packaging material or the storage practices on food nutrient and its implications on consumer's health. About 90% merely asserted that plastic bags are used for convenience with no recourse to it nutritional benefit or disadvantage. This confirm the studies by Stillwell & Tibbs (1991) that the two most common factors leading to causes of bacterial food borne illness are cross-contamination of ready-to-eat food from other uncooked foods and improper temperature control. Less commonly, acute adverse reactions can also occur if chemical contamination of food occurs, for example from improper package material, or use of non-food grade soaps and disinfectants.

Grobet al. (2006) suggest that the amount of material migrating from food packaging into food may well be 100 times higher than that from pesticides or environmental pollutants. Many of the public perceptions about food safety are skilfully manipulated and exploited by food marketers. Fear of food contamination has led to a widespread preference for what are seen as 'natural' processes as evidenced by the growth of

organic agriculture and the increasing preference for bottled water as a beverage of choice.

4.8.3 Theme 3: Perception on the use of plastic materials in packaging foods and its impact on Environment

The research found that about 90% of the respondents could identify with some health related danger as a result of improper disposal of plastic waste. It was observed that though the menace of improper disposal of refuse has become a canker in the community, its devastating effect is far reaching claiming lives and properties. It was observed that because of the insufficient service coverage by the municipal assembly to collect waste, the uncollected plastic waste are often dumped into drains, rivers and surrounding areas. These practices lead to considerable environmental pollution, unpleasant odour and degradation, blockage of water flow in drainages leading to flooding, erosion and these poses serious health risk to the residence such as typhoid and cholera. The practice of improper plastic disposal has a bad effect on the environment. However, according to Ofori (2010) and Ameyaw (2000). Environmental hygiene is sanitary science and an element of food safety which considers the environment, necessary conditions in controlling hazards to ensure the survival of living things. They further indicated that it takes into account activities such as solid waste collection and liquid waste disposal, cleaning and sanitizing, water supply, pest control in reducing food contamination, food spoilage and foodborne illness. This involves improving and maintaining basic conditions and standards in the protection of food from biological, physical or chemical contaminants, clean but safe surroundings for ambient air.

It was observed that even though the community people and the vendors are aware of these consequences they practice of throwing plastic waste on the street still persist. Research posit that the environment is a major consideration in planning for health, sanitation and food safety. There is the need therefore to assess the environmental situation of the food preparation and vending sites to identify environmental challenges which acts as constraints to development (Schmdit and Rodrick 2003).

4.8.4 Theme 4: Attitudes, perceptions and effect of plastic waste disposals

The study also revealed most of the waste identified were plastics solid waste as a result of it been used as a packed material which has been disposed after use. It was obvious that the major waste disposal canker in the community was the attitude of the people. It was recounted by one of the respondent that: *People litter about, they just throw litter anywhere whilst the containers are there, they put the waste on the ground expecting that the municipal assembly officials will come and pick*". As indicated in table 4.15 above both consumers and the food venders attributed that most of the plastic bags find their way on the street due to bad attitude and perception on waste disposal. The research revealed that the major environmental problem has to do with *"this is what we have been doing"* syndrome, coupled with bad attitude towards waste disposal is a major cause of improper disposal of waste. It was noted that though the waste management agencies are doing their best to bring the menace of waste disposal under control, public perception and attitude still compound the problem.

The research identified that, majority of respondents were ignorant of the dangers of improper waste disposal, thus they therefore resort to littering their surroundings.

Despite the importance of adequate solid waste management to the urban environment, the performance of many city authorities in this respect leaves much to

be desired. It is however sad to identify that community members assume that waste thrown on the streets would be picked up by the municipality through street sweeping. For the general public, which is quite indifferent towards garbage disposal protocol, the responsibility of keeping the city clean is entirely on the government. Table 4.12 represents people's attitude of waste disposal.

The research found that people have different means of how they dispose off their waste as indicated in Table 4.13. These practices could possibly be linked with respondent's perception of waste management. To affirm this studies have shown that the perception of one's capability is said to set a limit to what to do and ultimately what can be achieved (Holland & Rosenberg, 1996). The influence of perception which describes how a person views himself and the world around him and how it tends to govern behaviour is explained by Anomie theory (Merton, 1968). A situation that may result is greater incidence of divergent behaviour's towards Solid Waste Management services as perceived or a total breakdown of waste control system. In this wise, individual's perception will influence the cultural values, responses, and success of the solid waste management system. Hence, people's perception on waste disposal and on waste collection services is primordial for its willingness to comply.

The research gathered that though with the provision of bins and containers for waste collection some community members still throw their rubbish into street and gutter, a practice they claimed is perpetuated at night. In effect, this wayward rubbish eventually finds its way into gutters blocking major flow of water in the capital causing severe damage to properties and lives.



CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.2 Conclusion

The study also concluded that leaf and paper could be used as packaging material since consumers did not have any particular packaging material preference.

Most vendors possess some basic knowledge on food packaging materials they virtually lack proper standards as to the chemical composition and the dangers of plastic bags of the nutrition and on human health.

It was concluded that vendors' purpose of material choice was not based on any scientific research or medical analyses to ascertain the impact of the material on the food nutrient or health implications of the material choice which possibly could be linked with respondent's high rate of illiteracy and lack of proper nutritional education. The research concluded that these plastic after been used serves as a major material for environmental hazard such as air and land pollution which poses danger to human life and plants. It was also concluded that respondents think it is the sole responsibility of the government to manage plastic waste in the municipality.

5.3 Recommendations

Based on the findings of this research work, it is recommended that in order to ensure that proper packing material with human and environment hazard free is used the following could be useful:

1. Alternative packaging materials like leaves and papers should be encouraged and be made more available and affordable so that local food vendors to use to avoid over reliance on plastic bags.
2. Education should be made to sensitize food vendor on the health implication on the use of plastic bags as packaging materials .
3. Food vendors should be given enough training regularly to resort to more bio degradable and environmental friendly material like paper and leaves for the safety of the environment and human health
4. Community members and vendors should be given continuous education on the dangers of these plastics used as packaging material and it effect on the very environment they live.

5. It is also recommended that the municipal assembly should make bins available for appropriate waste disposal
6. The general public should be given education to resort to biodegradable and environmental friendly material like paper and leaves for the safety of the environment
7. Reusable containers should also be encouraged to reduce the use of disposable plastic bags.
8. The district assembly and the local unions should organize health seminars and screening on healthy life style through proper food packaging strategies that will embrace proper packaging materials that has minimal hazard like leaves and papers.



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APPENDIX

UNIVERSITY OF EDUCATION, WINNEBA

DEPARTMENT OF HOSPITALITY

QUESTIONNAIRE ON LEAF AND PAPER AS AN ALTERNATIVE FOR PLASTIC PACKAGING

This research aims to seek information on using leaf and paper as an alternative for packaging food rather than plastic products. The information is needed strictly for academic work. All responses would be held in strict confidence. Your full co-operation is needed. Thank you

SECTION A: PERSONAL DATA

1. AGE RANGE (YEARS)

LOWER THAN 30 [] 30 - 50 [] 50 AND ABOVE []

2. SEX

FEMALE [] MALE []

3. TYPE OF FOOD SOLD

FISH [] ROASTED PLANTAIN [] RICE [] WAAKYE [] GARI AND BEANS []
BANKU/KENKEY []

4. EDUCATIONAL BACKGROUND

ILLITRATE [] MIDDLE SCHOOL [] SHS [] JHS [] OTHER []

5. NUMBER OF YEARS IN THE TRADE

ONE MONTH – SIX MONTHS [] SIX MONTHS – ONE YEAR [] ONE YEAR- FIVE YEARS []
OTHER []

6. MARITAL STATUS

SINGLE [] MARRIED [] WIDOW/ WIDOWER []

7. RELIGION

CHRISTIAN [] MUSLIM [] OTHER []

SECTION B: PART I

POSSIBILITY OF USING PAPER AND LEAF TO PACKAGE FOODS.

8. What are some of the foods that can be packaged in leaf?

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.....
.....

9. What are some of the foods that can be packaged in paper?

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.....

10. What are some of the foods that can be packaged in polythene bag?

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11. If you are asked to change the plastic bags and use other materials to package the food, which of the following materials would u choose? Paper [] leaf [] aluminum []

12. Why did you choose the option in question 11?

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13. In what way can leaf and paper be a permanent material for packaging in Ghana?

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SECTION B: PART II

KNOWLEDGE OF FOOD VENDORS ON THE HEALTH IMPLICATION OF FOOD PACKAGED
IN PLASTIC PRODUCTS

14. What happens when you wrap hot food in polythene bag?

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.....

15. What happens when people eat food wrapped in polythene bag?

.....
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.....

16. Have you ever heard of any disease or sickness that can affect customers who eat in a plastic bag? Yes [] No []

17. If yes to question 16, what are some of the diseases you heard or know of that can affect those who eat from plastic bags?

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SECTION B: PART III

KNOWLEDGE OF FOOD VENDORS ON THE EFFECT OF PLASTIC BAGS ON THE
ENVIRONMENT

18. How do you see the environment you find yourself in terms of cleanliness?

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19. What are the things or materials that make up the rubbish in the market or at the lorry station?

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20. What happens when it rains heavily in?

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21. In your opinion what do you think the plastic products used to package food do to the environment after using them?

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.....



UNIVERSITY OF EDUCATION, WINNEBA

DEPARTMENT OF HOSPITALITY

QUESTIONNAIRE ON LEAF AND PAPER AS AN ALTERNATIVE FOR PLASTIC PACKAGING

This research aims to seek information on using leaf and paper as an alternative for packaging food rather than plastic products. The information is needed strictly for academic work. All responses would be held in strict confidence. Your full co-operation is needed. Thank you

SECTION A: PERSONAL DATA

1. AGE RANGE

LOWER THAN 30 [] 30 - 50 [] 50 AND ABOVE []

2. SEX

MALE [] FEMALE []

3. EDUCATIONAL BACKGROUND

ILLITRATE [] MIDDLE SCHOOL [] SHS [] JHS [] OTHER []

SECTION B: PART I

PERCEPTIONS AND ATTITUDE OF CONSUMERS PLASTIC WASTE DISPOSAL.

1. How do you dispose rubbish off?

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2. Who is responsible for waste collection?

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.....

3. Why do some people litter around?

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4. What are some of the foods that can be packaged in leaf?

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5. What are some of the foods that can be packaged in paper?

.....
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6. What are some of the foods that can be packaged in polythene bag?

.....
.....
.....

7. If you are asked to change the plastic bags and use other materials to package the food, which of the following materials would u choose? Paper [] leaf [] aluminum []

8. Why did you choose the option in question 11?

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.....

9. In what way can leaf and paper be a permanent material for packaging in Ghana?

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OBSERVATION GUIDE

1. Food packaging material used by food vendors

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2. Hygienic state of the vending site

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3. Consumers preference to a particular packaging material

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4. Number of plastic bags used in packaging food

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